

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 @ +28V_{DC}, 25°C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	850		870	MHz
Output Power CW	P _{SAT}	40			Watt
Output Power @ 1dB Gain Compression	P _{1dB}	25			Watt
Output Power CDMA	P _{CDMA}	5			Watt
Small Signal Gain	G _{SS}	44	46	48	dB
Gain Flatness (ALC On)	ΔG			±0.5	dB
Third Order Intercept Point 2-Tone @ P _{OUT} = 5W Avg., 500kHz Spacing	IP3	+58	+59		dBm
Input/Output Return Loss	S ₁₁ / S ₂₂			-14	dB
Noise Figure	NF		7	10	dB
Harmonics @ P _{OUT} = 25W	H			-45	dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V _{DC}	26	28	30	Volt
Current Consumption @ P _{OUT} = 25W CW	I _{DD}		3.0		Amp
Current Consumption @ P _{OUT} = 5W Composite	I _{DD}		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 Input / Output	Type-SMA, Female		
DC Interface Connector	D-Sub 9-Pin, Male		
Cooling	External Heatsink (not supplied)		

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _C	-20		+75	°C
Storage Temperature	T _{STG}	-40		+85	°C
Relative Humidity (non-condensing)	RH			95	%
Altitude (MIL-STD-810F Method 500.4)	ALT			30,000	Feet
Vibration/Shock MIL-STD-810F – Method 514.5/516.4 – Proc I	VI/SH		Airborne		

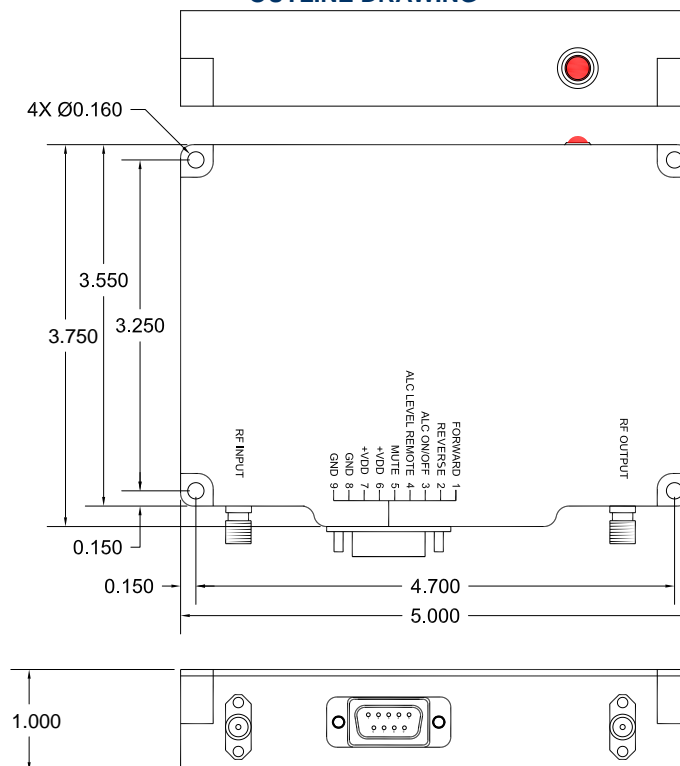
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LIMITS

Input RF drive level without damage	+6 dBm	Max
Load VSWR @ P _{OUT} = 25W	∞ @ all load phase & amplitude	-
Thermal Overload	85°C shutdown	Max

DC INTERFACE CONNECTOR – D-Sub 9-Pin, Male

Pin #	Description	Specifications
1	Forward Power Monitor	Continuous Analog voltage relative to forward power level 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 level REVM: 17 – 37 dBm @ 0 – 5 V (150 mV/dB)
3	ALC ON/OFF	ALC ON: TTL Logic Low (Internally Pulled-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 Disable: TTL Logic High (5V) (Internally Pulled-low)
6&7	+VDD	+27.0 – 29.0V _{DC}
8&9	GND	Ground
LED	LED Indicator	Output Power level indicator referenced to ALC setting

OUTLINE DRAWING


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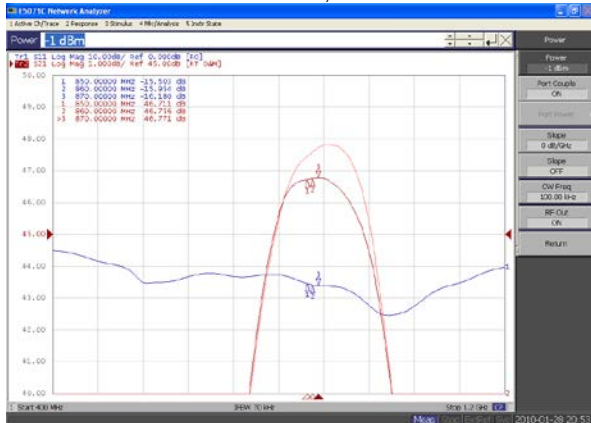
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TYPICAL PERFORMANCE PLOTS

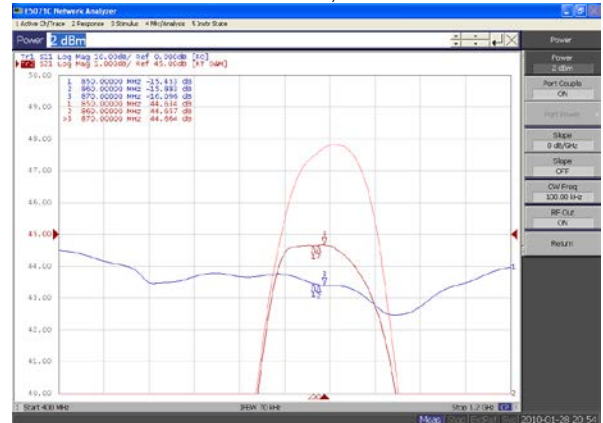
Plot 1 – Small Signal Gain and P_{1dB}

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 Gain and P_{SAT}

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: Power Gain @ 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.

