EMPOWER RF SYSTEMS, INC.

Solid State Personal Communication Power Amplifier

7113 | **791 –821 MHz / 16 Watts 3GPP W-CDMA**

The 7113 is designed for single and multi-channel 3GPP W-CDMA repeater applications in the UMTS frequency range. This amplifier utilizes linear LDMOS power devices that provide high gain, wide dynamic range, low distortions, and excellent group delay and phase linearity. Exceptional performance, long term reliability, and high efficiency are achieved by employing Direct Injection Pre-D™, advanced matching networks and combining techniques, EMI/RFI filters, machined housings, and qualified components. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

- Solid-state linearized design
- Small form factor and lightweight
- Suitable for single and multi FA W-CDMA
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built-in control and monitoring circuits
- Built-in output isolator
- High efficiency

ELECTRICAL SPECIFICATIONS @ +28V_{DC}, 25°C, 50 Ω System, PAR 8.5 dB @ CCDF0.01%

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	791		821	MHz
Small Signal Gain	G_{SS}	49	50	51	dB
Gain Flatness	ΔG		±0.50	±0.75	dB
Gain Flatness @ 42dBm				±1.0	dB
Gain variation over operating temperature range	ΔG_{TEMP}			±1.5	dB
Input Power Range	P_{IN}	-25		-2	dBm
Input/Output Return Loss	S_{11}/S_{22}			-14	dB
Power Output W-CDMA per 3 GPP standard	P_{WCDMA}	16			Watt
ACLR @ P_{OUT} = 42dBm 4-Tone W-CDMA, TM1 64 DPCH, BW = 3.84MHz PAR: 8.5dB @ CCDF 0.01% Spectrum Analyzer Settings: Res BW= 100kHz	Δ = 5MHz			-45	dBc
	Δ = 10MHz			-50	
Harmonics @ 16W, CW	H			-45	dBc
Spurious Signals @ 16W	Spur			-70	dBc
Operating Voltage(< 560mV peak-to-peak)	V_{DD}	27	28	29	Volt
Current Consumption P_{OUT} = 16W, 4FA, W-CDMA	I_{DD}		2.4	2.6	Amp

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions	110 x 170 x 28 / 4.4 x 6.7 x 1.1	mm/Inch
Weight	3.5	Max
RF Connectors Input / Output	SMA Female	
DC Interface Connectors	Control: D-sub 9-pin, Male Power: Hybrid D-sub 3-pin, Male	
Cooling	Heatsink (not supplied)	

LIMITS

Load VSWR @ P_{OUT} = 16W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 all load phase & amplitude continuous	-
Thermal Overload	95°C shutdown, auto-restart @ 85°C	Max

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ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T_C	-20		+70	°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		

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

Pin #	Description	Specification
1	GND	Ground
2	Over Power Alarm	Alarm: TTL Logic High (5V): 44dBm ±0.5dB, (*Normally Low*)
3	VSWR Alarm	Alarm: TTL Logic High (5V): ≥3:1 VSWR, (*Normally Low)*
4	Temperature Monitor	Analog voltage relative to module's temperature @ 10mV/°C with $0.5V_{OFFSET}$ Equation; $(V_{MEASURED} – 0.5)/0.01$ = °C, (e.g. 0.75V-0.5)/0.01 = 25°C
5	Over Temp Alarm	Alarm= TTL High(5V): 95°C (shutdown)
6	Shutdown	Amplifier Enable: TTL Logic Low (0V), (*Internally Pulled-high*)
7	GND	Ground
8	Forward Power Monitor	Analog: +4V @ 42dBm, 0.1 V/dB
9	N/C	No Connection

DC POWER INTERFACE CONNECTOR – Hybrid, D-Sub 3-Pin, Male

Pin #	Description	Specification
A1	VDD	$+27.0\text{-}29.0V_{DC}$
A2	GND	Ground
A3	N/C	No Connection

OUTLINE DRAWING