

Exhibit E: Intermec Operational Description

FCC ID: HN2MG18

COMPONENT SPECIFICATION

APPROVED SUPPLIERS

Manufacturer	Location/Telephone	855-042	Manufacturer's Designation
Motorola Incorporated	1301 E. Algonquin Road Schaumburg, IL 60196 (800) 668-6765	-001	SE2838BF5Z8

1.0 Scope: This specification describes the requirements for a 900/1800/1900 MHz, GSM/GPRS radio module as follows:

Part No.	Manufacturers Model No.	Physical Size
-001	Model g18 DV DIN Horiz.	40.5 x 80.2 x 7.5 mm

2.0 Quality Assurance: Intermec Receiving Inspection reserves the right to use AQL sampling techniques when inspecting a lot.

3.0 Packaging: Radios will be packaged in containers capable of protecting the units from damage and contamination in common carrier shipping and handling.

4.0 Markings: Radios will be labeled with the manufacturer's name and model number. Major shipping cartons will be marked to include the Intermec part number.

REVISION HISTORY

Rev.	File No.	Description of Change	Date	Approved
A	C3065	Release	12/17/01	H R E

[illegible]

5.0 Radio Specifications:

- 5.1** Frequency Band: 900 MHz (GSM), 1800 MHz (DCS), 1900 MHz (PCS)
- 5.2** Voltage: 3.0V to 6.0V measured at the I/O connector during the transmit slot (576µs out of 4.6ms)
- 5.3** Current Rating: 150µA off current
7.2 mA @ DRX 2 standby mode
3.5 mA @ DRX 9 standby mode
300mA average in call at power level 5
1.2 A peak @217Hz @ power level 5
- 5.4** Output Power: GSM Mode - power levels #19 to 5, 5 dBm to 33 dBm (per ETSI)
DCS Mode - power levels #15 to 0, 0 dBm to 30 dBm (per ETSI)
PCS Mode - power levels #15 to 0, 0 dBm to 30 dBm (per FCC)
- 5.5** SIM Card Reader Options: Internal (chip SIM CR 3/5 SIM)
External (local interface 3/5 SIM)
External (remote/DSC interface 5V only)
- 5.6** Interface Options: 9 line RS232 Sserial asynchronous 3V logic level
Vih = 2.0 to 5.5 Volts
Vil = 0.8V max.
Voh = 2.5V min. @ 100µA
Vol = 0.2V max. @ 100µA
Wizard application S/W, used to activate PDP context
- 5.7** Host Protocol: CSD mode - AT commands including GSM 07.07 and GSM 07.05
GPRS mode - AT commands per standard for GSM 07.60 and 07.07 ver 7.5.0
- 5.8** Data: Over the air transparent/non-transparent up to 1,140 bps max.
- 5.9** PC FAX: Class 1 using Winfax
- 5.10** SMS: Send and receive (PDU and block mode per GSM 07.05)
- 5.11** Voice Call: Supported I/O with external H/SET
- 5.12** Audio: Analog - full duplex I/O on interface connector
Digital - Motorola proprietary DSC Bus
Echo cancelling activated by AT for hands free audio

6.0 Environmental Ratings:

- 6.1** Operating Temperature Range: -30°C to +60°C
- 6.2** Storage Temperature Range: -40°C to +85°C
- 6.3** Physical Shock Withstand: 20 g's (11 msec. duration, 20 impacts/plane)
- 6.4** Vibration Withstand: 1.5 g's (5 to 500 Hz @ 0.1 octave/min. in each plane)

7.0 Mechanical Specifications:

7.1 Housing Material: PC/ABS plastic housing

7.2 Interface Connector: 36 position ZIF receptacle, 0.5mm pitch
28 pin dual row receptacle, 1.27mm pitch

7.3 RF Output Connector: 50Ω MMCX jack

7.4 Weight: 22 grams

8.0 Agency Approvals: FCC part 15 (Class B)

9.0 Interface Connector Pinouts:

9.1 36 Position FFC Receptacle -

Pin No.	Function	Pin No.	Function
1	TX Enable	19	SIM CR I/O Data
2	Not used	20	SIM CR Clock
3	Not used	21	TS (Turn on/standby)
4	RS232 - TXD	22	DSC - Enable
5	RS232 - RXD	23	DSC - Downlink
6	RS232 - DTR	24	DSC - Uplink
7	RS232 - DCD	25	Analog Audio GND
8	RS232 - RTS	26	GND
9	RS232 - CTS	27	GND
10	RS232 - DSR	28	GND
11	RS232 - RI	29	GND
12	Man Test	30	V _{CC} (3.0 to 6 VDC)
13	Analog Audio In	31	V _{CC} (3.0 to 6 VDC)
14	Analog Audio Out & Pwr on/off	32	V _{CC} (3.0 to 6 VDC)
15	Wake up/GPRS coverage indicator	33	V _{CC} (3.0 to 6 VDC)
16	Input I/O (custom) & SIM CR DET	34	Not used
17	SIM CR V _{CC} (3/5 VDC)	35	Not used
18	SIM CR Reset (RST)	36	Not used

9.2 28 Pin Header (-101 only)-

Pin No.	Function	Pin No.	Function
1	V _{CC} (3.0 to 6 VDC)	15	No Connection
2	V _{CC} (3.0 to 6 VDC)	16	TX Enable
3	SIM CR I/O Data	17	Analog Audio GND
4	SIM CR Reset (RST)	18	Analog Audio Out & Pwr on/off
5	SIM CR V _{CC} (3/5 VDC)	19	Analog Audio In
6	SIM CR DET	20	DSC - Enable
7	RS232 - DTR	21	RS232 - DSR
8	TS (Turn on/standby)	22	DSC - Downlink
9	Man Test	23	DSC - Uplink
10	Wake up/GPRS cvrg ind	24	SIM CR Clock
11	GND	25	RS232 - TXD
12	GND	26	RS232 - RXD
13	RS232 - RI	27	RS232 - CTS
14	RS232 - DCD	28	RS232 - RTS

10.0 Outline Drawing (mm): Model g18 DV DIN Horizontal, -001 Part

