EMPOWER RF SYSTEMS, INC.

Solid State Personal Communication Power Amplifier

7083 – PCM4S5AFO

1930 – 1990 MHz / 30 Watts USPCS

The PCM4S5AFO (SKU 7083) is suitable for single and Multi-Channel CDMA base station and repeaters applications in the Cellular frequency range. Also suitable for GSM and TDMA applications, this amplifier utilizes linear LDMOS power devices that provide excellent linearity and low distortions, high gain, and wide dynamic range. Exceptional performance, long term reliability, and high efficiency are achieved by employing advanced matching networks and combining techniques (Doherty), EMI/RFI filters, machined housing, and qualified components. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

- Solid-state Pre-D linear design
- Small form factor and lightweight
- Suitable for Multi-Carrier CDMA, GSM, and TDMA Applications
- Built-in control monitoring & protection circuits
- 50 ohm input/output impedance
- Built in Output Isolator
- High reliability and ruggedness
- High efficiency
- Doherty Design

ELECTRICAL SPECIFICATIONS @ +28V_{DC}, 25°C, 50Ω System, PAR 8dB @ CCDF0.01%

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1930		1990	MHz
Small Signal Gain	G_{SS}	49	50	51	dB
Gain Flatness @ P_{IN} = -20 dBm	ΔG			±0.75	dB
Input/Output Return Loss	S_{11}/S_{22}			-20	dB
Power Output CDMA per IS-95 standard	P_{CDMA}	30			Watt
ACPR @ P_{OUT} = 44.8 dBm 7FA CDMA, IS-95, BW = 1.25 MHz Settings: RBW=30 KHz, VBW=100 Hz	Δ=1.98MHz			-44	dBc
Harmonics @ 30W 1FA CDMA,	2^{ND} / 3^{RD}			-40 / -60	dBc
Spurious Signals @ 30 Watts	Spur			-70	dBc
Operating Voltage	V_{DC}	27	28	29	Volt
Supply Current @ P_{OUT} = 30W 7FA CDMA	I_{DD}		5.0	5.5	Amp

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions – Metric (Inch)	130 x 170 x 30 mm (5.1" x 6.7" x 1.2")	Max
Weight	3.6 lbs	Max
RF Connectors Input/Output	Input: Type-SMA, Female Output: Type-N, Female	
DC Interface Connectors	Control: D-Sub 9-Pin, Male DC Power: Hybrid, D-Sub 3-Pin, Male (3W3)	
Cooling	External Heatsink (Not Supplied)	

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T_C	-30		+85	°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 514.5/516.5 – Proc I	VI/SH		Airborne		

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PROTECTIONS

Load VSWR @ P_{OUT} = 30W	∞ @ any angle & amplitude for duration of 1 minute 3:1 @ any angle & amplitude continuous	-
Thermal Overload	95°C shutdown	Max

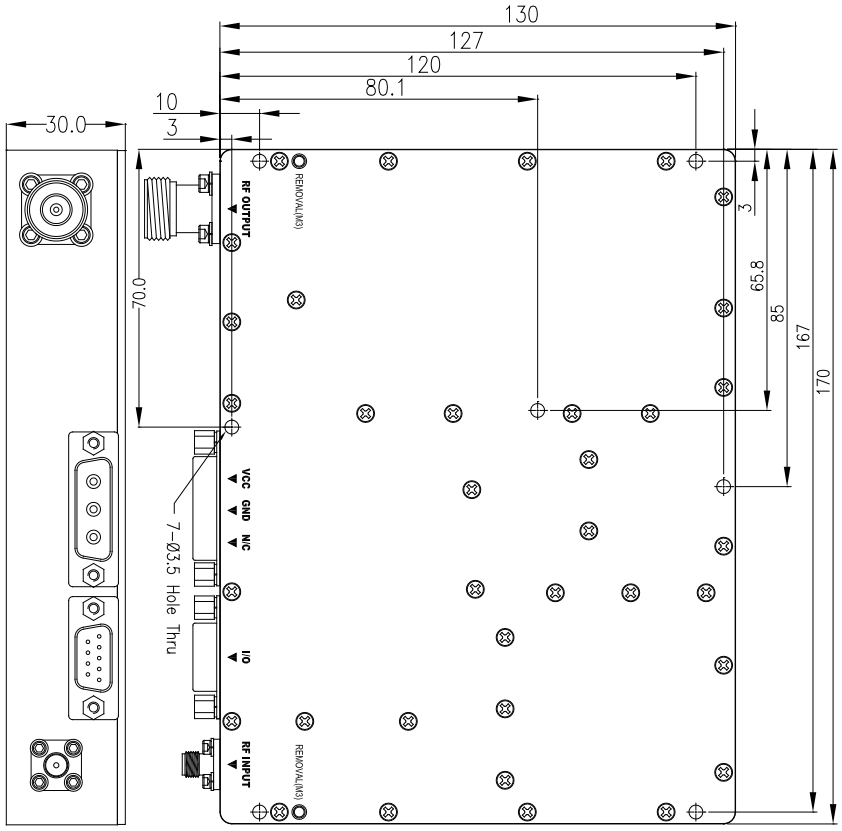
CONTROL INTERFACE CONNECTOR – D-Sub, 9-Pin, Male

Pin #	Description	Specifications
1	GND	Ground
2	Over Power Alarm	TTL Logic High (5V) @ 47dBm ±0.5dB
3	VSWR Alarm	TTL Logic High (5V) @ ≥ 3:1 VSWR
4	Temperature Monitor	Analog voltage relative to module's temperature @ (10mV/°C x Temp) + 500 mV
5	Over Temp Alarm	TTL Logic High (5V) @ 95°C shutdown, auto-restart @ 85°C (*Normally Low*)
6	Shutdown	Amplifier Enable: TTL Logic Low (0V) (*Internally Pulled-High*)
7	GND	Ground
8	Forward Power Monitor	Analog voltage relative to forward power level: +4 V @ 44.8dBm, 0.1 V/dB, 7FA CDMA
9	N/C	No Connection

DC Power Connector – Hybrid, D-Sub 3-Pin, Male (3W3)

Pin #	Description	Specifications
A1	VDD	+28 V_{DC} ±1.0 V
A2	GND	Ground
A3	N/C	No Connection

OUTLINE DRAWING



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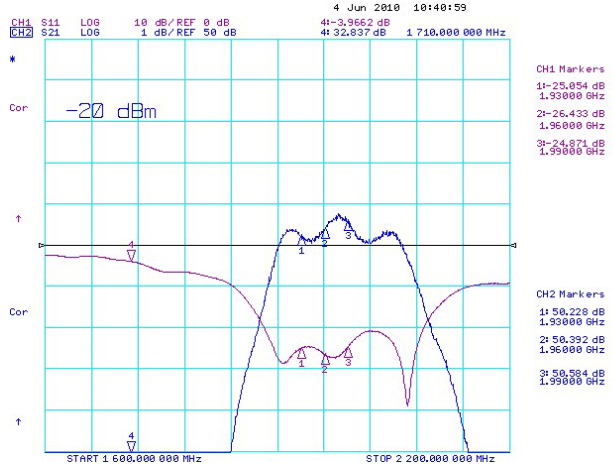
TYPICAL PERFORMANCE PLOTS

Plot 1 – Small Signal Gain

Broadband Sweep: 1600-2200MHz
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Reference: 50dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 2 – ACLR Performance @ WCDMA

ACLR @ 30W
WCDMA 2FA PAR 8dB @ CCDF0.01%
Center Frequency: 1960.00MHz