

## Solid State Personal Communication Power Amplifier

**7044 - PCM3R3S7M**
**850 – 870 MHz / 5Watts CDMA, 25Watts CW**

The PCM3R3S7M (SKU 7044) is suitable for Ultra linear Cellular ESMR & iDEN repeaters and MicroCell applications. Also suitable for CDMA, GSM and TDMA applications, this amplifier utilizes proprietary DIP™ (Direct Injection Pre-D) circuit and linear LDMOS power devices that provide ample output power margins, high gain, wide dynamic range, and excellent group delay and phase linearity. Exceptional performance, long term reliability, and high efficiency are achieved by employing advanced matching networks and combining techniques, EMI/RFI filters, machined housings, and qualified components. This rugged module is input overdrive and output isolator protected, and proprietary ALC circuits ensure stable, ripple free output power under multi-channel conditions. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.



- Solid-state Class AB linear design
- Small form factor and lightweight
- Suitable for CW, ESMR, iDEN, GSM, TDMA & multi FA CDMA
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built in Output Isolator
- Built in control, monitoring and protection circuits

### ELECTRICAL SPECIFICATIONS @ +28 VDC, 25°C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	850		870	MHz
Output Power CW	P <sub>SAT</sub>	40			Watt
Output Power @ 1 dB Gain Compression Point	P <sub>1dB</sub>	25			Watt
Output Power CDMA	P <sub>CDMA</sub>	5			Watt
Small Signal Gain	G <sub>SS</sub>	44	46	48	dB
Gain Flatness (ALC On)	ΔG			±0.5	dB
Third Order Intercept Point 2-Tones, P <sub>OUT</sub> = 5 W Avg., Δ = 500 KHz	IP3	+58	+59		dBm
Input/Output Return Loss	S <sub>11</sub> / S <sub>22</sub>			-14	dB
Noise Figure	NF		7	10	dB
Harmonics @ P1 dB Gain Compression Point	H			-45	dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V <sub>DC</sub>	26	28	30	Volt
Supply Current @ P <sub>OUT</sub> = 25 W CW	I <sub>DD</sub>		3.0		Amp
Supply Current @ P <sub>OUT</sub> = 5 W Composite	I <sub>DD</sub>		2.0	2.5	Amp

### MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions	5.0 x 3.75 x 1.0	Inch	Max
Weight	1.0	lb.	Max
RF Connectors In/Out	SMA Female		
DC Connectors	D-sub, 9 Pins, Male		
Cooling	External Heatsink		

## Solid State Personal Communication Power Amplifier

**7044 - PCM3R3S7M**
**850 – 870 MHz / 5Watts CDMA, 25Watts CW**

### ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	Tc	-20		+75	°C
Storage Temperature	Tstg	-40		+85	°C
Relative humidity (non-condensing)	RH			95	%
Altitude (MIL-STD-810F Method 500.4)	ALT		30,000		Feet
Vibration	VI	MIL-STD-810F Method 514.5 Proc I random sinusoidal Category 4 or 9 or 13			
Shock	SH	MIL-STD-810F Method 516.4 Proc I Operational: Acceleration (A) of 20.0 g ±1.5 g with Duration of 11.0 ms ±1.0 ms shock pulse. Non-Operational: Impact shocks of 25 g ±3.0 g with Duration of 11.0 ms ±1.0 ms shock pulse.			

### PROTECTIONS

Input Overdrive	+6 dBm	Max
Over Power Shutdown (Optional)	45 dBm	Min
Load VSWR @ 25 W output power	∞ @ all load phase & amplitude	Nom
Thermal Overload	85°C shutdown	Max

### INTERFACE CONNECTORS

#### D-Sub, 9-Pin

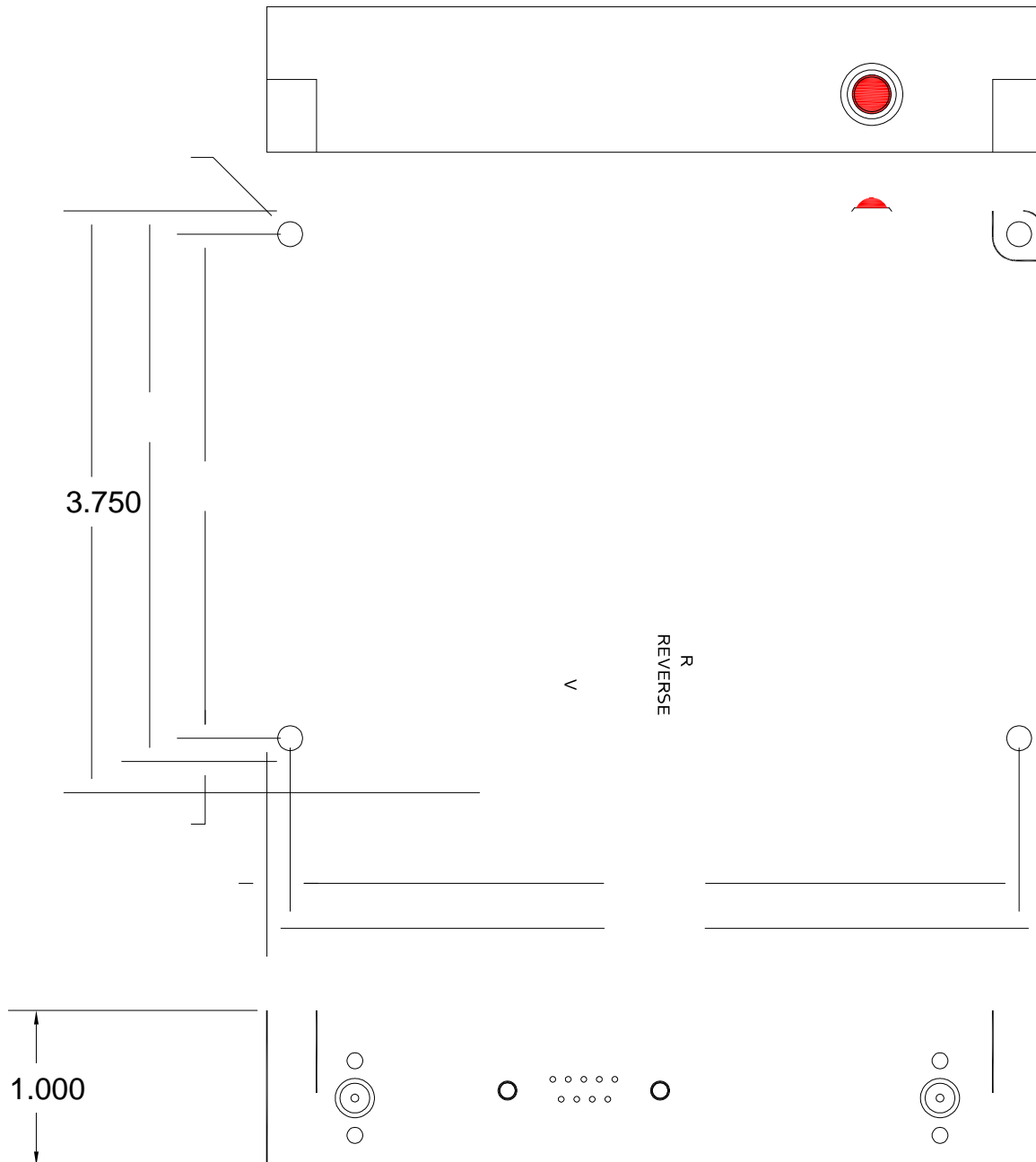
Pin #	Description	Specifications
1	Forward Power Monitor	Continuous Analog voltage relative to forward power via RMS detector FWD: 20 – 40 dBm @ 0 – 5 V (200 mV/dB) 30 dBm output = $V_{FWD} = 2.5 V_{DC}$
2	Reverse Power Monitor	Continuous Analog voltage relative to reflected power via RMS detector REVM: 17 – 37 dBm @ 0 – 5 V (150 mV/dB)
3	ALC ON/OFF	ALC ON = TTL "Low" ALC OFF = TTL "High"
4	ALC Level	Continuous adjustable range via analog input levels Setting Point (ASP): 30 – 40 dBm @ 0 – 5 V (300 mV/dB) Error Range (AER): ±1.5 dB Response Time (ART): 100 mS/dB
5	Mute	Amplifier Enable: TTL "Low" Amplifier Disable: TTL "High"
6	+VDD	+28 V <sub>DC</sub> ± 2 V
7	+VDD	+28 V <sub>DC</sub> ± 2 V
8	GND	Ground
9	GND	Ground
<b>LED</b>	LED Indicator	Output Power level indicator referenced to ALC setting

# Solid State Personal Communication Power Amplifier

7044 - PCM3R3S7M

850 – 870 MHz / 5Watts CDMA, 25Watts CW

## OUTLINE DRAWING



# Solid State Personal Communication Power Amplifier

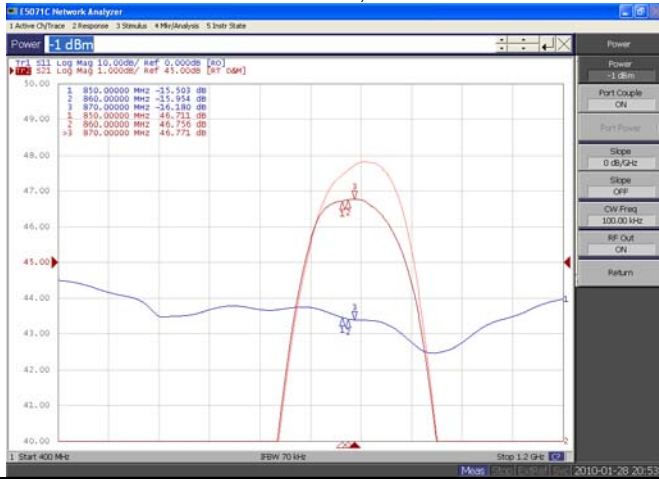
7044 - PCM3R3S7M

850 – 870 MHz / 5Watts CDMA, 25Watts CW

## TYPICAL PERFORMANCE PLOTS

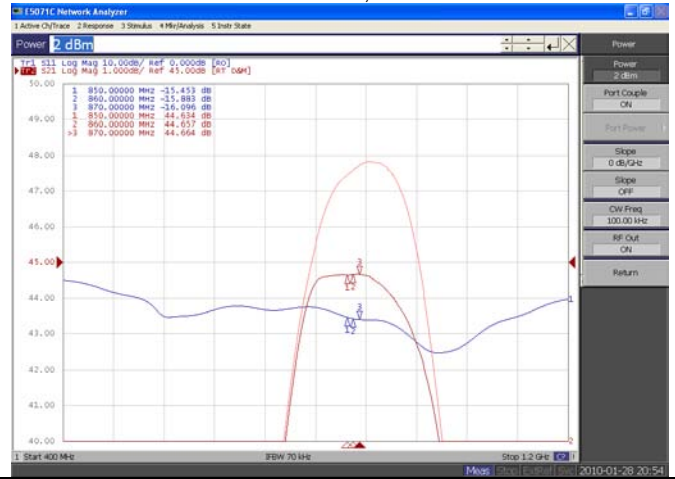
### Plots 1 - Small Signal and $P_{1dB}$ Gain

Top Curve: Small Signal Gain @  $P_{IN} = -20dBm$   
 Middle Curve: Power Gain @  $P_{1dB}$ ,  $P_{IN} = -1dBm$   
 Reference: 45dB, 1dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



### Plot 2 - Small Signal and $P_{SAT}$

Top Curve: Small Signal Gain @  $P_{IN} = -20dBm$   
 Middle Curve:  $P_{SAT}$  @  $P_{IN} = +2dBm$   
 Reference: 45dB, 1dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



### Plot 3 - ALC Flatness @ 10W & 2W

Top Curve: ALC @ 40dBm,  $P_{IN} = 0dBm$   
 Bottom Curve: ALC @ 33dBm,  $P_{IN} = 0dBm$   
 Reference: 37dB, 1dB/div.  
 Middle Curve: Input Return Loss  
 Reference: -10dB, 10dB/div.

