YAESU

Dual Band FM Transceiver

FT-8800R

Technical Supplement

 (EH018M90A)

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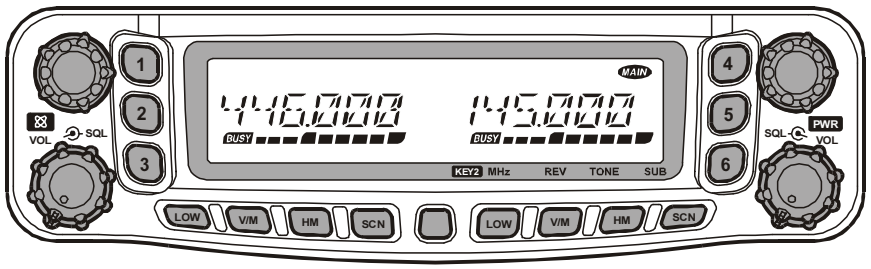


Introduction

This manual provides technical information necessary for servicing the FT-8800R Transceiver.

Servicing this equipment requires expertise in handling surface-mount chip components. Attempts by non-qualified persons to service this equipment may result in permanent damage not covered by the warranty, and may be illegal in some countries.

Two PCB layout diagrams are provided for each double-sided circuit board in the transceiver. Each side of thr board is referred to by the type of the majority of components installed on that side (“leaded” or “chip-only”). In most cases one side has only chip components, and the other has either a mixture of both chip and leaded components (trimmers, coils, electrolytic capacitors, ICs, etc.), or leaded components only.

While we believe the technical information in this manual to be correct, Vertex Standard assumes no liability for damage that may occur as a result of typographical or other errors that may be present. Your cooperation in pointing out any inconsistencies in the technical information would be appreciated.

Contents

Specifications

General

Frequency Range:	RX:	108.000 - 520.000 MHz, 700.000 - 999.995 MHz (Cellular Blocked)
	TX:	144.000 - 146.000 MHz (or 144.000 - 148.000 MHz), 430.000 - 440.000 MHz (or 430.00 - 450.000 MHz)
Channel Steps:	5/10/12.5/15/20/25/50 kHz	
Modes of Emission:	F3, F2	
Antenna Impedance:	50-Ohms, unbalanced (Antenna Duplexer built-in)	
Frequency Stability:	±5 ppm @ 14° F ~ +140° F (–10 °C ~ +60 °C)	
Operating Temperature Range:	–4° F ~ +140° F (–20 °C ~ +60 °C)	
Supply Voltage:	13.8 VDC (±15%), negative ground	
Current Consumption (Approx.):	RX: 0.5 A (Squelched) TX: 8.5 A (144 MHz), 8.0 A (430 MHz)	
Case Size (W x H x D):	5.5" x 1.6" x 6.6" (140 x 41.5 x 168 mm) (w/o knobs & connectors)	
Weight (Approx.):	2.2 lb (1 kg)	

Transmitter

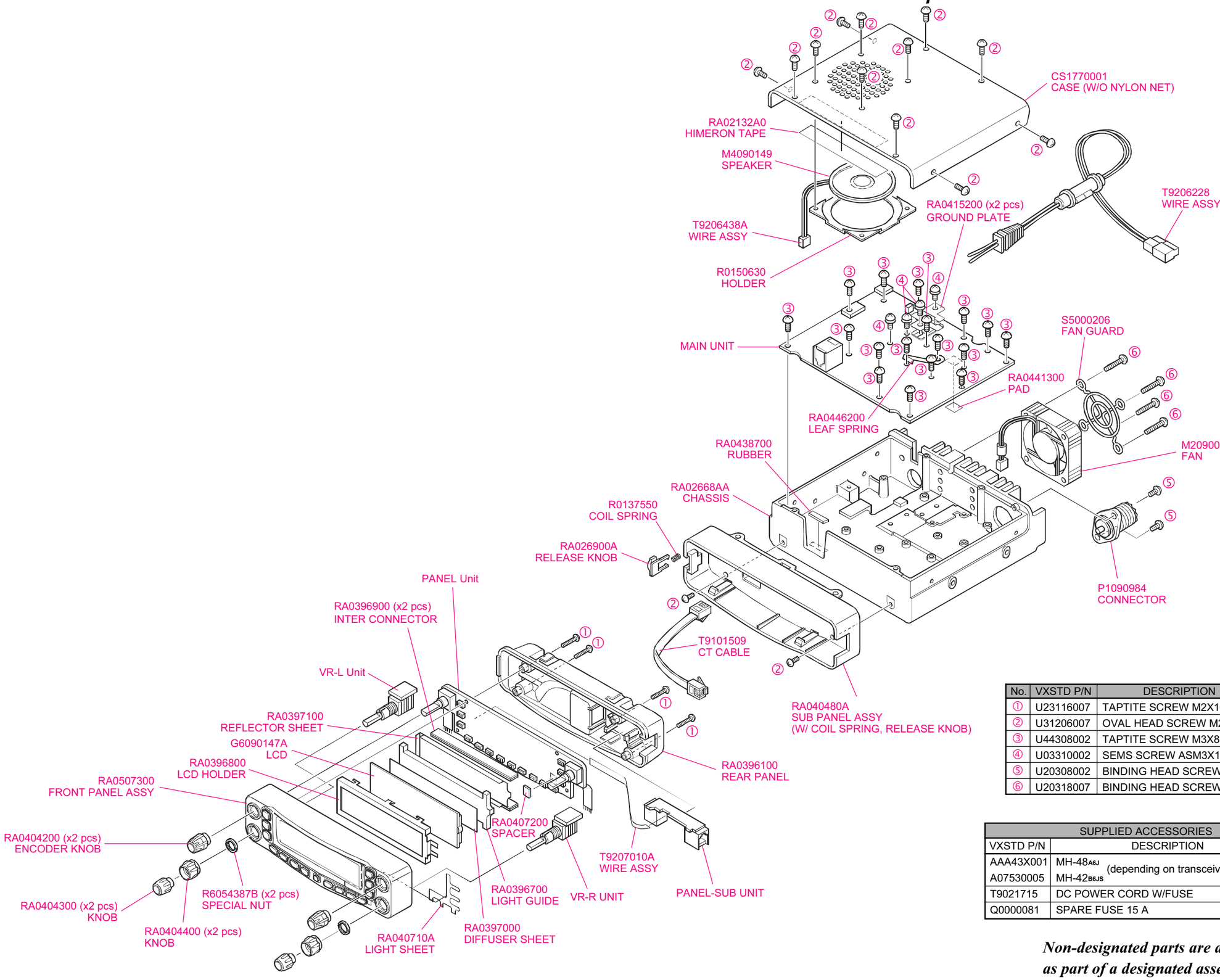
Output Power:	50/20/10/5 W (144 MHz), 35/20/10/5 W (430 MHz)
Modulation Type:	Variable Reactance
Maximum Deviation:	±5 kHz
Spurious Radiation:	Better than –60 dB
Microphone Impedance:	2 kΩ
DATA Jack Impedance:	10 kΩ

Receiver

Circuit Type:	Double-conversion superheterodyne
Intermediate Frequencies:	45.05 MHz/450 kHz (Main band), 47.25 MHz/450 kHz (Sub band)
Sensitivity (for 12dB SINAD):	Better than 0.2 μV
Squelch Sensitivity:	Better than 0.16 μV
Selectivity (–6dB/–60dB):	8 kHz/30 kHz
Maximum AF Output:	2 W @ 8 Ω for 5% THD
AF Output Impedance:	4-16 Ω

Specifications are subject to change without notice, and are guaranteed within the 144 and 430 MHz amateur bands only. Frequency ranges will vary according to transceiver version; check with your dealer.

Exploded View & Miscellaneous Parts



No.	VXSTD P/N	DESCRIPTION	QTY.
①	U23116007	TAPTITE SCREW M2X16B	4
②	U31206007	OVAL HEAD SCREW M2.6X6B	14
③	U44308002	TAPTITE SCREW M3X8NI	17
④	U03310002	SEMS SCREW ASM3X10NI	4
⑤	U20308002	BINDING HEAD SCREW M3X8NI	2
⑥	U20318007	BINDING HEAD SCREW M3X18B	4

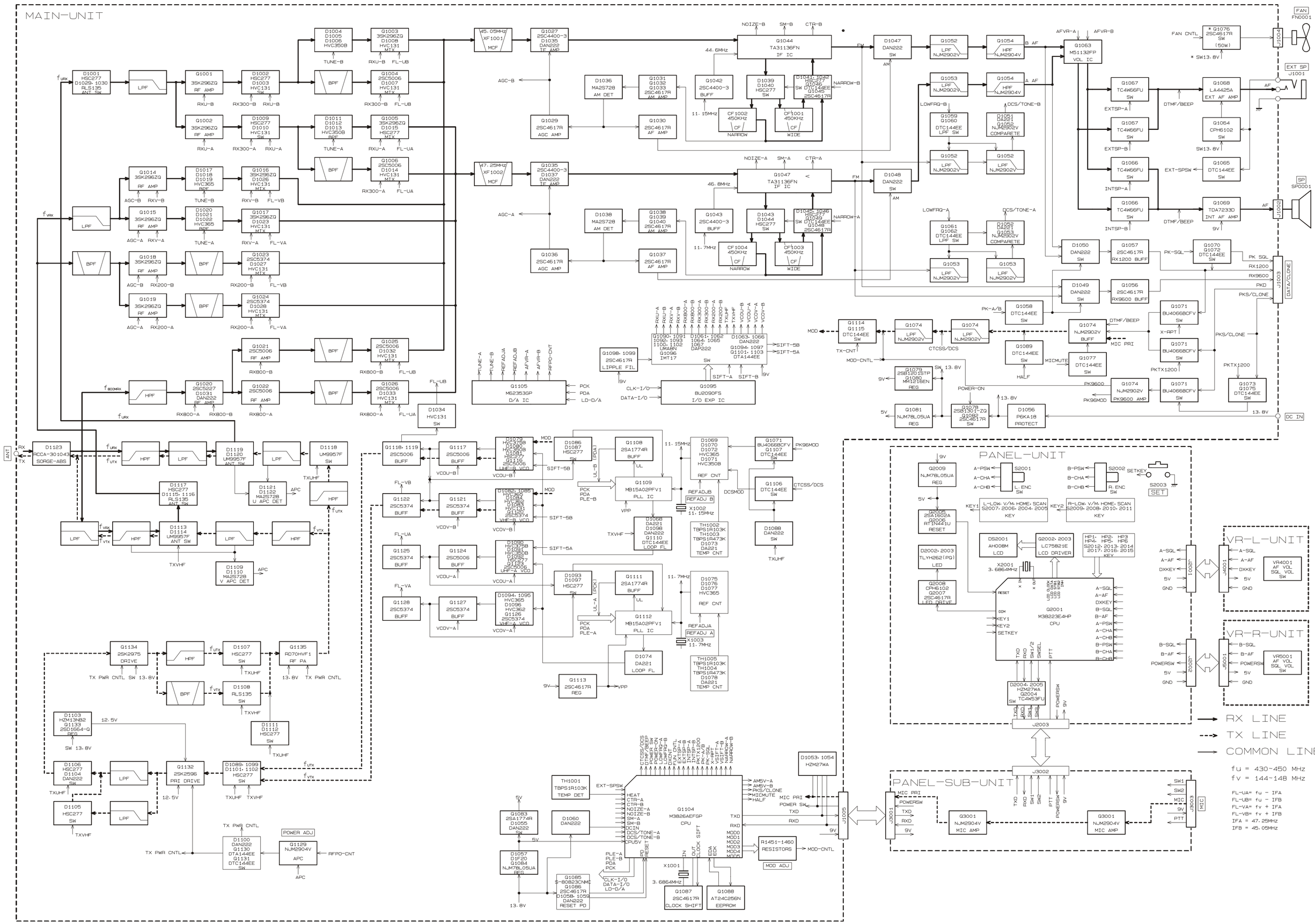
SUPPLIED ACCESSORIES		
VXSTD P/N	DESCRIPTION	QTY.
AAA43X001 A07530005	MH-48$_{A6J}$ MH-42$_{B6JS}$ (depending on transceiver version)	1
T9021715	DC POWER CORD W/FUSE	1
Q0000081	SPARE FUSE 15 A	2

Non-designated parts are available only as part of a designated assembly.

Exploded View & Miscellaneous Parts

Note:

Block Diagram



Block Diagram

Note:

Receiver Signal Path

"Main" Band 430 MHz Signal

The 430 MHz signal is passed through a high-pass filter network and a low-pass filter network to the antenna switch diodes **D1029, D1030** (both **RSL135**) and **D1001** (**HSC277TRF**), then passed through another low-pass filter network to the "Main" band RF amplifier **Q1001** (**3SK296ZQ**).

The amplified 430 MHz signal is passed through the band switch **D1002** (**HSC277**) to the varactor-tuned band-pass filter network consisting of **D1004**, **D1005**, and **D1006** (all **HVC350B**) and associated circuitry, then applied to the first mixer **Q1003** (**3SK296ZQ**). Meanwhile, the UHF local signal from the UHF-VCO/B **Q1116** (**2SC5006**) is delivered to first mixer **Q1003**, yielding the 45.05 MHz "Main" band first IF.

"Main" Band 144 MHz Signal

The 144 MHz signal is passed through a low-pass filter network and a high-pass filter network to the antenna switch diodes **D1113, D1114** (both **UM9957F**), **D1115**, **D1116** (both **RLS135**) and **D1117** (both **RLS135**) then passed through another low-pass filter network to the "Main" band RF amplifier **Q1014** (**3SK296ZQ**).

The amplified 144 MHz signal is passed through a varactor-tuned band-pass filter network consisting of **D1017**, **D1018**, **D1019** (all **HVC365**) and associated circuitry to the first mixer **Q1016** (**3SK296ZQ**). Meanwhile, the VHF local signal from the VHF-VCO/B **Q1120** (**2SC5374**) is delivered to first mixer **Q1016**, yielding the 45.05 MHz "Main" band first IF.

"Main" Band IF and AF Signals

The 45.05 MHz "Main" band first local signal is delivered to the monolithic crystal filter **XF1001** which strips away unwanted mixer products, then is passed through IF amplifier **Q1027** (**2SC4400**) to the IF IC **Q1044** (**TA31136FN**).

Meanwhile, a portion of the output of 11.15 MHz crystal **X1002** is multiplied fourfold by **Q1042** (**2SC4400**) to provide the 44.6 MHz second local signal, then delivered to the IF IC **Q1044**. Within the IF IC **Q1044**, the 44.6 MHz second local signal is mixed with the 45.05 MHz "Main" band first local signal to produce the 450 kHz "Main" band second IF.

The 450 kHz "Main" band second IF is passed through the filter switch **D1039**/**D1041** (both **HSC277**) to the ceramic filter **CF1001** (**CFWM450E**) which strips away all but the desired signal, then it passes through the IF amplifier within Q1044 to the ceramic discriminator **CD1001** (**CDBM450C24**), which removes any amplitude variations in the 450 kHz IF signal before detection of speech.

The demodulated "Main" band audio is passed through the de-emphasis network, audio switch **D1047** (**DAN222**), low-pass filter network (consisting of **Q1052** (**NJM2902V**) and associated circuitry), and a high-pass filter network (consisting of **Q1054** (**NJM2904V**) and associated circuitry). The filtered audio signal is passed through the audio volume control IC **Q1063** (**M51132FP**), which adjusts the audio sensitivity to compensate for audio level variations, then is delivered to the audio switch **Q1066** and **Q1067** (both **TC4W66FU**).

When the internal speaker is selected, the audio signal is amplified by **Q1069** (**TDA7233D**) then applied to the internal loudspeaker. When the external speaker is selected, the audio signal is amplified by **Q1068** (**LA4425A**), then it passes through the **EXT SP** jack to the external loudspeaker.

"Sub" Band 430 MHz Signal

The 430 MHz signal is passed through a high-pass filter network and a low-pass filter network to the antenna switch diodes **D1029, D1030** (both **RSL135**) and **D1001** (**HSC277TRF**), then passed through another low-pass filter network to the "Sub" band RF amplifier **Q1002** (**3SK296ZQ**).

The amplified 430 MHz signal is delivered through the band switch **D1009** (**HSC277**) to the varactor-tuned band-pass filter network consisting of **D1011**, **D1012**, **D1013** (all **HVC350B**) and associated circuitry, then applied to the first mixer **Q1005** (**3SK296ZQ**). Meanwhile, the UHF local signal from the UHF-VCO/A **Q1123** (**2SC5006**) is delivered to first mixer **Q1005**, yielding the 47.25 MHz "Sub" band first IF.

"Sub" Band 144 MHz Signal

The 144 MHz signal is passed through a low-pass filter network and a high-pass filter network to the antenna switc diodes **D1113, D1114** (both **UM9957F**), **D1115**, **D1116** (both **RLS135**) and **D1117** (both **RLS135**), then passed through another low-pass filter network to the "Sub" band RF amplifier **Q1015** (**3SK296ZQ**).

The amplified 144 MHz signal is passed through the varactor-tuned band-pass filter network consisting of **D1020**, **D1021**, **D1022** (all **HVC365**) and associated circuitry to the first mixer **Q1017** (**3SK296ZQ**). Meanwhile, the VHF local signal from the VHF-VCO/A **Q1126** (**2SC5374**) is delivered to first mixer **Q1017**, yielding the 47.25 MHz "Sub" band first IF.

"Sub" Band IF and AF Signal

The 47.25 MHz "Sub" band first IF is delivered to the monolithic crystal filter **XF1002** which strips away unwanted mixer products, then passed through the IF amplifier **Q1035** (**2SC4400**) to the IF IC **Q1047** (**TA31136FN**).

Meanwhile, a portion of the output of 11.7 MHz crystal **X1003** is multiplied fourfold by **Q1043** (**2SC4400**) to provide the 46.8 MHz second local signal, then applied to the IF IC **Q1047**. Within the IF IC **Q1047**, the 46.8 MHz second local signal is mixed with the 47.25 MHz "Sub" band first local signal to produce the 450 kHz "Sub" band second IF.

The 450 kHz "Sub" band second IF is delivered to the ceramic filter **CF1003** (**CFWM450E**) which strips away all but the desired signal, then passed through the IF amplifier within **Q1047** to the ceramic discriminator **CD1002** (**CDBM450C24**) which removes any amplitude variations in the 450 kHz IF signal before detection of speech.

The demodulated "Sub" band audio is passed through the de-emphasis network, audio switch **D1048** (**DAN222**), low-pass filter network (consisting of **Q1053** (**NJM2902V**) and associated circuitry) and the high-pass filter network (consisting of **Q1054** (**NJM2904V**) and associated circuitry). The filtered audio signal is passed through the audio volume control IC **Q1063** (**M511312FP**), which adjusts the audio sensitivity to compensate for audio level variations, then is delivered to the audio switch **Q1066** and **Q1067** (both **TC4W66FU**).

When the internal speaker is selected, the audio signal is amplified by **Q1069** (**TDA7233D**) then applied to the internal loudspeaker. When the external speaker is selected, the audio signal is amplified by **Q1068** (**LA4425A**), then it passes through the **EXT SP** jack to the external loudspeaker.

Squelch Control

"Main" Band

When no carrier is being received on the "Main" band, noise at the output of the detector stage in **Q1044** is amplified and band-pass filtered by the noise amp section of **Q1044**. The resulting DC voltage is delivered to pin 5 of main CPU **Q1104** (**M38268MCL**), which compares the squelch threshold level to that which set by the front panel **SQL** knob.

While no carrier is being received on the "Main" band, pin 2 of **Q1105** remain "low," to disable the audio output from the speaker.

"Sub" Band

When no carrier is being received on the "Sub" band, noise at the output of the detector stage in **Q1047** is amplified and band-pass filtered by the noise amp section of **Q1047**. The resulting DC voltage is delivered to pin 2 of main CPU **Q1104**, which compares the squelch threshold level to that which set by the front panel **SQL** knob.

While no carrier is being received on the "Right" band, pin 15 of **Q1105** remain "low," to disable the audio output from the speaker.

Transmitter Signal Path

AF Signal

The speech signal from the microphone is passed through the **MIC** jack **J3003** to the AF amplifier **Q3001** (**NJM2904V**) on the PANEL-SUB UNT. The amplified speech signal is passed through the panel separation jacks **J3001** and **J1005** to the MAIN Unit. On the MAIN UNIT, the speech signal is delivered to the limiting amplifier **Q1074** (**NJM2902V**) to prevent over-modulation, then is delivered to a low-pass filter network consisting of **Q1074** and associated circuitry.

430 MHz Signal

The adjusted speech signal from **Q1074** is passed through transistor switch **Q1114, Q1115** (both **DTC144EE**) to varactor diodes **D1079** (**HVC375B**) and **D1080** (**HVC350B**), which frequency modulate the transmitting VCO, made up of UHF-VCO/B **Q1116** (**2SC5006**) and **D1081** (**HSC277**).

The modulated transmit signal is passed through buffer amplifiers **Q1117, Q1118** and **Q1119** (all **2SC5006**) and diode switches **D1099, D1101** (both **HSC277**) to the predrive amplifier **Q1132** (**2SK2596**).

The amplified transmit signal from **Q1132** is passed through diode switch **D1106** (**HSC277**) and the driver amplifier **Q1134** (**RD07MVS1**) to the diode switch **D1107** (**HSC277**), then finally amplified by power amplifier **Q1135** (**RD70HVF1**), providing up to 35 Watts of power output. These three stages of the power amplifier's gain are controlled by the APC circuit.

The 35-Watt RF signal is passed through a high-pass filter network to the antenna switch **D1118**, **D1119**, and **D1120** (all **UM9957F**), then passed through a low-pass filter network and another high-pass filter network to the ANT jack.

144 MHz Signal

The adjusted speech signal from Q1074 is passed through the transistor switch **Q1114, Q1115** (both **DTC144EE**) to varactor diodes **D1082** and **D1085** (both **HVC365**), which frequency modulate the transmitting VCO, made up of VHF-VCO/B **Q1120** (**2SC5374**) and **D1083** (**HVC131**).

The modulated transmit signal is passed through buffer amplifiers **Q1121** and **Q1122** (both **2SC5374**) and diode switches **D1089** and **D1102** (both **HSC277**) to the pre-drive amplifier **Q1132** (**2SK2596**).

The amplified transmit signal from **Q1132** is passed through the diode switch **D1105, D1106** (both **HSC277**) and the driver amplifier **Q1134** (**RD07MVS1**) to diode switch **D1108** (**RLS135**), then finally amplified by power amplifier **Q1135** (**RD70HVF1**) up to 50 Watts of power output. These three stages of the power amplifier's gain are controlled by the APC circuit.

The 50-Watt RF signal is passed through a low-pass filter network to the antenna switch **D1113** and **D1114** (**UM9957F**), then passed through a high-pass filter network and another low-pass filter network to the ANT jack.

APC (Automatic Power Control) Circuit

430 MHz

A portion of the power amplifier output is rectified by **D1121** and **D1122** (both **MA2S728**) then delivered to APC **Q1129** (**NJM2904V**), as a DC voltage which is proportional to the output level of the power amplifier.

At **Q1129**, the rectified DC voltage from the power amplifier is compared to the reference voltage from the main CPU **Q1104** to produce a control voltage, which regulates the supply voltage to the pre-drive amplifier **Q1132** (**2SK2596**), driver amplifier **Q1134** (**RD07MVS1**), and power amplifier **Q1135** (**RD70HVF1**), so as to maintain stable output power under varying antenna loading conditions.

144 MHz

A portion of the power amplifier output is rectified by **D1109** and **D1110** (both **MA2S728**) then delivered to APC **Q1129** (**NJM2904V**), as a DC voltage which is proportional to the output level of the power amplifier.

At **Q1129**, the rectified DC voltage from the power amplifier is compared to the reference voltage from the main CPU **Q1104** to produce a control voltage, which regulates the supply voltage to the pre-drive amplifier **Q1132** (**2SK2596**), driver amplifier **Q1134** (**RD07MVS1**), and power amplifier **Q1135** (**RD70HVF1**), so as to maintain stable output power under varying antenna loading conditions.

PTT (Push to Talk) Circuit

430 MHz

When the PTT switch is pressed, pin 8 of sub CPU **Q2001** (**M38223M4M**) goes "high," which sends the "PTT" command to main CPU **Q1104**.

When the "PTT" command is received, the main CPU controls the I/O IC **Q1095** (**BU2090FS**), causing pin 8 of **Q1095** to go "low" which activates the UHF TX switch section of **Q1096** (**IMT17**).

When the UHF TX switch section of **Q1096** is activated, it controls the antenna switch diodes **D1118**, **D1119**, and **D1120** (all **UM9957F**), modulator switching diode **D1088** (**DAN222**), modulator switching transistor **Q1114** and **Q1115** (both **DTC144EE**), diode switches **D1099, D1101, D1106** and **D1107** (all **HSC277**), and APC switches **Q1130** (**DTA144EE**) and **Q1131** (**DTC144EE**), which activate the 430 MHz transmitter circuit.

144 MHz

When the PTT switch is pressed, pin 8 of sub CPU **Q2001** (**M38223M4M**) goes "high," which sends the "PTT" command to main CPU **Q1104**.

When the "PTT" command is received, the main CPU controls the I/O IC **Q1095** (**BU2090FS**), causing pin 9 of **Q1095** to go "low" which activates the VHF TX switch section of **Q1096** (**IMT17**).

When the VHF TX switch section of **Q1096** is activated, it controls the antenna switch diodes **D1113** and **D1114** (both **UM9957F**), **D1117** (**HSC277**) and **D1115, D1116** (**RLS135**), modulator switching transistor **Q1114** and **Q1115** (both **DTC144EE**), diode switches **D1089, D1102, D1105, D1106** (all **HSC277**) and **D1108** (**RLS135**), and APC switches **Q1130** (**DTA144EE**) and **Q1131** (**DTC144EE**), which activate the 144 MHz transmitter circuit.

PLL Circuit

"Main" band

A portion of the output from UHF-VCO/B **Q1116** (**2SC5006**) is passed through buffer amplifier **Q1117** (**2SC5006**) and diode switch **D1086** (**HSC277**) to the programmable divider section of the PLL IC **Q1109** (**MB15A02PFV1**), where it is divided according to the frequency dividing data associated with the operating frequency input from the main CPU **Q1104**. It is then sent to the phase comparator.

A portion of the output from the VHF-VCO/B **Q1120** (**2SC5374**) is passed through buffer amplifier **Q1121** (**2SC5374**) and diode switch **D1087** (**HSC277**) to the programmable divider section of the PLL IC **Q1109**, where it is divided according to the frequency dividing data associated with the operating frequency input from the main CPU **Q1104**. It is then sent to the phase comparator.

The 11.15 MHz reference oscillator **X1002** frequency is divided by the reference frequency divider section of **Q1109** into 2230 or 1784 parts, to become 5 kHz or 6.25 kHz comparative reference frequencies, which are utilized by the phase comparator.

The phase comparator section of **Q1109** compares the phase between the frequency-divided oscillation frequency of the VCO circuit and the comparative frequency, and its output is a pulse corresponding to the phase difference. This pulse is integrated by the loop filter into a control voltage (VCV) to control the oscillation frequency of the VCOs.

Circuit Description

"Sub" band

A portion of the output from the UHF-VCO/A **Q1123** (**2SC5006**) is passed through buffer amplifier **Q1124** (**2SC5006**) and diode switch **D1093** (**HVC131**) to the programmable divider section of the PLL IC **Q1122** (**MB15A02PFV1**), where it is divided according to the frequency dividing data associated with the operating frequency input from the main CPU **Q1104**. It is then sent to the phase comparator.

A portion of the output from the VHF-VCO/A **Q1126** (**2SC5374**) is passed through buffer amplifier **Q1127** (**2SC5374**) and diode switch **D1097** (**HVC131**) to the programmable divider section of the PLL IC **Q1122**, where it is divided according to the frequency dividing data associated with the operating frequency input from the main CPU **Q1104**. It is then sent to the phase comparator.

The 11.7 MHz reference oscillator **X1003** frequency is divided by the reference frequency divider section of **Q1122** into 2340 or 1872 parts to become 5 kHz or 6.25 kHz comparative reference frequencies, which are utilized by the phase comparator.

The phase comparator section of **Q1122** compares the phase between the frequency-divided oscillation frequency of the VCO circuit and the comparative frequency, and its output is a pulse corresponding to the phase difference. This pulse is integrated by the loop filter into a control voltage (VCV) to control the oscillation frequency of the VCOs.

Power Supply Line

When the user presses and holds in the "Right" VOL knob for 2 seconds, pin 23 of the main CPU **Q1104** goes "low" and pin 40 of main CPU **Q1104** goes "high," which activates the power switch **Q1078** (2SB1301) and **Q1082** (**2SC4617**), to supply 13.8 VDC to each circuit in the transceiver.

Introduction and Precautions

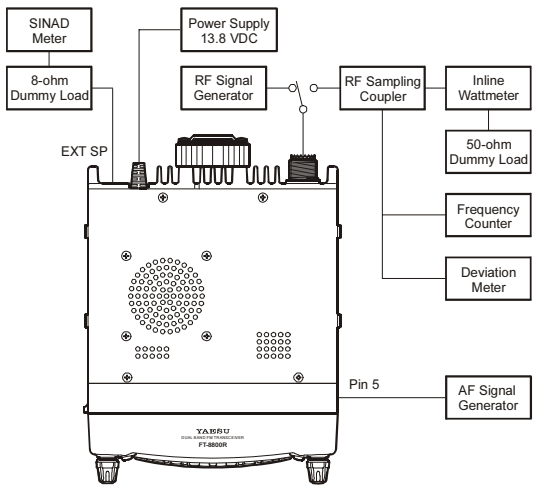
The **FT-8800R** has been carefully aligned at the factory for the specified performance across the 144 MHz and 430 MHz amateur bands. Realignment should therefore not be necessary except in the event of a component failure. All component replacement and service should be performed only by an authorized Vertex Standard representative, or the warranty policy may be voided.

The following procedures cover the sometimes critical and tedious adjustments that are not normally required once the transceiver has left the factory. However, if damage occurs and some parts are replaced, realignment may be required. If a sudden problem occurs during normal operation, it is likely due to component failure; realignment should not be done until after the faulty component has been replaced.

We recommend that servicing be performed only by authorized Vertex Standard service technicians who are experienced with the circuitry and fully equipped for repair and alignment. Therefore, if a fault is suspected, contact the dealer from whom the transceiver was purchased for instructions regarding repair. Authorized Vertex Standard service technicians realign all circuits and make complete performance checks to ensure compliance with factory specifications after replacing any faulty components.

Those who do undertake any of the following alignments are cautioned to proceed at their own risk. Problems caused by unauthorized attempts at realignment are not covered by the warranty policy. Also, Vertex Standard must reserve the right to change circuits and alignment procedures in the interest of improved performance, without notifying owners.

Under no circumstances should any alignment be attempted unless the normal function and operation of the transceiver are clearly understood, the cause of the malfunction has been clearly pinpointed and any faulty components replaced, and the need for realignment determined to be absolutely necessary.



Required Test Equipment

The following test equipment (and thorough familiarity with its correct use) is necessary for complete realignment. Correction of problems caused by misalignment resulting from use of improper test equipment is not covered under the warranty policy. While most steps do not require all of the equipment listed, the interactions of some adjustments may require that more complex adjustments be performed afterwards. Do not attempt to perform only a single step unless it is clearly isolated electrically from all other steps. Have all test equipment ready before beginning, and follow all of the steps in a section in the order presented.

- ❒ Regulated DC Power Supply: adjustable from 11.5 to 16 VDC, 10 A
- ❒ RF Signal Generator with calibrated output level at 500 MHz
- ❒ Frequency Counter: ±0.1 ppm accuracy at 500 MHz
- ❒ AF Signal Generator
- ❒ SINAD Meter
- ❒ Oscilloscope
- ❒ Spectrum Analyzer
- ❒ Deviation Meter (linear detector)
- ❒ AF Milivoltmeter
- ❒ AF Dummy Load: 8-Ohm, 5 W
- ❒ DC Voltmeter: high impedance
- ❒ Inline Wattmeter with 5% accuracy at 500 MHz
- ❒ 50-Ohm non-reactive Dummy Load: 100 watts at 500 MHz
- ❒ VHF/UHF Sampling Coupler

Set up the test equipment as shown for the transceiver alignment, and apply 13.8 VDC power to the transceiver.

Alignment Preparation & Precautions

A dummy load and inline wattmeter must be connected to the main antenna jack in all procedures that call for transmission, except where specified otherwise. Correct alignment is not possible with an antenna. After completing one step, read the following step to determine whether the same test equipment will be required. If not, remove the test equipment (except dummy load and wattmeter, if connected) before proceeding.

Correct alignment requires that the ambient temperature in the repair shop be the same as that of the transceiver and test equipment, and that this temperature be held constant between 68 °C and 86 °F (20 °C ~ 30 °C). When the transceiver is brought into the shop from hot or cold air it should be allowed some time for thermal equalization with the environment before alignment. If possible, alignments should be made with oscillator shields and circuit boards firmly affixed in place. Also, the test equipment must be thoroughly warmed up before beginning.

Notes: Signal levels in dB referred to in alignment are based on 0 dBμ = 0.5 μV (closed circuit).

Alignment

Entering the Alignment mode

Alignment of the **FT-8800R** is performed using a front-panel software-based procedure. To perform alignment of the transceiver, it must first be placed in the "Alignment Mode," in which the adjustments will be made and then stored into memory.

To enter the Alignment mode:

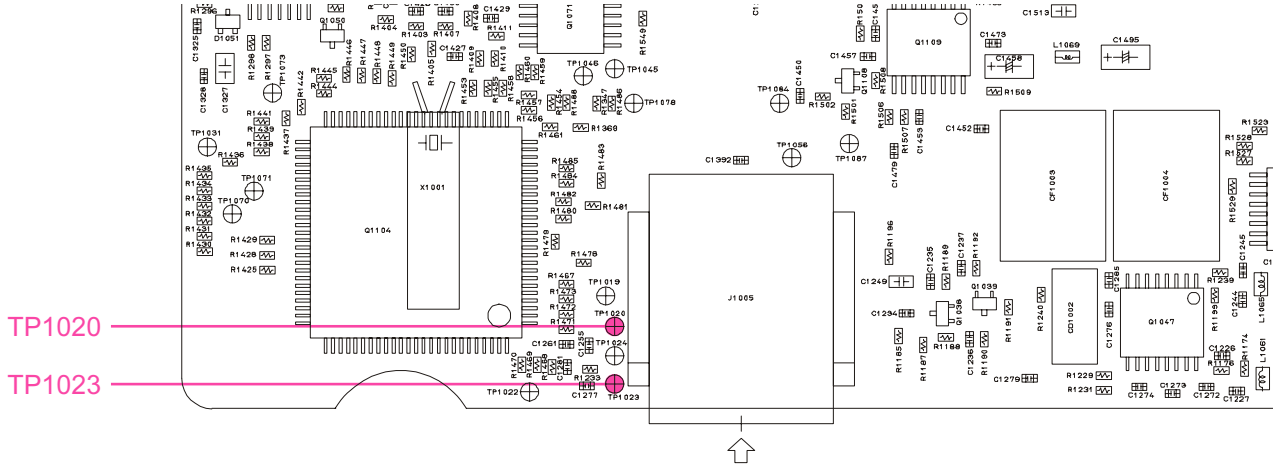
1. Press and hold in the "Left" band [**V/M**] key and the Hyper Memory [**6**] key while turning the radio on. Once the radio is on, release these two keys.
2. Press the front panel keys in the following sequence.
   "Left" band [**LOW**] → "Left" band [**V/M**] →
   "Left" band [**HM**] → "Left" band [**SCN**] →
   "Right" band [**LOW**] → "Right" band [**V/M**] →
   "Right" band [**HM**] → "Right" band [**SCN**].
3. You will now note the appearance of "b-0 REF.xxH" on the display, this signifies that the transceiver is now in the "Alignment" mode.

PLL Reference Frequency

1. Press the "Sub" band **DIAL** knob momentarily, if needed, to switch the "Main" band to be the "Right" band.
2. Tune the "Right" band frequency to 435.050 MHz.
3. Press and hold in the in the "Left" **DIAL** knob, if needed, to set the Alignment parameter to "b-0 REF.xxH."
4. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the counter frequency reading is 435.050 MHz (±100 Hz).
5. Press the "Right" band [**SCN**] key.
6. Press and hold in the in the "Right" **DIAL** knob, if needed, to set the Alignment parameter to "A-0 REF.xxH."
7. Tune the "Left" band frequency to 435.050 MHz.
8. Connect the frequency counter fed through the 0.001 µF capactor to the **TP1104**.
9. Adjust the "Right" **DIAL** knob, as needed, so that the counter frequency reading is 387.800 MHz (±100 Hz).

RF Front-end Tuning

1. Connect the DC voltmeter to **TP1020** on the MAIN Unit, then inject a 439.050 MHz signal at a level of +10 dBµ (with 1 kHz modulation @ ±3.5 kHz deviation) from the RF Signal Generator.
2. Press the "Sub" band **DIAL** knob momentarily, if needed, to switch the "Main" band to be the "Right" band.
3. Tune the "Right" band frequency to 439.050 MHz.
4. Press and hold in the in the "Left" **DIAL** knob to set the Alignment parameter to "b-1 TUN.xxH."
5. Adjust the "Left" **DIAL** knob, as needed, so that the DC voltmeter reading is 1.1 V.
6. Tune the "Right" band frequency to 145.050 MHz.
7. Inject a 145.050 MHz signal at a level of +10 dBµ (with 1 kHz modulation @ ±3.5 kHz deviation) from the RF Signal Generator.
8. Adjust the "Left" **DIAL** knob, as needed, so that the DC voltmeter reading is 1.2 V.
9. Press the "Right" band [**SCN**] key.
10. Press and hold in the in the "Right" **DIAL** knob, if needed, to set the Alignment parameter to "A-1 TUN.xxH."
11. Connect the DC voltmeter to **TP1023** on the MAIN Unit.
12. Tune the "Left" band frequency to 439.050 MHz.
13. Inject a 439.050 MHz signal at a level of +10 dBµ (with 1 kHz modulation @ ±3.5 kHz deviation) from the RF Signal Generator.
14. Adjust the "Right" **DIAL** knob, as needed, so that the DC voltmeter reading is 1.1 V.
15. Tune the "Left" band frequency to 145.050 MHz.
16. Inject a 145.050 MHz signal at a level of +10 dBµ (with 1 kHz modulation @ ±3.5 kHz deviation) from the RF Signal Generator.
17. Adjust the "Right" **DIAL** knob, as needed, so that the DC voltmeter reading is 1.2 V.



MAIN UNIT TEST POINTS

TX Power Output

1. Press the "Sub" band **DIAL** knob momentarily, if needed, to switch the "Main" band to be the "Right" band.
2. Tune the "Right" band frequency to 440.050 MHz, then set the Transmit Power Level to "LOW."
3. Press and hold in the in the "Left" **DIAL** knob to set the Alignment parameter to "b-2 PWR.xxH."
4. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the wattmeter reading is 5 Watts (±0.5 Watt).
5. Increase the Transmit Power Level to "MID2."
6. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the wattmeter reading is 10 Watts (±0.5 Watt).
7. Increase the Transmit Power Level to "MID1."
8. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the wattmeter reading is 20 Watts (±0.5 Watt).
9. Increase the Transmit Power Level to "HIGH."
10. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the wattmeter reading is 35 Watts (±0.5 Watt).
11. Tune the "Right" band frequency to 146.050 MHz, then set the Transmit Power Level to "LOW."
12. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the wattmeter reading is 5 Watts (±0.5 Watt).
13. Increase the Transmit Power Level to "MID2."
14. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the wattmeter reading is 10 Watts (±0.5 Watt).
15. Increase the Transmit Power Level to "MID1."
16. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the wattmeter reading is 20 Watts (±0.5 Watt).
17. Increase the Transmit Power Level to "HIGH."
18. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the wattmeter reading is 50 Watts (±0.5 Watt).

TX Deviation

1. Press the "Sub" band **DIAL** knob momentarily, if needed, to switch the "Main" band to be the "Right" band.
2. Tune the "Right" band frequency to 440.050 MHz, then set the Transmit Power Level to "LOW."
3. Press and hold in the in the "Left" **DIAL** knob to set the Alignment parameter to "b-3 DEV.xxH."
4. Inject a 1 kHz audio tone at a level of 80 mV from the Audio Generator.
5. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the deviation meter reading is 4.5 kHz (±0.2 kHz) (USA Version: 4.2 kHz (±0.2 kHz)).
6. Tune the "Right" band frequency to 146.050 MHz, then set the Transmit Power Level to "LOW."
7. Press the **PTT** switch to activate the transmitter, and adjust the "Left" **DIAL** knob, as needed, so that the deviation meter reading is 4.5 kHz (±0.2 kHz) (USA Version: 4.2 kHz (±0.2 kHz)).

DCS Tx Deviation

1. Press the "Sub" band **DIAL** knob momentarily, if needed, to switch the "Main" band to be the "Right" band.
2. Press and hold in the in the "Left" **DIAL** knob to set the Alignment parameter to "b-4 DCS.xxH."
3. Tune the "Right" band frequency to 440.050 MHz, then activate DCS with the 023 DCS code, and set the Transmit Power Level to "LOW."
4. Press the **PTT** switch to activate the transmitter (with no microphone input), and adjust the "Left" **DIAL** knob, as needed, so that the deviation meter reading is between 0.60 kHz and 0.80 kHz.
5. Tune the "Right" band frequency to 146.050 MHz, then activate DCS with the 023 DCS code, and set the Transmit Power Level to "LOW."
6. Press the **PTT** switch to activate the transmitter (with no microphone input), adjust the "Left" **DIAL** knob, as needed, so that the deviation meter reading is between 0.60 kHz and 0.80 kHz.

Alignment

CTCSS Tx Deviation

1. Press the "Sub" band **DIAL** knob momentarily, if needed, to switch the "Main" band to be the "Right" band.
2. Press and hold in the in the "Left" **DIAL** knob to set the Alignment parameter to "b-5 CTC.xxH."
3. Tune the "Right" band frequency to 440.050 MHz, then activate the CTCSS Encoder with a 100 Hz tone, and set the Transmit Power Level to "LOW."
4. Press the **PTT** switch to activate the transmitter (with no microphone input), and adjust the "Left" **DIAL** knob, as needed, so that the deviation meter reading is between 0.65 kHz and 0.75 kHz.
5. Tune the "Right" band frequency to 146.050 MHz, then activate the CTCSS Encoder with a 100 Hz tone, and set the Transmit Power Level to "LOW."
6. Press the **PTT** switch to activate the transmitter (with no microphone input), and adjust the "Left" **DIAL** knob, as needed, so that the deviation meter reading is between 0.65 kHz and 0.75 kHz.

Center Meter Sensitivity

1. Inject a 440.050 MHz signal at a level of 10 dBµ from the RF Signal Generator.
2. Press the "Sub" band **DIAL** knob momentarily, if needed, to switch the "Main" band to be the "Right" band.
3. Tune the "Right" band frequency to 440.050 MHz.
4. Press and hold in the in the "Left" **DIAL** knob to set the Alignment parameter to "b-6 CTRL/V."
5. Press the "Left" band [**LOW**] key.
6. Press the "Right" band [**SCN**] key.
7. Tune the "Left" band frequency to 440.050 MHz.
8. Press and hold in the "Right" **DIAL** knob to set the Alignment parameter to "A-6 CTRL/V."
9. Inject a 440.050 MHz signal at a level of 10 dBµ from the RF Signal Generator.
10. Press the "Left" band [**LOW**] key.

S-Meter Sensitivity

1. Inject a 440.050 MHz signal at a level of –5 dBµ from the RF Signal Generator.
2. Press the "Sub" band **DIAL** knob momentarily, if needed, to switch the "Main" band to be the "Right" band.
3. Tune the "Right" band frequency to 440.050 MHz.
4. Press and hold in the in the "Left" **DIAL** knob to set the Alignment parameter to "b-7 SM L/V."
5. Press the "Left" band [**LOW**] key.
6. Increase the RF Signal Generator output level to +23 dBµ.
7. Press the "Left" band [**V/M**] key.
8. Tune the "Right" band frequency to 146.050 MHz.
9. Inject a 146.050 MHz signal at a level of –5 dBµ from the RF Signal Generator.
10. Press the "Left" band [**LOW**] key.
11. Increase the RF Signal Generator output level to +23 dBµ.
12. Press the "Left" band [**V/M**] key.
13. Tune the "Right" band frequency to 230.050 MHz.
14. Inject a 230.050 MHz signal at a level of –5 dBµ from the RF Signal Generator.
15. Press the "Left" band [**LOW**] key.
16. Increase the RF Signal Generator output level to +23 dBµ.
17. Press the "Left" band [**V/M**] key.
18. Tune the "Right" band frequency to 350.05 MHz.
19. Inject an 350.05 MHz signal at a level of –5 dBµ from the RF Signal Generator.
20. Press the "Left" band [**LOW**] key.
21. Increase the RF Signal Generator output level to +23 dBµ.
22. Press the "Left" band [**V/M**] key.
23. Tune the "Right" band frequency to 850.05 MHz.
24. Inject an 850.05 MHz signal at a level of +3 dBµ from the RF Signal Generator.
25. Press the "Left" band [**LOW**] key.
26. Increase the RF Signal Generator output level to +31 dBµ.
27. Press the "Left" band [**V/M**] key.
28. Press the "Right" band [**SCN**] key.
29. Tune the "Left" band frequency to 440.050 MHz.
30. Inject a 440.050 MHz signal at a level of –5 dBµ from the RF Signal Generator.
31. Press and hold in the in the "Right" **DIAL** knob to set the Alignment parameter to "a-7 SM L/V."
32. Press the "Left" band [**LOW**] key.
33. Increase the RF Signal Generator output level to +23 dBµ.
34. Press the "Left" band [**V/M**] key.
35. Tune the "Left" band frequency to 146.050 MHz.
36. Inject a 146.050 MHz signal at a level of –5 dBµ from the RF Signal Generator.
37. Press the "Left" band [**LOW**] key.
38. Increase the RF Signal Generator output level to +23 dBµ.
39. Press the "Left" band [**V/M**] key.
40. Tune the "Left" band frequency to 230.050 MHz.
41. Inject a 230.050 MHz signal at a level of –5 dBµ from the RF Signal Generator.
42. Press the "Left" band [**LOW**] key.
43. Increase the RF Signal Generator output level to +23 dBµ.
44. Press the "Left" band [**V/M**] key.
45. Tune the "Left" band frequency to 350.05 MHz.
46. Inject an 350.05 MHz signal at a level of –5 dBµ from the RF Signal Generator.
47. Press the "Left" band [**LOW**] key.
48. Increase the RF Signal Generator output level to +23 dBµ.

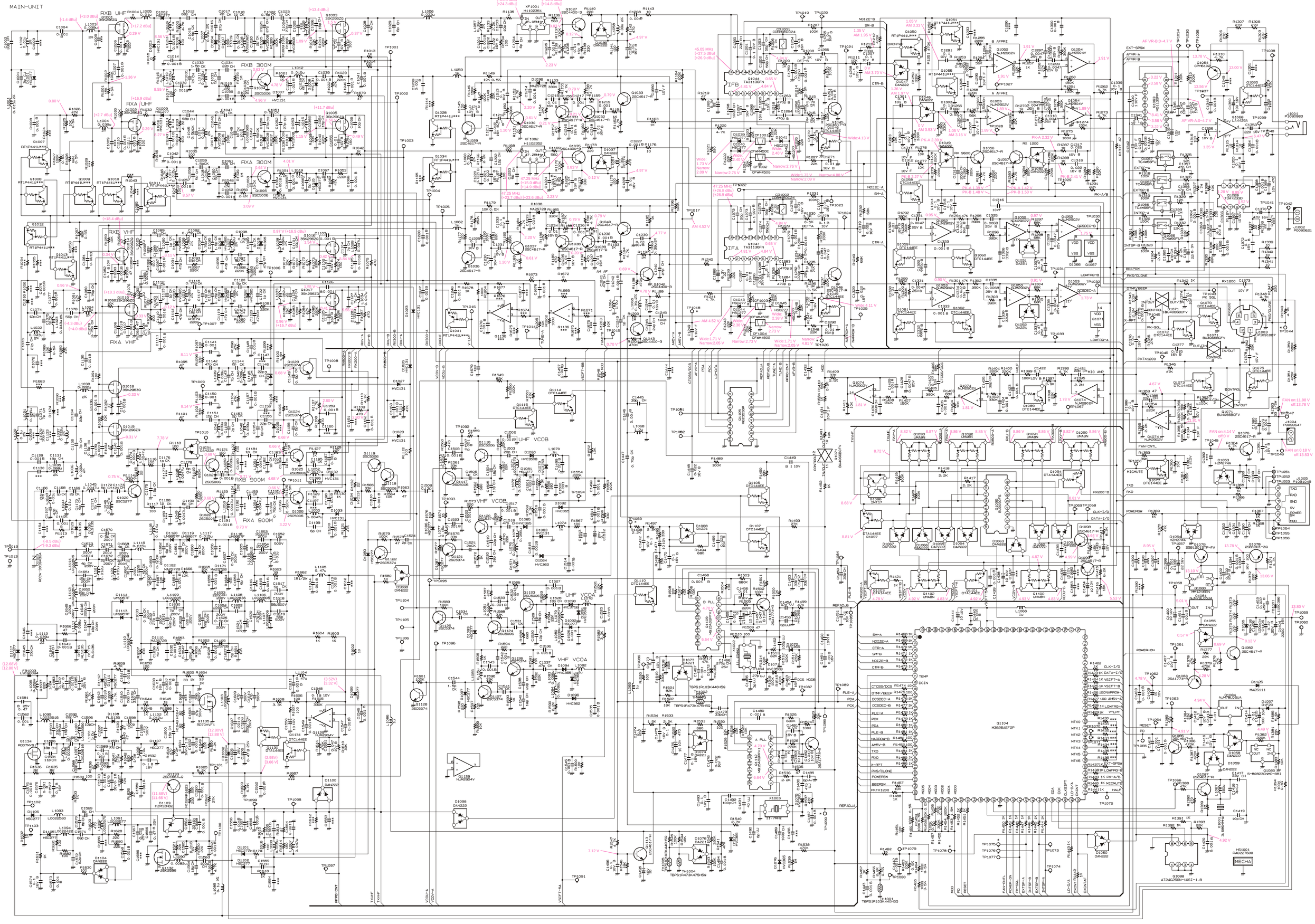
49. Press the “Left” band [**V/M**] key.
50. Tune the “Left” band frequency to 850.05 MHz.
51. Inject an 850.05 MHz signal at a level of +3 dBµ from the RF Signal Generator.
52. Press the “Left” band [**LOW**] key.
53. Increase the RF Signal Generator output level to +31 dBµ.
54. Press the “Left” band [**V/M**] key.

DC Voltmeter

1. Set the power supply voltage to 13.8 VDC.
2. Press and hold in the in the “Sub” band **DIAL** knob to set the Alignment parameter to “b-8 BAT SC.”
3. Press the “Left” band [**SCN**] key.

To close the Alignment mode, just press and hold in the “Right” **VOL** knob for 2 seconds (to turn the power off). The next time the transceiver is turned on, normal operation may resume.

Note:

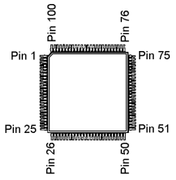


( ) : 145.050 MHz
[ ] : 433.05 MHz

MAIN Unit

Note:

Parts Layout



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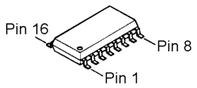
(Q1104)



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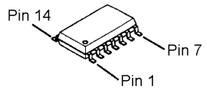
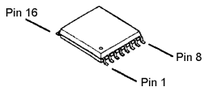


BU4066BCFV
(Q1071)

NJM2902V
(Q1052, 1074)

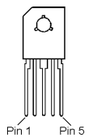


BU2090FS
(Q1095)

MB15A02PFV1
(Q1109, 1112)

TA31136FN
(Q1044, 1047)

TDA7233D
(Q1069)



LA4425A
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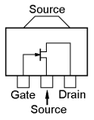

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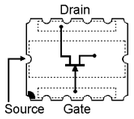

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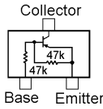
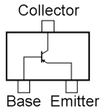
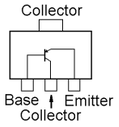


DTA144EE (16)
(Q1094, 1097, 1101, 1103)



2SA1774 (FR)
(Q1108, 1111)



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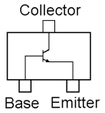


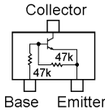
2SC4400 (RT4)
(Q1027, 1035, 1043)

2SC4617 (BR)
(Q1030, 1038, 1039, 1056, 1057, 1082, 1098, 1099)

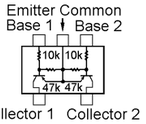
2SC5006 (24)
(Q1004, 1021, 1022, 1025, 1026, 1118, 1119)

2SC5277 (D2)
(Q1020)

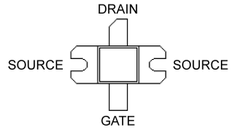
2SC5374 (NA)
(Q1024, 1122, 1125, 1128)



DTC144EE (26)
(Q1058, 1059, 1060, 1070, 1072, 1110)



UMA8N (A8)
(Q1090, 1091, 1092, 1093, 1100, 1102)



RD70HVF1
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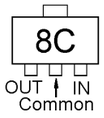
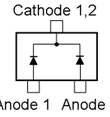
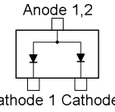


NJM78L05 (8C)
(Q1081)

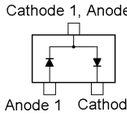


DAN222 (N)
(D1035, 1037, 1049, 1050, 1055, 1063, 1066, 1098, 1104)

Side A



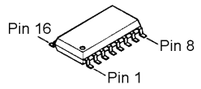
DAP222 (P)
(D1061, 1062, 1064, 1065, 1067)



DA221 (K)
(D1051, 1068, 1074)

MAIN Unit

Side B



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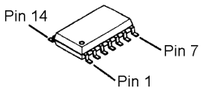

NJM2902V
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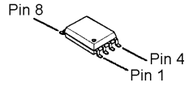
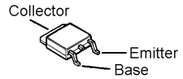


NJM2904V
(Q1054, 1129)

TC4W66FU
(Q1066, 1067)



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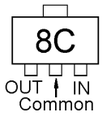
AT24C256N
(Q1088)



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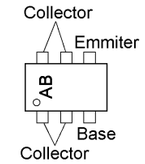
(Q1084)



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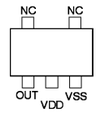

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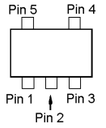

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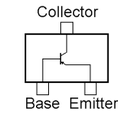

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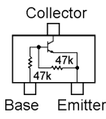
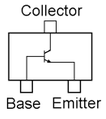
(Q1083)



DTC144EE (26)
(Q1046, 1049, 1061, 1062, 1065, 1073, 1075, 1077, 1089, 1106, 1107, 1114, 1115, 1131)

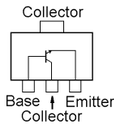


2SC4400 (RT4)
(Q1042)

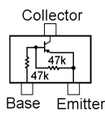
2SC4617 (BR)
(Q1029, 1031, 1032, 1033, 1036, 1037, 1040, 1045, 1048, 1076, 1086, 1087, 1113)

2SC5006 (24)
(Q1006, 1116, 1117, 1123, 1124)

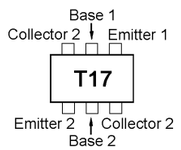
2SC5374 (NA)
(Q1023, 1120, 1121, 1126, 1127)



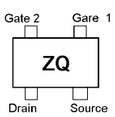
2SD1664 (DA)
(Q1133)



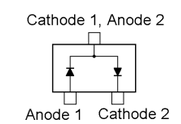
DTA144EE (16)
(Q1130)



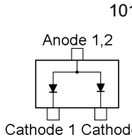
IMT17 (T17)
(Q1096)



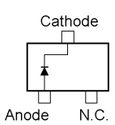
3SK296ZQ (ZQ)
(Q1001, 1002, 1003, 1005, 1014, 1015, 1016, 1017, 1018, 1019)



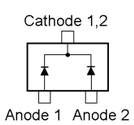
DA221 (K)
(D1052, 1073, 1078)



HZ27WA (27A)
(Q1053, 1054)



HZM13NB2 (132)
(Q1103)



DAN222 (N)
(D1031, 1047, 1048, 1058, 1059, 1060, 1088, 1100)

Parts List

REF	DESCRIPTION	VALUE	V/W	TOL.	MFR'S DESIG	VXSTD P/N	VERS.	LOT	SIDE	LAY ADR
	PCB with Component					CS1795003	TYP: A2U			
						CS1795004	TYP: A1			
						CS1795005	TYP: A2			
						CS1795006	TYP: A3			
						CS1795007	TYP: B1			
						CS1795008	TYP: B2			
						CS1795009	TYP: B3			
						CS1795010	TYP: C1			
						CS1795011	TYP: C2			
						CS1795012	TYP: C3			
						CS1795013	TYP: D1			
						CS1795014	TYP: D2			
						CS1795015	TYP: H1			
						CS1795016	TYP: H2			
	Printed Circuit Board				AH008M000	FR010190C		1-		
C 1001	CHIP CAP.	3pF	50V	CJ	GRM36CJ030B50PT	K22178290		1-	B	b3
C 1002	CHIP CAP.	33pF	50V	CH	GRM36CH330J50PT	K22178224		1-	B	b3
C 1004	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1006	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c3
C 1007	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1008	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1010	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1011	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1012	CHIP CAP.	68pF	50V	CH	GRM36CH680J50PT	K22178232		1-	B	c3
C 1013	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c3
C 1014	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c3
C 1015	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	c3
C 1016	CHIP CAP.	27pF	50V	CH	GRM36CH270J50PT	K22178222		1-	B	c3
C 1017	CHIP CAP.	2pF	50V	CK	GRM36CK020B50PT	K22178289		1-	B	c3
C 1018	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	c3
C 1019	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	c3
C 1020	CHIP CAP.	2pF	50V	CK	GRM36CK020B50PT	K22178289		1-	B	c3
C 1021	CHIP CAP.	27pF	50V	CH	GRM36CH270J50PT	K22178222		1-	B	c3
C 1022	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	c3
C 1023	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	c3
C 1024	CHIP CAP.	27pF	50V	CH	GRM36CH270J50PT	K22178222		1-	B	c3
C 1026	CHIP CAP.	15pF	50V	CH	GRM36CH150J50PT	K22178216		1-	B	c3
C 1027	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	c3
C 1028	CHIP CAP.	4pF	50V	CH	GRM36CH040B50PT	K22178291		1-	A	D3
C 1029	CHIP CAP.	6pF	50V	CH	GRM36CH060B50PT	K22178293		1-	A	D3
C 1030	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	E3
C 1031	CHIP CAP.	7pF	50V	CH	GRM36CH070B50PT	K22178294		1-	A	D3
C 1032	CHIP CAP.	1.5pF	50V	CK	GRM36CK1R5B50PT	K22178288		1-	A	D3
C 1033	CHIP CAP.	5pF	50V	CH	GRM36CH050B50PT	K22178292		1-	A	D3
C 1034	CHIP CAP.	22pF	50V	CH	GRM36CH220J50PT	K22178220		1-	A	D3
C 1035	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	D3
C 1036	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	A	D3
C 1037	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c3
C 1038	CHIP CAP.	2pF	50V	CK	GRM36CK020B50PT	K22178289		1-	B	c3
C 1039	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c3
C 1040	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c3
C 1041	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c3
C 1042	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b4
C 1043	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b4
C 1044	CHIP CAP.	68pF	50V	CH	GRM36CH680J50PT	K22178232		1-	B	b4
C 1045	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	b4
C 1046	CHIP CAP.	27pF	50V	CH	GRM36CH270J50PT	K22178222		1-	B	b4
C 1047	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	b4
C 1048	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	b4
C 1049	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	b4
C 1050	CHIP CAP.	27pF	50V	CH	GRM36CH270J50PT	K22178222		1-	B	b4
C 1051	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	b4
C 1052	CHIP CAP.	27pF	50V	CH	GRM36CH270J50PT	K22178222		1-	B	b4
C 1054	CHIP CAP.	15pF	50V	CH	GRM36CH150J50PT	K22178216		1-	B	b5
C 1055	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	b5
C 1056	CHIP CAP.	10pF	50V	CH	GRM36CH100B50PT	K22178297		1-	A	E5
C 1057	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b4
C 1058	CHIP CAP.	6pF	50V	CH	GRM36CH060B50PT	K22178293		1-	B	b4
C 1059	CHIP CAP.	1.5pF	50V	CK	GRM36CK1R5B50PT	K22178288		1-	B	b4
C 1060	CHIP CAP.	6pF	50V	CH	GRM36CH060B50PT	K22178293		1-	B	b4
C 1061	CHIP CAP.	22pF	50V	CH	GRM36CH220J50PT	K22178220		1-	B	b4
C 1062	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b5
C 1063	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	b5
C 1064	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b5
C 1065	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b5
C 1066	CHIP CAP.	2pF	50V	CK	GRM36CK020B50PT	K22178289		1-	B	b5
C 1067	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b5

REF	DESCRIPTION	VALUE	V/W	TOL.	MFR'S DESIG	VXSTD P/N	VERS.	LOT	SIDE	LAY ADR
C 1068	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b4
C 1070	CHIP CAP.	30pF	50V	CH	GRM36CH300J50PT	K22178223		1-	B	b2
C 1071	CHIP CAP.	7pF	50V	CH	GRM36CH070B50PT	K22178294		1-	B	b2
C 1073	CHIP CAP.	27pF	50V	CH	GRM36CH270J50PT	K22178222		1-	B	b2
C 1074	CHIP CAP.	12pF	50V	CH	GRM36CH120J50PT	K22178214		1-	B	b2
C 1075	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	b3
C 1076	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1077	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1078	CHIP CAP.	56pF	50V	CH	GRM36CH560J50PT	K22178230		1-	B	b3
C 1079	CHIP CAP.	0.75pF	50V	CK	GRM36CKR75B50PT	K22178286		1-	B	b3
C 1080	CHIP CAP.	0.75pF	50V	CK	GRM36CKR75B50PT	K22178286		1-	B	b3
C 1081	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1082	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	b3
C 1083	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1086	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c4
C 1087	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b4
C 1088	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	b3
C 1089	CHIP CAP.	8pF	50V	CH	GRM36CH080B50PT	K22178295		1-	B	b3
C 1090	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	b4
C 1091	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	b4
C 1092	CHIP CAP.	0.75pF	50V	CK	GRM36CKR75B50PT	K22178286		1-	B	c3
C 1093	CHIP CAP.	18pF	50V	CH	GRM36CH180J50PT	K22178218		1-	B	c4
C 1094	CHIP CAP.	0.75pF	50V	CK	GRM36CKR75B50PT	K22178286		1-	B	c3
C 1095	CHIP CAP.	1.5pF	50V	CK	GRM36CK1R5B50PT	K22178288		1-	B	c3
C 1096	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	c4
C 1097	CHIP CAP.	8pF	50V	CH	GRM36CH080B50PT	K22178295		1-	B	c4
C 1098	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	c3
C 1099	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	c4
C 1100	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	c4
C 1101	CHIP CAP.	10pF	50V	CH	GRM36CH100D50PT	K22178212		1-	B	c4
C 1102	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	c3
C 1103	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c4
C 1104	CHIP CAP.	7pF	50V	CH	GRM36CH070B50PT	K22178294		1-	B	c3
C 1105	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c3
C 1106	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1107	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1108	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	b3
C 1109	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	b4
C 1110	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b4
C 1111	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	a4
C 1112	CHIP CAP.	8pF	50V	CH	GRM36CH080B50PT	K22178295		1-	B	b4
C 1113	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	b4
C 1114	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	a4
C 1115	CHIP CAP.	0.75pF	50V	CK	GRM36CKR75B50PT	K22178286		1-	B	b4
C 1116	CHIP CAP.	18pF	50V	CH	GRM36CH180J50PT	K22178218		1-	B	a4
C 1117	CHIP CAP.	1.5pF	50V	CK	GRM36CK1R5B50PT	K22178288		1-	B	b4
C 1118	CHIP CAP.	0.75pF	50V	CK	GRM36CKR75B50PT	K22178286		1-	B	b4
C 1119	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	a4
C 1120	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	b4
C 1121	CHIP CAP.	8pF	50V	CH	GRM36CH080B50PT	K22178295		1-	B	a4
C 1122	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	b4
C 1123	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	a4
C 1124	CHIP CAP.	10pF	50V	CH	GRM36CH100D50PT	K22178212		1-	B	a5
C 1125	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	b5
C 1126	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	a5
C 1127	CHIP CAP.	7pF	50V	CH	GRM36CH070B50PT	K22178294		1-	B	b5
C 1128	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b5
C 1129	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b2
C 1131	CHIP CAP.	18pF	50V	CH	GRM36CH180J50PT	K22178218		1-	B	b2
C 1132	CHIP CAP.	7pF	50V	CH	GRM36CH070B50PT	K22178294		1-	B	b2
C 1134	CHIP CAP.	22pF	50V	CH	GRM36CH220J50PT	K22178220		1-	B	b3
C 1135	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b2
C 1136	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1137	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1138	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	b3
C 1139	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	a3
C 1140	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b3
C 1141	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b4
C 1142	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	b4
C 1143	CHIP CAP.	7pF	50V	CH	GRM36CH070B50PT	K22178294		1-	B	c4
C 1144	CHIP CAP.	2pF	50V	CK	GRM36CK020B50PT	K22178289		1-	B	c4
C 1145	CHIP CAP.	5pF	50V	CH	GRM36CH050B50PT	K22178292		1-	B	c4
C 1146	CHIP CAP.	22pF	50V	CH	GRM36CH220J50PT	K22178220		1-	B	c4
C 1148	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	E4
C 1149	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	B	c4
C 1150	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	F4
C 1151	CHIP CAP.	15pF	50V	CH	GRM36CH150J50PT	K22178216		1-	A	F4

REF	DESCRIPTION	VALUE	V/W	TOL.	MFR'S DESIG	VXSTD P/N	VERS.	LOT	SIDE	LAY ADR
C 1152	CHIP CAP.	7pF	50V	CH	GRM36CH070B50PT	K22178294		1-	A	F4
C 1153	CHIP CAP.	2pF	50V	CK	GRM36CK020B50PT	K22178289		1-	A	F4
C 1154	CHIP CAP.	6pF	50V	CH	GRM36CH060B50PT	K22178293		1-	A	E4
C 1155	CHIP CAP.	22pF	50V	CH	GRM36CH220J50PT	K22178220		1-	A	E4
C 1157	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	F5
C 1158	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	A	F5
C 1159	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	F5
C 1162	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c4
C 1163	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	D4
C 1165	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	b2
C 1166	CHIP CAP.	2pF	50V	CK	GRM36CK020B50PT	K22178289		1-	B	a3
C 1167	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	a3
C 1168	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	a3
C 1169	CHIP CAP.	2pF	50V	CK	GRM36CK020B50PT	K22178289		1-	B	a3
C 1170	CHIP CAP.	6pF	50V	CH	GRM36CH060B50PT	K22178293		1-	B	a3
C 1171	CHIP CAP.	7pF	50V	CH	GRM36CH070B50PT	K22178294		1-	A	F3
C 1172	CHIP CAP.	5pF	50V	CH	GRM36CH050B50PT	K22178292		1-	A	F3
C 1173	CHIP CAP.	12pF	50V	CH	GRM36CH120J50PT	K22178214		1-	A	F4
C 1174	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	F4
C 1175	CHIP CAP.	1.5pF	50V	CK	GRM36CK1R5B50PT	K22178288		1-	A	F3
C 1176	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	A	F3
C 1178	CHIP CAP.	8pF	50V	CH	GRM36CH080B50PT	K22178295		1-	A	F4
C 1179	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	E4
C 1181	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	A	E4
C 1182	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	A	E4
C 1183	CHIP CAP.	10pF	50V	CH	GRM36CH100D50PT	K22178212		1-	A	D4
C 1184	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	A	D4
C 1185	CHIP CAP.	2pF	50V	CK	GRM36CK020B50PT	K22178289		1-	A	D4
C 1186	CHIP CAP.	4pF	50V	CH	GRM36CH040B50PT	K22178291		1-	A	D3
C 1187	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	D4
C 1188	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	A	F4
C 1190	CHIP CAP.	8pF	50V	CH	GRM36CH080B50PT	K22178295		1-	A	F4
C 1191	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	E4
C 1193	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	A	E4
C 1194	CHIP CAP.	0.75pF	50V	CK	GRM36CKR75B50PT	K22178286		1-	A	E4
C 1195	CHIP CAP.	10pF	50V	CH	GRM36CH100B50PT	K22178297		1-	A	E4
C 1196	CHIP CAP.	0.5pF	50V	CK	GRM36CK0R5B50PT	K22178285		1-	A	E4
C 1198	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	E4
C 1199	CHIP CAP.	6pF	50V	CH	GRM36CH060B50PT	K22178293		1-	A	E4
C 1200	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	E4
C 1201	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	e4
C 1202	CHIP CAP.	0.022uF	16V	B	GRM36B223K16PT	K22128806		1-	B	e4
C 1203	CHIP CAP.	10pF	50V	CH	GRM36CH100B50PT	K22178297		1-	B	d4
C 1204	CHIP CAP.	6pF	50V	CH	GRM36CH060B50PT	K22178293		1-	A	C4
C 1205	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	C4
C 1206	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	C4
C 1207	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	B4
C 1208	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	C4
C 1209	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	E4
C 1210	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	f4
C 1211	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	B4
C 1212	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	B4
C 1213	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	B4
C 1214	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	f3
C 1215	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	f4
C 1216	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	f3
C 1217	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	f3
C 1218	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	e3
C 1219	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	e3
C 1220	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	E5
C 1221	CHIP CAP.	0.022uF	16V	B	GRM36B223K16PT	K22128806		1-	A	E5
C 1222	CHIP CAP.	12pF	50V	CH	GRM36CH120J50PT	K22178214		1-	A	E5
C 1223	CHIP CAP.	6pF	50V	CH	GRM36CH060B50PT	K22178293		1-	A	E5
C 1224	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	E5
C 1225	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	E5
C 1226	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	D5
C 1227	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	D5
C 1228	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	a4
C 1229	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	d5
C 1230	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	d5
C 1231	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	d5
C 1232	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	d5
C 1233	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	d5
C 1234	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	C5
C 1235	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	C5
C 1236	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	C5
C 1237	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	C5

REF	DESCRIPTION	VALUE	V/W	TOL.	MFR'S DESIG	VXSTD P/N	VERS.	LOT	SIDE	LAY ADR
C 1238	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	d5
C 1239	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	e4
C 1240	CHIP CAP.	27pF	50V	CH	GRM36CH270J50PT	K22178222		1-	B	e4
C 1241	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	e4
C 1242	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	e4
C 1243	CHIP CAP.	1pF	50V	CK	GRM36CK010B50PT	K22178287		1-	B	d4
C 1244	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	D5
C 1245	CHIP CAP.	100pF	50V	CH	GRM36CH101J50PT	K22178236		1-	A	D5
C 1246	CHIP CAP.	24pF	50V	CH	GRM36CH240J50PT	K22178221		1-	A	D5
C 1247	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	c4
C 1248	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	a5
C 1249	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	A	C5
C 1250	CHIP CAP.	22pF	50V	CH	GRM36CH220J50PT	K22178220		1-	A	B4
C 1251	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	B4
C 1252	CHIP CAP.	56pF	50V	CH	GRM36CH560J50PT	K22178230		1-	A	B4
C 1253	CHIP CAP.	56pF	50V	CH	GRM36CH560J50PT	K22178230		1-	B	e4
C 1254	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	B4
C 1255	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	B5
C 1256	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	e3
C 1257	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	f4
C 1258	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	f4
C 1259	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	B4
C 1260	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	e4
C 1261	CHIP CAP.	0.047uF	10V	B	GRM36B473K10PT	K22108801		1-	A	B5
C 1262	CHIP CAP.	220pF	25V	CH	GRM36CH221J25PT	K22148203		1-	B	e4
C 1263	CHIP CAP.	470pF	50V	B	GRM36B471K50PT	K22178805		1-	B	e4
C 1264	CHIP CAP.	470pF	50V	B	GRM36B471K50PT	K22178805		1-	B	e4
C 1265	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	B4
C 1266	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	e3
C 1267	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	e4
C 1268	CHIP CAP.	100pF	50V	CH	GRM36CH101J50PT	K22178236		1-	B	e4
C 1269	CHIP TA.CAP.	22uF	6.3V		TEMSVA0J226M-8R	K78080047		1-	B	e4
C 1270	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	e3
C 1271	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	e3
C 1272	CHIP CAP.	20pF	50V	CH	GRM36CH200J50PT	K22178219		1-	A	D5
C 1273	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	D5
C 1274	CHIP CAP.	56pF	50V	CH	GRM36CH560J50PT	K22178230		1-	A	D5
C 1275	CHIP CAP.	56pF	50V	CH	GRM36CH560J50PT	K22178230		1-	B	d5
C 1276	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	D5
C 1277	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	B5
C 1278	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	d5
C 1279	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	C5
C 1280	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	d5
C 1281	CHIP CAP.	0.047uF	10V	B	GRM36B473K10PT	K22108801		1-	A	B5
C 1282	CHIP CAP.	220pF	25V	CH	GRM36CH221J25PT	K22148203		1-	B	d5
C 1283	CHIP CAP.	470pF	50V	B	GRM36B471K50PT	K22178805		1-	B	d5
C 1284	CHIP CAP.	470pF	50V	B	GRM36B471K50PT	K22178805		1-	B	d5
C 1285	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	D5
C 1286	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	d5
C 1287	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	c5
C 1288	CHIP TA.CAP.	22uF	6.3V		TEMSVA0J226M-8R	K78080047		1-	B	d5
C 1289	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	d5
C 1290	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	d5
C 1291	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	f4
C 1292	CHIP CAP.	0.0022uF	50V	B	GRM36B222K50PT	K22178813		1-	A	A4
C 1294	CHIP CAP.	150pF	50V	CH	GRM36CH151J50PT	K22178240		1-	A	A4
C 1295	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	B	f4
C 1297	CHIP CAP.	0.0047uF	25V	B	GRM36B472K25PT	K22148830		1-	B	f4
C 1298	CHIP CAP.	0.0047uF	25V	B	GRM36B472K25PT	K22148830		1-	B	f4
C 1299	CHIP CAP.	0.0047uF	25V	B	GRM36B472K25PT	K22148830		1-	B	f4
C 1300	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	f4
C 1301	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	f4
C 1302	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	f4
C 1303	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	f4
C 1304	CHIP CAP.	0.0022uF	50V	B	GRM36B222K50PT	K22178813		1-	B	f4
C 1306	CHIP CAP.	150pF	50V	CH	GRM36CH151J50PT	K22178240		1-	B	f4
C 1307	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	B	f4
C 1308	CHIP CAP.	0.0047uF	25V	B	GRM36B472K25PT	K22148830		1-	B	f4
C 1309	CHIP CAP.	0.0047uF	25V	B	GRM36B472K25PT	K22148830		1-	B	f4
C 1310	CHIP CAP.	0.0047uF	25V	B	GRM36B472K25PT	K22148830		1-	B	f4
C 1311	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	A	B3
C 1312	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	A	B4
C 1313	CHIP CAP.	100pF	50V	CH	GRM36CH101J50PT	K22178236		1-	A	B3
C 1314	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	A3
C 1315	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	B3
C 1316	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	A	A1
C 1317	CHIP CAP.	0.022uF	16V	B	GRM36B223K16PT	K22128806		1-	A	A3

REF	DESCRIPTION	VALUE	V/W	TOL.	MFR'S DESIG	VXSTD P/N	VERS.	LOT	SIDE	LAY ADR
C 1318	CHIP CAP.	0.022uF	16V	B	GRM36B223K16PT	K22128806		1-	A	A3
C 1319	CHIP CAP.	0.022uF	16V	B	GRM36B223K16PT	K22128806		1-	A	A4
C 1320	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	A4
C 1321	CHIP CAP.	0.0047uF	25V	B	GRM36B472K25PT	K22148830		1-	A	A4
C 1322	CHIP CAP.	680pF	50V	B	GRM36B681K50PT	K22178807		1-	A	A4
C 1323	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	A4
C 1324	CHIP CAP.	0.022uF	16V	B	GRM36B223K16PT	K22128806		1-	A	A4
C 1325	CHIP CAP.	0.0068uF	25V	B	GRM36B682J25PT	K22148803		1-	A	A4
C 1326	CHIP CAP.	330pF	50V	B	GRM36B331K50PT	K22178803		1-	A	A4
C 1327	CHIP CAP.	0.47uF	25V	B	GRM40B474K25PT	K22140824		1-	A	A4
C 1328	CHIP CAP.	0.0047uF	25V	B	GRM36B472K25PT	K22148830		1-	A	A4
C 1329	CHIP CAP.	0.022uF	16V	B	GRM36B223K16PT	K22128806		1-	B	f4
C 1330	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	g4
C 1331	CHIP CAP.	0.0047uF	25V	B	GRM36B472K25PT	K22148830		1-	B	g4
C 1332	CHIP CAP.	680pF	50V	B	GRM36B681K50PT	K22178807		1-	B	g4
C 1333	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	g4
C 1334	CHIP CAP.	0.022uF	16V	B	GRM36B223K16PT	K22128806		1-	B	g5
C 1335	CHIP CAP.	0.0068uF	25V	B	GRM36B682J25PT	K22148803		1-	B	g5
C 1336	CHIP CAP.	330pF	50V	B	GRM36B331K50PT	K22178803		1-	B	g5
C 1337	CHIP CAP.	0.47uF	25V	B	GRM40B474K25PT	K22140824		1-	B	g5
C 1338	CHIP CAP.	0.0047uF	25V	B	GRM36B472K25PT	K22148830		1-	B	f5
C 1339	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	A3
C 1340	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	A	A2
C 1341	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	A3
C 1342	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	A	A2
C 1343	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	A2
C 1344	CHIP TA.CAP.	10uF	10V		TEMSVA1A106M-8R	K78100028		1-	A	A2
C 1345	CHIP TA.CAP.	10uF	10V		TEMSVA1A106M-8R	K78100028		1-	A	B2
C 1346	CHIP CAP.	0.047uF	10V	B	GRM36B473K10PT	K22108801		1-	A	B2
C 1347	CHIP CAP.	0.047uF	10V	B	GRM36B473K10PT	K22108801		1-	A	B2
C 1348	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	A2
C 1350	AL.ELECTRO.CAP.	100uF	16V		16V101M6X7TR2	K46120007		1-	A	A2
C 1353	AL.ELECTRO.CAP.	220uF	16V		RE2-16V221M 220UF	K40129048		1-	A	A2
C 1354	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	g2
C 1355	CHIP CAP.	0.1uF	16V	B	GRM39B104K16PT	K22124805		1-	B	f2
C 1356	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	f2
C 1357	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	f2
C 1358	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	f2
C 1359	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	f3
C 1360	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	f3
C 1361	CHIP TA.CAP.	22uF	6.3V		TEMSVA0J226M-8R	K78080047		1-	B	f2
C 1362	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	f2
C 1363	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	f3
C 1364	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	B	f3
C 1365	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	f3
C 1366	CHIP TA.CAP.	10uF	10V		TEMSVA1A106M-8R	K78100028		1-	B	f3
C 1367	CHIP TA.CAP.	10uF	10V		TEMSVA1A106M-8R	K78100028		1-	B	f3
C 1368	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	f3
C 1369	AL.ELECTRO.CAP.	470uF	10V		SMG10VB470M 470UF	K40109040		1-	A	A3
C 1370	AL.ELECTRO.CAP.	470uF	16V		RE3-16V471M 470UF	K40129066		1-	A	A3
C 1372	CHIP CAP.	0.1uF	16V	B	GRM39B104K16PT	K22124805		1-	B	f3
C 1373	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	A	B1
C 1374	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	f5
C 1375	CHIP CAP.	0.0015uF	50V	B	GRM36B152K50PT	K22178811		1-	A	B4
C 1376	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	A	A4
C 1377	CHIP CAP.	0.015uF	16V	B	GRM36B153K16PT	K22128807		1-	A	B4
C 1378	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	A	A1
C 1379	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	e1
C 1380	AL.ELECTRO.CAP.	10uF	16V		16V100M4X7TR2	K46120004		1-	A	B1
C 1381	CHIP CAP.	0.01uF	16V	B	GRM36B103K16PT	K22128804		1-	B	e1
C 1383	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	B	f4
C 1384	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	A	A4
C 1385	CHIP CAP.	22pF	50V	CH	GRM36CH220J50PT	K22178220		1-	A	A4
C 1386	CHIP CAP.	0.1uF	10V	B	GRM36B104K10PT	K22108802		1-	A	B4
C 1387	CHIP CAP.	1uF	10V	F	GRM39F105Z10PT	K22105001		1-	B	e5
C 1388	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	e5
C 1389	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	e5
C 1390	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	e5
C 1391	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	B	e5
C 1392	CHIP CAP.	47pF	50V	CH	GRM36CH470J50PT	K22178228		1-	A	B5
C 1393	AL.ELECTRO.CAP.	100uF	16V		16V101M6X7TR2	K46120007		1-	A	B2
C 1394	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	e1
C 1395	CHIP TA.CAP.	22uF	16V		TEMSVB21C226M-8R	K78120028		1-	B	e2
C 1396	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	B	e2
C 1400	CHIP TA.CAP.	10uF	10V		TEMSVA1A106M-8R	K78100028		1-	A	B2
C 1401	CHIP CAP.	0.001uF	50V	B	GRM36B102K50PT	K22178809		1-	A	B2
C 1402	CHIP CAP.	0.022uF	25V	B	GRM39B223K25PT	K22144807		1-	B	e2