

Preliminary DATA SHEET

GSM1824: 1805 to 1880MHz High Linearity 24dBm Power Amplifier

Product overview

GSM1824 is a two-stage HBT small cell power amplifier for indoor cellular base stations. It works at 1805~1880 MHz (band 3). This PA can deliver 24dBm output power with ACPR below -48dBc and power gain higher than 28dB

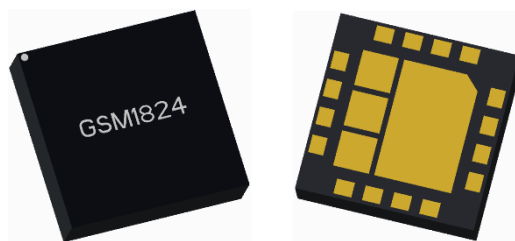


Figure 1. 16 Pad 5 x 5 mm Laminate Package

Key Features

- 1805MHz – 1880MHz
- Extend Coverage to Band 3 uplink band 1710-1785MHz, Band 2 1930-1990MHz, Band 39 1880-1920MHz, and Band 34 2010-2025MHz
- 28dB Gain
- 16% PAE at 24dBm output power
- Below -48dBc ACPR at 24dBm output power
- Input/output internally matched to 50Ohm
- Integrated temperature compensation circuits
- Compact and low-cost 5mm x 5mm LGA package (MSL3, 260°C per JEDEC J-STD-020)
- ESD Level: HBM 1000V; CDM 1000V
- ROHS compatible

Applications

- FDD and TDD 2G/3G/4G LTE/5G NR systems
- 3GPP LTE band 2,3,34,39, and 5G NR n2 n3 for base-station application
- Driver amplifier for micro-base and macro-base stations
- Active antenna array and massive MIMO
- Customer Premises Equipment (CPE)
- Automotive Compensator

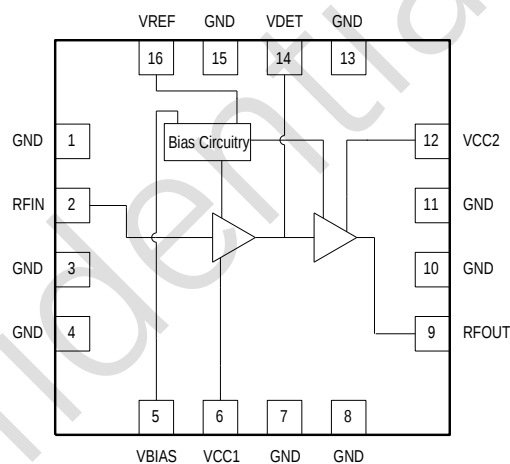


Figure 2. GSM1824 Function Block Diagram

Table 1. Pin-to-Pin Compatible PA Family

Part Num	Frequency (MHz)	3GPP Band
GSM0624	617-652	n71
GSM0724	728-821	Bands n12, n20
GSM0824	869-894	Band 5, n5
GSM0924	925-960	Band 8, n8
GSM1824	1805-1880	Band 2,3, 34,39, n2, n3
GSM2124	2110-2170	Band 1,n1
GSM2424	2300-2400	Band 40, n40
GSM2624	2496-2690	Band 41, n41
GSM3524	3300-3600	Band 42,48, n78
GSM3724	3600-3800	Band 43, 48, n78
GSM4024	3700-3980	n77, C Band
GSM5024	4600-5000	n79

Ordering Information

Part No.	Description
GSM1824	1805-1880MHz 24dBm linear PA, 7' Reel with 1500pcs

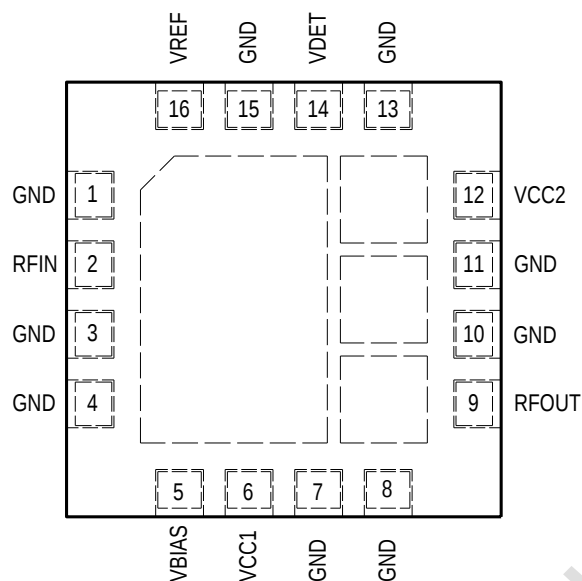


Figure 3. GSM1824 Pinout (Top View)

Table 2. GSM1824 Signal Descriptions

Pin	Name	Description	Pin	Name	Description
1	GND	Ground	9	RFOUT	RF output port
2	RFIN	RF input port	10	GND	Ground
3	GND	Ground	11	GND	Ground
4	GND	Ground	12	VCC2	Stage 2 collector voltage
5	VBIAS	Bias Voltage	13	GND	Ground
6	VCC1	Stage 1 collector voltage	14	VDET	Power detector
7	GND	Ground	15	GND	Ground
8	GND	Ground	16	VREF	Reference Voltage

Table 3. GSM1824 Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Storage Temperature	TSTG	-55 to 125	°C
Operating Temperature	TC	-40 to 105	°C
Operating Junction Temperature	TJ	175	°C
Thermal Resistance	Rθjc	27	°C/W
Operating Voltage	VCC1, VCC2, VBIAS	5.5	V
Input Power	PIN	10	dBm

Table 4. GSM1824 Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Voltage	VCC1, VCC2, VBIAS	4.5	5	5.5	V
PA enable voltage	VREF	2.8	2.95	3.2	V
PA enable current	IREF		8	15	mA
Operating frequency	f	1805		1880	MHz
Operating temperature	TC	-40	25	85	°C

Table 5. GSM1824 Electrical Specifications

(VCC1=VCC2=VBIAS=5V, VREF=2.95V, f=1840MHz, TC=+25 °C, Input /Output Load = 50Ω)

Parameter	Conditions	Min	Typ	Max	Unit
Frequency		1805		1880	MHz
Output average power			24		dBm
Output P3dB	Pulse 100us 10%	32	34		dBm
Gain @ 24dBm		26	28		dB
Power added efficiency			15		%
Quiescent current			215		mA
ACPR @ +24dBm	20MHz LTE E-TM1.1, 8.5dB PAR	-45	-50		dBc
Input return loss			-10		dB
Reverse isolation					dB
Instantaneous bandwidth			75		MHz

Table 6. GSM1824 Detector Specifications

(VCC1=VCC2=VBIAS=5V, VREF=2.95V, f=1840MHz, Signal=CW, TC=+25 °C, Input /Output Load = 50Ω)

Output Power(dBm)	Vdet(mV)	Output Power(dBm)	Vdet(mV)
27	617	21	395
26	568	20	372
25	525	19	351
24	486	18	332
23	453	17	317
22	421	RFoff	223

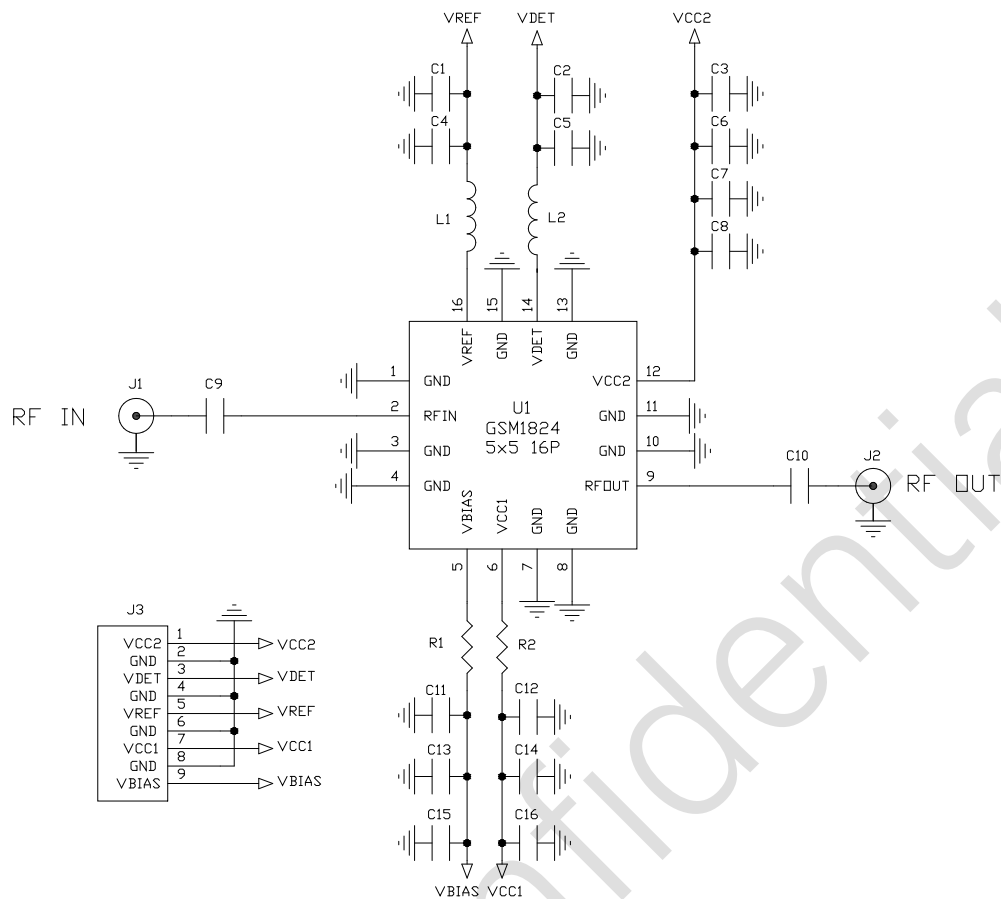


Figure 4. GSM1824 Evaluation Board Schematic

Table 6. GSM1824 Evaluation Board Bill of Materials (BOM)

Component	Description	Size
C9	47pF 25V ±10% X7R	0402/0603
C10	22pF 25V ±10% X7R	0402/0603
C1 C6 C15 C16	4.7uF 16V ±10% X7R	1206
L1 R1 R2	0R ±5% 1/16W	0402

Rest of the components on the schematic are not used in this part.

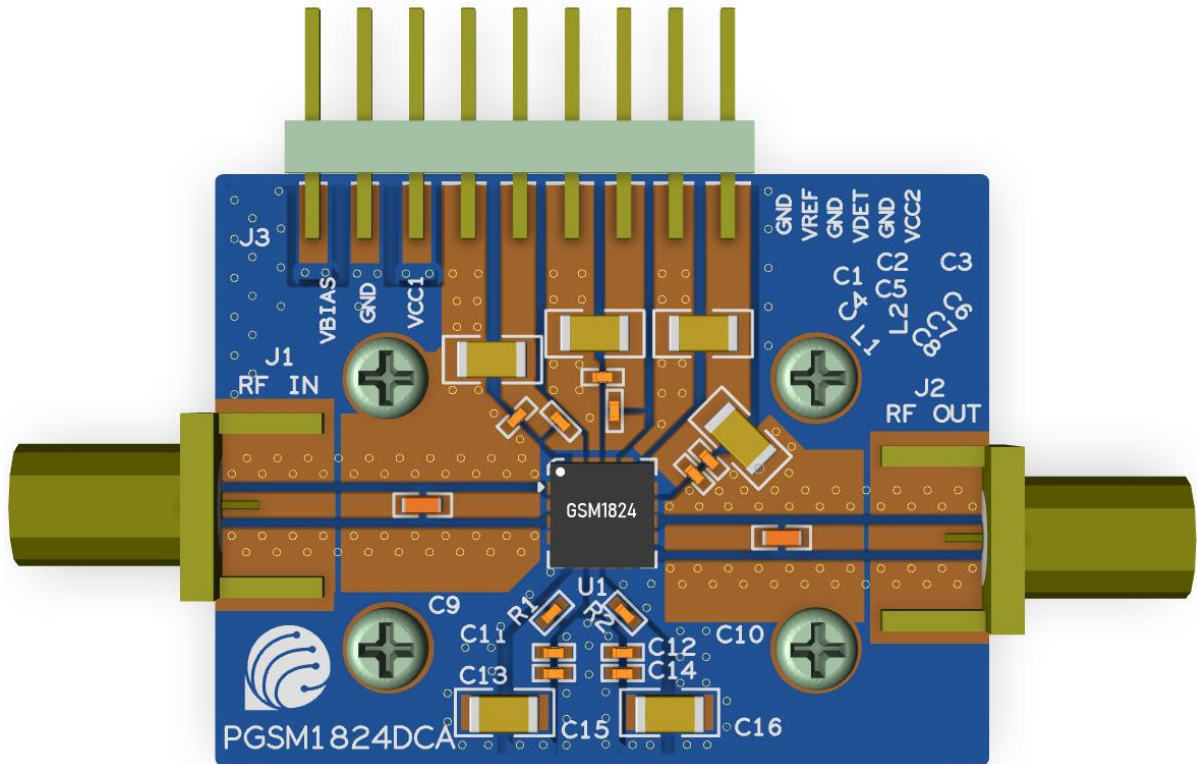


Figure 5. Evaluation board PCB information

Evaluation board test procedure

Turn-on sequence

- 1 . Connect test equipment to the input and output port of Evaluation board and then connect DC ground.
- 2 . Turn on VCC1, VCC2 to 5V, turn on VBIAS to 5V then turn on VREF to 2.95V in order.
- 3 . Apply RF signal.

Turn-off sequence

- 1 . Turn off RF signal.
- 2 . Turn off VREF, VBIAS, VCC1, VCC2 in order.

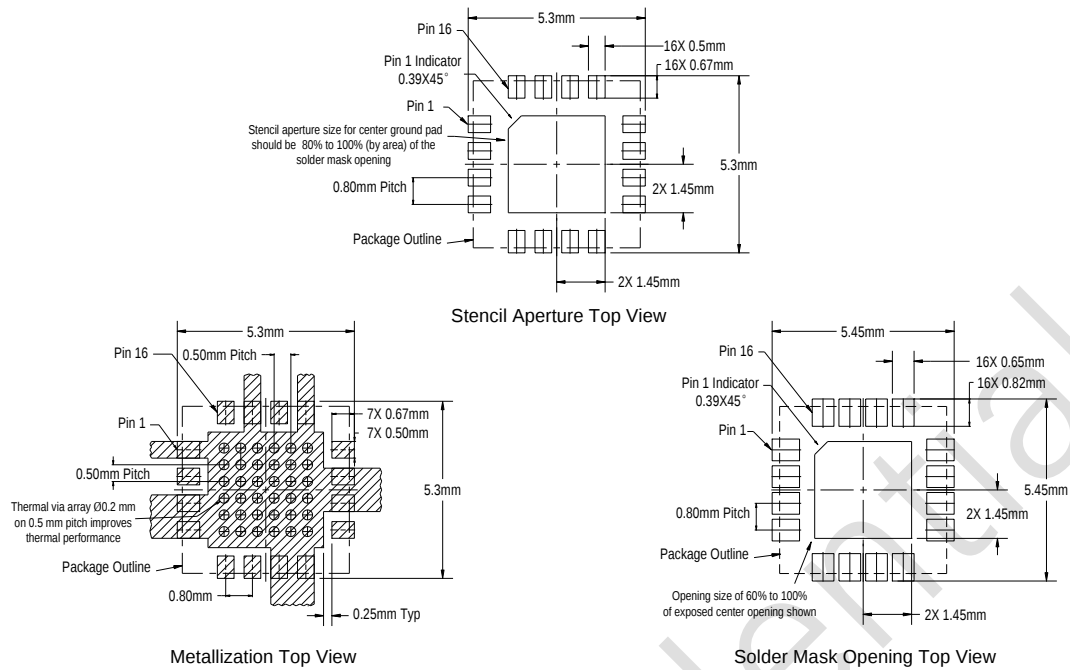


Figure 6. GSM1824 PCB Layout Footprint

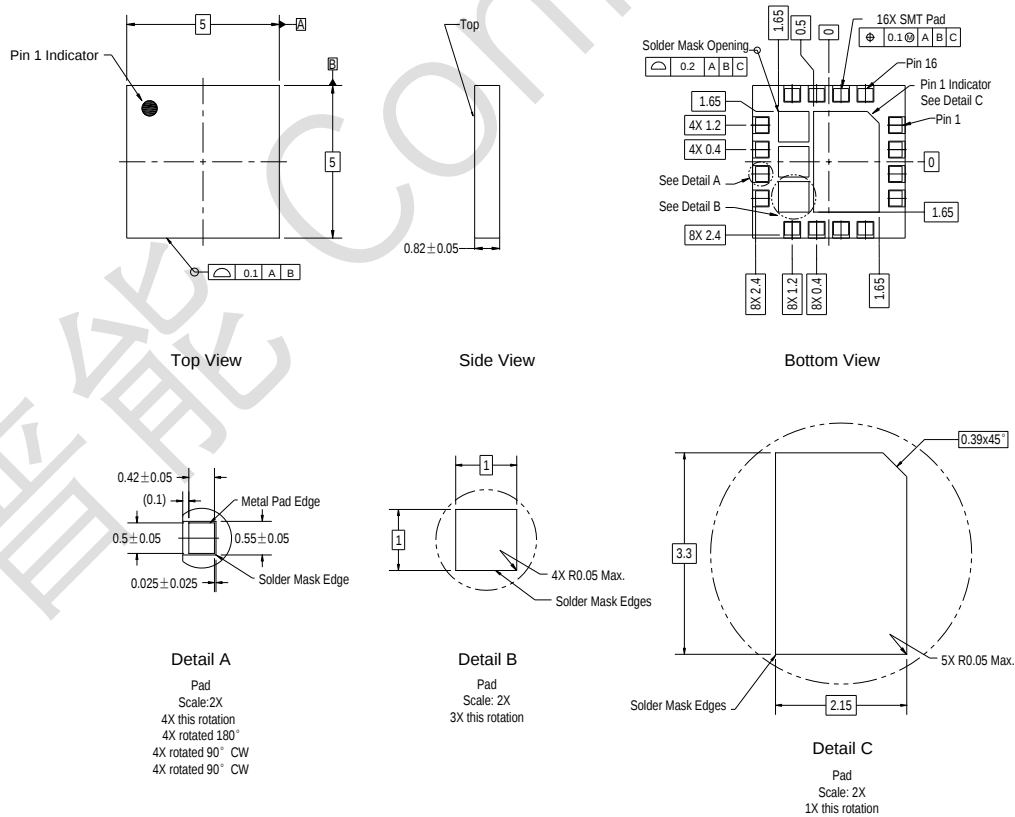


Figure 7. GSM1824 Package Dimensions



Figure 8. Typical Part Marking for the GSM1824

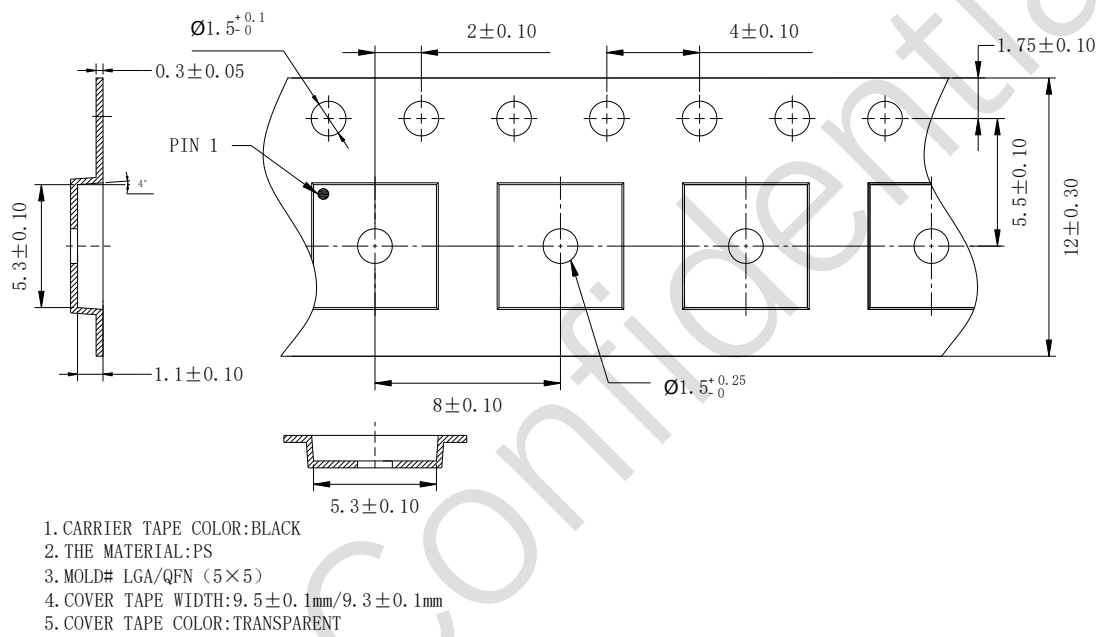


Figure 9. Tape and Reel Dimensions