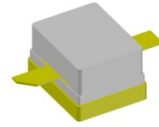


Product Features

- DC ~ 6000MHz
- 34W CW Psat @ 50V, 2450MHz
- 67% Drain Efficiency @ 50V, 2450MHz
- Excellent Ruggedness
- Excellent Thermal Stability
- Internally Matched

Applications

- Industrial Heating and Drying
- Scientific
- Medical : Skin Treatment, Blood Therapy
- Plasma Lighting



Package Type : RF01501KR3

Description

The 28W CW RF Power Transistor is designed for Industrial, Scientific, Medical (ISM) and Plasma Lighting applications at 2450MHz. This device is suitable for use in CW, pulse and linear applications. This high efficiency rugged device is targeted to replace Industrial magnetrons and other vacuum tubes currently powering industrial heating, drying, plasma lighting and medical systems.

Typical CW Peak Power Performance (V_{DS}=+50V, T_c=25°C, 50Ω)

Frequency [MHz]	Signal Type	Pin [W]	Power Gain [dB]	Drain Efficiency [%]	Pout [W]
2400.0	CW	1.0	15.9	67.3	38.2
2450.0		0.9	16.0	68.8	36.2
2500.0		1.1	15.2	71.0	36.1

Absolute Maximum Ratings

Rating	Symbol	Value	Unit	Condition
Drain to Source Voltage	V _{DSS}	150	V	T _c =25°C
Gate to Source Voltage	V _{GS}	-10, +2	V	T _c =25°C
Operating Voltage	V _{DD}	52	V _{DC}	-
Maximum Forward Gate Current	I _{GMAX}	4	mA	T _c =25°C
Maximum Drain Current ^{*1}	I _{DMAX}	1.5	A	T _c =25°C
Power Dissipation	P _{DISS}	18	W	T _c =85°C
Storage Temperature	T _{STG}	-65, +150	°C	-
Case Operating Temperature	T _C	-40, +150	°C	-
Operating Junction Temperature ^{*2}	T _J	225	°C	-
Soldering Temperature ^{*3}	T _S	245	°C	-

Note

*1 Current Limit for long term, reliable operation.

*2 Continuous use at maximum temperature will affect MTF.

*3 Refer to the Application Note(AN-002) on soldering - "Solder Condition for RFHIC's GaN Device"

Thermal Characteristics

Rating	Symbol	Value	Unit	Condition
Thermal Resistance, Junction to Case	R _{θJC}	7.61 ^{*1}	°C/W	T _c =85°C

Note

*1 Measured for the ET43028P at dissipation power is 18.4W

Electrical Characteristics (Tc=25°C unless otherwise noted)

Characteristics	Conditions	Symbol	Min	Typ	Max	Unit
DC Characteristics^{*1}						
Gate Threshold Voltage	V _{DS} = 10V	V _{GS(TH)}	-3.8	-3.0	-2.3	V _{DC}
	I _D = 3.6mA					
Gate Quiescent Voltage	V _{DS} = 50V	V _{GS(Q)}	-	-3.0	-	V _{DC}
	I _D = 50mA					
Saturated Drain Current ^{*2}	V _{DS} = 6V	I _{DS}	2.9	3.5	-	A
	V _{GS} = 2V					
Drain-Source Breakdown Voltage	V _{GS} = -8V	V _{BR}	150	-	-	V
	I _D = 3.6mA					
Gate Leakage Current	V _{GS} = -8V	I _{GLKG}	-0.79	-	-	mA
	V _{DS} = 120V					
Drain Leakage Current	V _{GS} = -8V	I _{DLKG}	-	-	1.44	mA
	V _{DS} = 120V					
RF Characteristics (F_c = 2450MHz unless otherwise noted)						
Saturated Output Power ^{*3}	V _{DS} = 50V	P _{SAT}	28	34	-	W
	I _{DQ} = 50mA					
CW Drain Efficiency ^{*3}	V _{DS} = 50V	η	63	67	-	%
	I _{DQ} = 50mA					
	P _{OUT} = P _{SAT} CW					
Output Mismatch Stress ^{*4,5}	V _{DS} = 50V	VSWR	-	-	10:1	ψ
	I _{DQ} = 50mA					
	P _{OUT} = P _{SAT} Pulsed					

Note

*1 Measured on wafer prior to packaging.

*2 Scaled from PCM data.

*3 CW(Continuous Wave) signal operation condition.

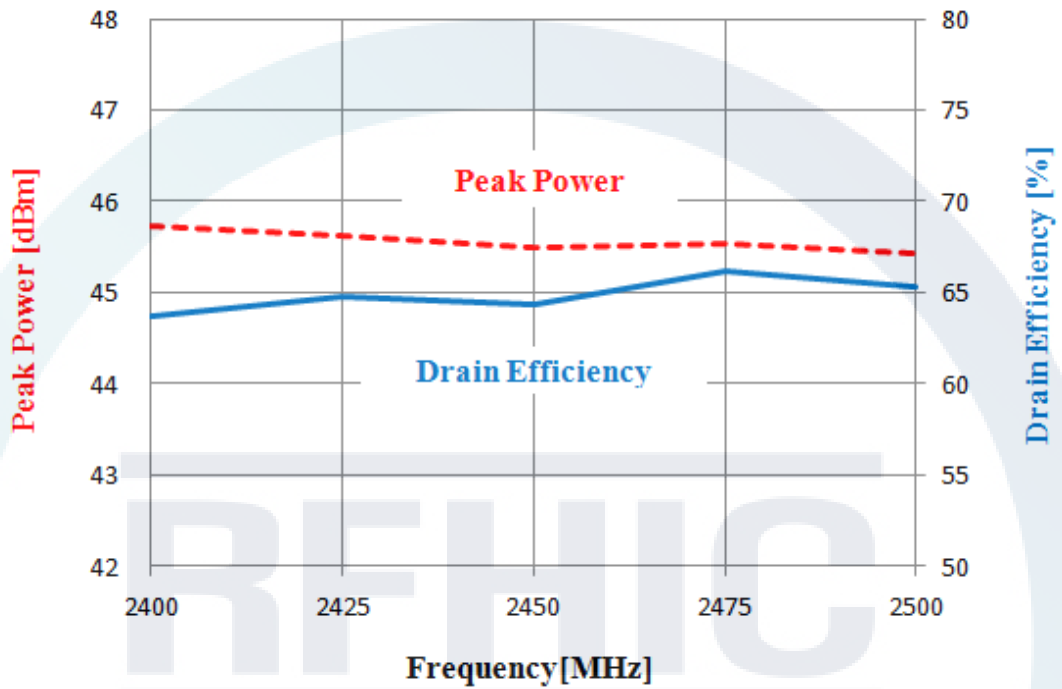
*4 Pulse width 100usec, Duty Cycle 10%.

*5 Measured in the ET43028P-2450MHz test board amplifier circuit, No damage at all phase angles.

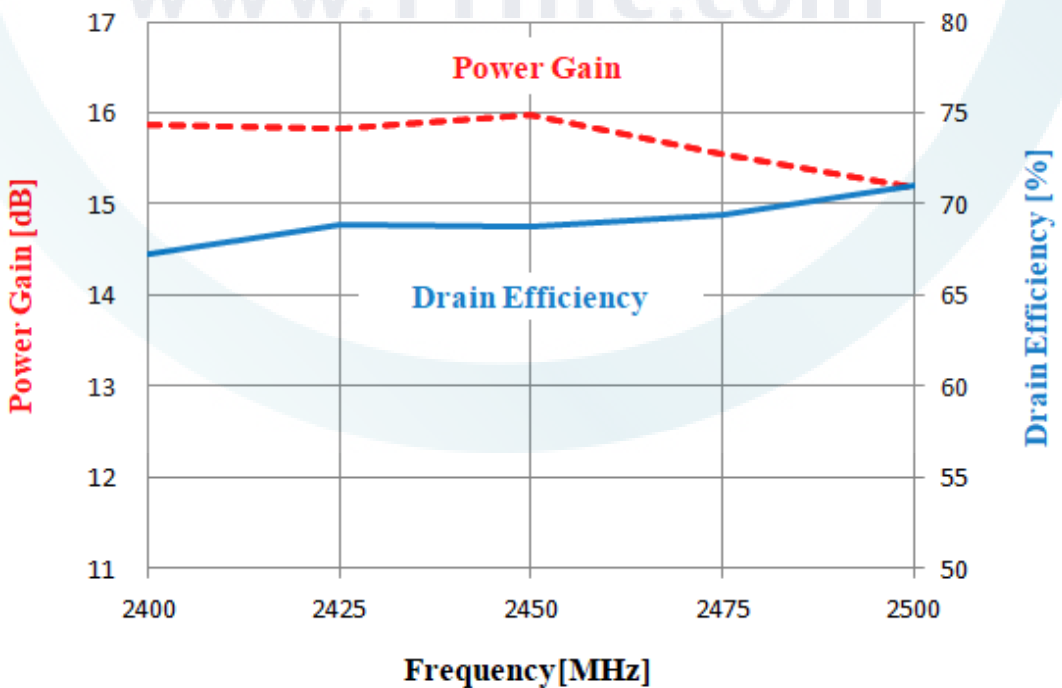
Typical CW Performance Charts

* Bias condition ($I_{DQ}=50\text{mA}$ @ $V_{DS}=50\text{V}$, $T_c=25^\circ\text{C}$)

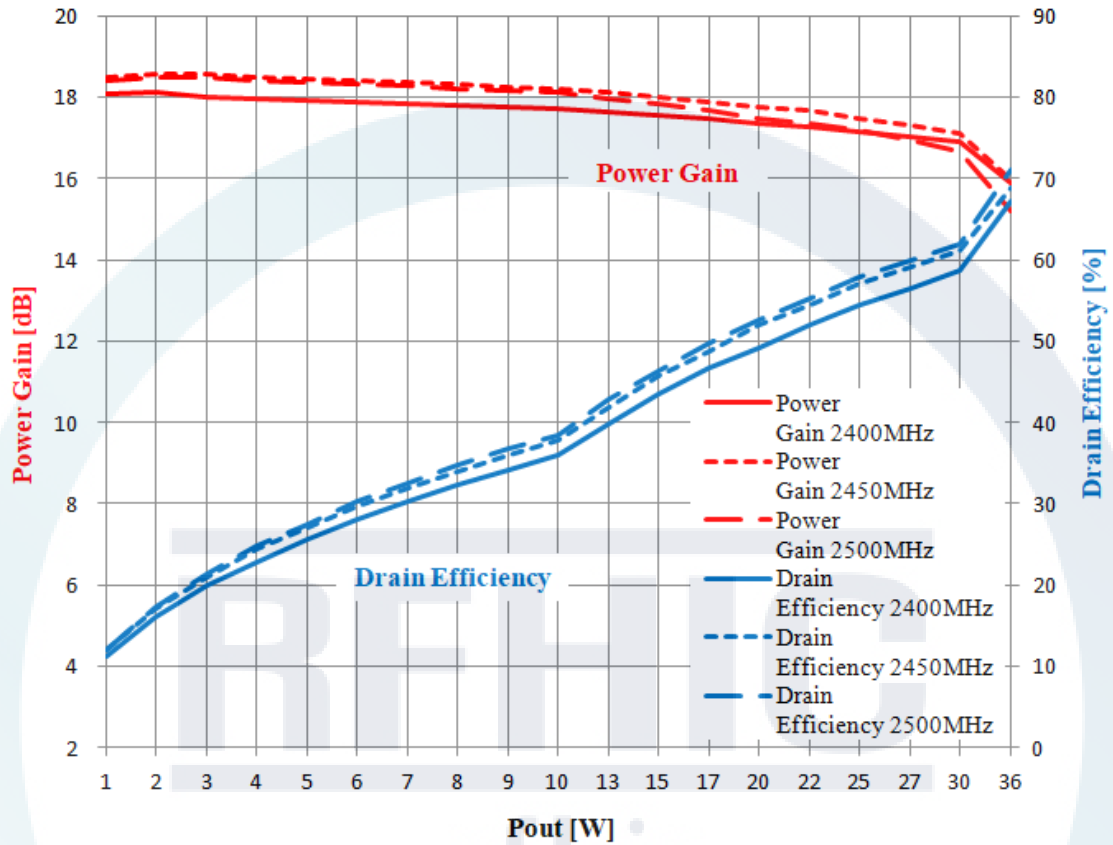
Peak Power, Drain Efficiency vs. Frequency



Power Gain, Drain Efficiency vs. Frequency

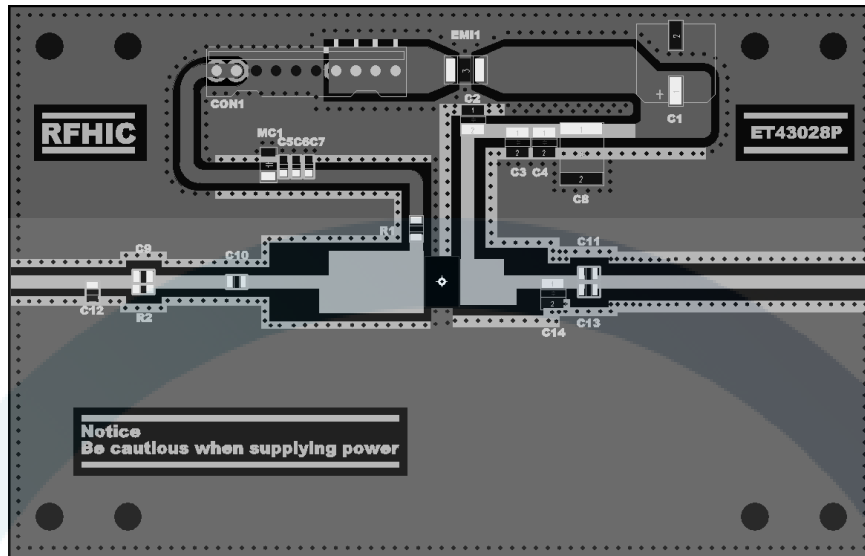


Power Gain, Drain Efficiency vs. Output Power



www.rfhic.com

Application Circuit

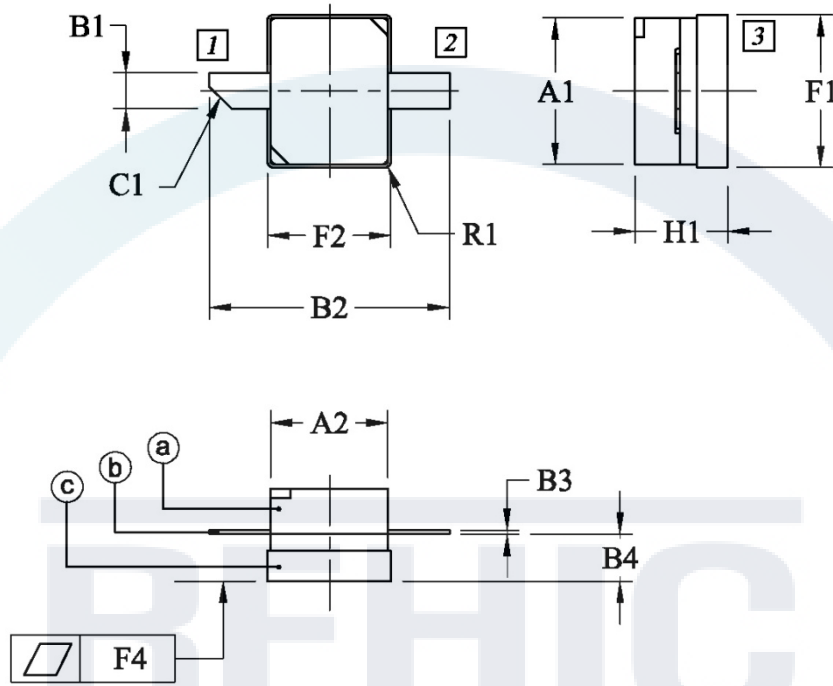


Part List

Part	Description	Part Number	Manufacturer
R1	100 Ohm Chip Resistor, 2012	MCR10EZJH101	ROHM
R2	10 Ohm Chip Resistor, 1608	MCR03EZPJ100	ROHM
C1	33uF Aluminum Capacitor	BDS100VC33MJ10TP	SAMYOUNG
C2	2.2uF, 100V MLCC	GRM32ER72A225KA35L	MURATA
C3	10pF High Q Capacitor	501CHB100JSLE	TEMEX
C4	100pF High Q Capacitor	501CHB101JSLE	TEMEX
C5	1nF Chip Capacitor	GRM188R71H102KA01D	MURATA
C6	100pF Chip Capacitor	GRM1885C1H101JA01D	MURATA
C7	10pF Chip Capacitor	GRM1885C1H100JA01D	MURATA
C8	10uF, 100V MLCC	RS80R2A106M	MARUWA
C9	10pF High Q Capacitor	201CHB100JSLE	TEMEX
C10, C12	1.5pF High Q Capacitor	201CHA1R5BSLE	TEMEX
C11, C13	3.3pF High Q Capacitor	201CHA3R3CSLE	TEMEX
C14	1.2pF High Q Capacitor	501CHB1R2CSLE	TEMEX
MC1	10uF, 16V MLCC	C3216X7R1C106K	TDK
EMI1	EMI FILTER	CTH32R102S20A-TM	MARUWA
CON1	DC Connector	22-04-1101	MOLEX
PCB	$\epsilon_r=3.5 \pm 0.05$, 0.030" (0.762mm)	RF-35TC	TACONIC.
TR1	28W GaN Transistor	ET43028P	RFHIC

Package Dimensions (Type : RF01501KR3)

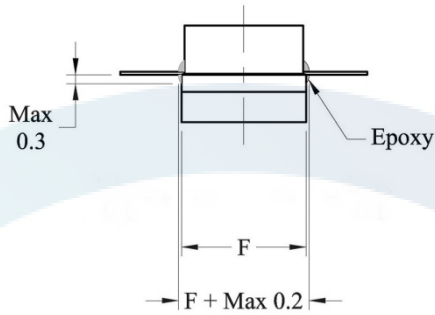
* Unit: mm[inch] | Tolerance ± 0.15 [.006]



Pin Description		Dim.	INCH			MILLIMETER		
Pin No	Function		MIN	TYP	MAX	MIN	TYP	MAX
1	Gate	A1	.188	.193	.198	4.77	4.90	5.03
2	Drain	A2	.148	.154	.159	3.77	3.90	4.03
3	Source	B1	.042	.047	.052	1.07	1.20	1.33
		B2	.295	.315	.335	7.50	8.00	8.50
		B3	.003	.005	.007	0.08	0.13	0.18
		B4	.057	.062	.067	1.445	1.570	1.695
		C1 (Chamfer)	.024	.030	.035	0.62	0.75	0.88
		F1	.196	.201	.206	4.97	5.10	5.23
		F2	.156	.161	.167	3.97	4.10	4.23
		F3	-	-	-	-	-	-
		F4	-	.001	-	-	0.03	-
		H1	.104	.126	.148	2.65	3.20	3.75
		L1	-	-	-	-	-	-
		L2	-	-	-	-	-	-
		R1 (Radius)	.004	.008	.012	0.10	0.20	0.30

- Ⓐ- Lid
- Ⓑ- Lead Frame
- Ⓒ- Flange

Sealing Epoxy Tolerance (Type : RF01501KR3)



Note
Unit : mm
F is maximum size of flange



Revision History

Part Number	Release Date	Version	Description	Data Sheet Status
ET43028P	June, 2017	0.1	Initial Release of DataSheet	Preliminary
ET43028P	October, 2017	1.0	Revision : Update Test Data	Final



RFHIC Corporation reserves the right to make changes to any products herein or to discontinue any product at any time without notice. While product specifications have been thoroughly examined for reliability, RFHIC Corporation strongly recommends buyers to verify that the information they are using is accurate before ordering. RFHIC Corporation does not assume any liability for the suitability of its products for any particular purpose, and disclaims any and all liability, including without limitation consequential or incidental damages. RFHIC products are not intended for use in life support equipment or application where malfunction of the product can be expected to result in personal injury or death. Buyer uses or sells such products for any such unintended or unauthorized application, buyer shall indemnify, protect and hold RFHIC Corporation and its directors, officers, stockholders, employees, representatives and distributors harmless against any and all claims arising out of such unauthorized use.

Sales, inquiries and support should be directed to the local authorized geographic distributor for RFHIC Corporation. For customers in the US, please contact the US Sales Team at 919-677-8780. For all other inquiries, please contact the International Sales Team at 82-31-8069-3000.