Digital VHF Handheld Radio

DMR Technology, Tier-II

GENERAL	
Frequency Range	68 to 88 MHz, 136 to 174 MHz (split or full band)
TDMA	2 - Slot
Channel Capacity	255 or more (for display) 16 Channels (non-display)
Channel Spacing	12.5 KHz
Operating Voltage	7.4 V (rated) with Li-ion / Ni-MH rechargeable battery of capacity 2000 mAh or higher capacity
Average battery life for 5/5/90 duty cycles	Digital: 10 hrs or more Analog: 8 hrs or more
Frequency Stability	± 1.5 PPM or better
Antenna Impedance	50Ω
Weight	Less than 500 gms with battery
EMI/EMC	TEC GR No. TEC/EMI/TEL-001/01/FEB-09
TRANSMITTER	
RF Power Output	1 to 5 Watts (programmable)
FM Modulation	11KOF3E
Digital Modulation	4FSK
Modulation Limiting	±2.5 KHz
FM Hum & Noise	-40 db or better
Adjacent Channel Power	-60 dBc or better
Audio Response	+1, -3db
Digital Vocoder	AMBE +2
Communication Security	SAG approved for voice
RECEIVER	
Sensitivity (Analog)	0.30 µV (12db SINAD) or better
Sensitivity (digital)	0.30 µV at 5% BER or better
Adjacent Chanel Selectivity	60 db or better
Inter-modulation	70 db or better
Audio Output	Minimum 500 mW
Audio Distortion	3 % or better
ENVIRONMENTAL SPECIFICATION	
Operating Temperature	-30˚C to +55˚C
Storage Temperature	-30˚C to +60˚C
Humidity	95% non-condensing (-20˚C to +60˚C)
Vibration	MIL-STD -810 F/G
Shock	MIL-STD -810 F/G
Drop Test	MIL-STD -810 F/G
Dust	MIL-STD -810 F/G
Water intrusion	MIL-STD -810 F/G
Salt	MIL-STD -810 F/G
Rain	MIL-STD -810 F/G
High Altitude	MIL-STD -810 F/G

Digital VHF handheld Radio

DMR Technology, Tier-II

Feature wise Configuration:

Configuration VH1 (without display)

1. Simple press to talk.
2. Low battery alert.
3. Continuous Tone Coded Squelch System (CTCSS)
4. Mixed Mode Operation (analog and digital)

Configuration VH2 (with display)

1. All features of configuration VH1.
2. Any one of 2-Tone / 5-Tone/ DTMF signaling.
3. Busy Channel Lockout.
4. Selective call Decode.
5. Capable to kill / un-kill.
6. Capable of VOX hand free operation.
7. PTT ID Encode.
8. Chanel Scanning with call quieting facility.
9. Emergency SOS/SIREN
10. Talk around Mode
11. Automatic Number Identification (ANI)
12. Text messages and predefined message

Configuration VH3 (with GPS)

1. All features of configuration of VH2.

2. Should have built-in GPS feature with following specifications:

   i. Time to First Fix (TTFF) cold start: < 2 minutes
   ii. Time to First Fix (TTFF) hot start: < 20 seconds
   iii. Horizontally accuracy: < 10 meters

Digital VHF Mobile Radio

DMR Technology, Tier-II

GENERAL	
Frequency Range	68 to 88 MHz, 136 to 174 MHz (split or full band)
TDMA	2 - Slot
Channel Capacity	255 or higher
Channel Spacing	12.5 KHz
Operating Voltage	10.8 to 15.6 V DC
Frequency Stability	± 1.5 PPM or better
Antenna Impedance	50Ω
Communication interface	Ethernet / USB
Weight	Less than 2Kg
Display	Alphanumeric
VSWR	Better than 1.5
Protection	Reverse polarity and High VSWR
Communication Security	SAG approved for voice and data
DTMF	2 tone / 5 tone
EMI/EMC	TEC GR No. TEC/EMI/TEL-001/01/FEB-09
TRANSMITTER	
RF Power Output	5 to 25 Watts (programmable)
FM Modulation	11KOF3E
Digital Modulation	4FSK
Modulation Limiting	±2.5 KHz
FM Hum & Noise	-40 db or better
Adjacent Channel Power	-60 dBc or better
Audio Response	+1, -3db
Digital Vocoder	AMBE +2
RECEIVER	
Sensitivity (Analog)	0.30 µV (12db SINAD) or better
Sensitivity (digital)	0.30 µV at 5% BER or better
Adjacent Chanel Selectivity	60 db or better
Inter-modulation	70 db or better
Audio Output	Minimum 3Watts
Audio Distortion	3% or better
ENVIRONMENTAL SPECIFICATION	
Operating Temperature	-30˚C to +55˚C
Storage Temperature	-30˚C to +60˚C
Humidity	95 % non-condensing(-20˚C to +60˚C)
Shock	MIL-STD -810 F/G
Vibration	MIL-STD -810 F/G
Dust	MIL-STD -810 F/G
Water intrusion	MIL-STD -810 F/G
Salt	MIL-STD -810 F/G
Rain	MIL-STD -810 F/G
High Altitude	MIL-STD -810 F/G

Digital VHF Mobile Radio

DMR Technology, Tier-II

Feature wise Configuration:

Configuration VM1

1. Simple press to talk.
2. Continuous Tone Coded Squelch System (CTCSS)
3. Time out Timer (TOT)

Configuration VM2

1. All features of configuration VM1.
2. Any one of 2-Tone / 5-Tone/ DTMF signaling.
3. Busy channel lock out.
4. Selective call decode
5. Capable to kill / un-killed.
6. Channel Scanning with Call quieting facility.
7. Emergency SOS/SIREN
8. Automatic Number Identification (ANI)
9. Talk around Mode

Configuration VM3 (with GPS)

1. All features of configuration of VM2.

2. Should have built-in GPS with following specifications:

   (i) Time to First Fix (TTFF) cold start: < 2 minutes

   (ii) Time to First Fix (TTFF) hot start: < 20 seconds

   (iii) Horizontally accuracy: < 10 meters

Configuration VM4

1. Modem for Data Communication

Digital VHF Repeater

DMR Technology, Tier-II

GENERAL	
Frequency Range	68 to 88 MHz, 136 to 174 MHz (split or full band)
TDMA	2 - Slot
Operating Mode	Dual standard (digital & analog)
Operating Selection	Fully automatic for analog & digital
Channel Capacity	16 or more
Channel Spacing	12.5 KHz
Operating Voltage	12 V DC (10.8 to 15.6 V DC) 230 V AC ±10%, 50 ±1% Hz with float charger. Automatic switchover from AC to DC during mains failure.
Frequency Stability	± 1 PPM or better
Interface	Ethernet port for IP connectivity
Antenna Impedance	50Ω
Duty Cycle	100 %
Weight	Less than 15Kg
Display	Indicator for Transmit & Receive
VSWR	Better than 1.5
Protection	Reverse polarity
EMI/EMC	TEC GR No. TEC/EMI/TEL-001/01/FEB-09
TRANSMITTER	
RF Power Output	25 to 50 Watts (programmable)
FM Modulation	11KOF3E
Modulation Sensitivity	1 to 10 mV at 1 KHz at mic input for ± 1.5 KHz standard deviation.
Digital Modulation	4FSK
Modulation Limiting	±2.5 KHz
FM Hum & Noise	-40 dB or better
Adjacent Channel Power	-60 dBc or better
Audio Response	+1, -3db
Digital Vocoder	AMBE +2
RECEIVER	
Sensitivity (Analog)	0.30 µV (12db SINAD) or better
Sensitivity (digital)	0.30 µV at 5% BER or better
Image Rejection	65db or better
Adjacent Chanel Selectivity	60 dB or better
Inter-modulation	70 dB or better
Audio Output	Minimum 500 mW
ENVIRONMENTAL	
Operating Temperature	-30˚C to +55˚C
Storage Temperature	-30˚C to +60˚C
Humidity	95% non-condensing (-20˚C to +60˚C)
Vibration	MIL-STD -810 F/G
Drop Test	MIL-STD -810 F/G
Dust	MIL-STD -810 F/G
Water Intrusion	MIL-STD -810 F/G
Salt	MIL-STD -810 F/G
Rain	MIL-STD -810 F/G
High Altitude	MIL-STD -810 F/G

Feature wise Configuration: VHF REPEATER

CONFIGRATION	FEATURE WISE CONFIGURATION	OBSERVATION
VR1	Dedicated Repeater	