

Product Features

- Under 1GHz
- 550W CW Psat @ 50V
- 75% Drain Efficiency @ 50V
- GaN on SiC
- Excellent Ruggedness
- Excellent Thermal Stability
- Internally Matched

Applications

- Linear Accelerator Applications
- Particle Accelerators
- Free Electron Laser



Package Type : RF24001DKR3

Description

The 550W CW RF Power Transistor is designed for particle accelerator and microwave energy applications at under 1GHz. 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 particle accelerator, and medical systems.

Typical CW Peak Power Performance*1 (V_{DS}=+50V, T_c=25°C, 50Ω)

Frequency [MHz]	Signal Type	Power Gain [dB]	Drain Efficiency [%]	Pout [W]
500	CW	17	79	570
704		16.7	79.3	602
915		15	79	580

Note

*1 Measured in the IE15550DC test board amplifier circuit.

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}	84	mA	T _c =25°C
Maximum Drain Current*1	I _{DMAX}	20	A	T _c =25°C
Power Dissipation	P _{DISS}	240	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 MTTF.

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

Thermal Characteristics

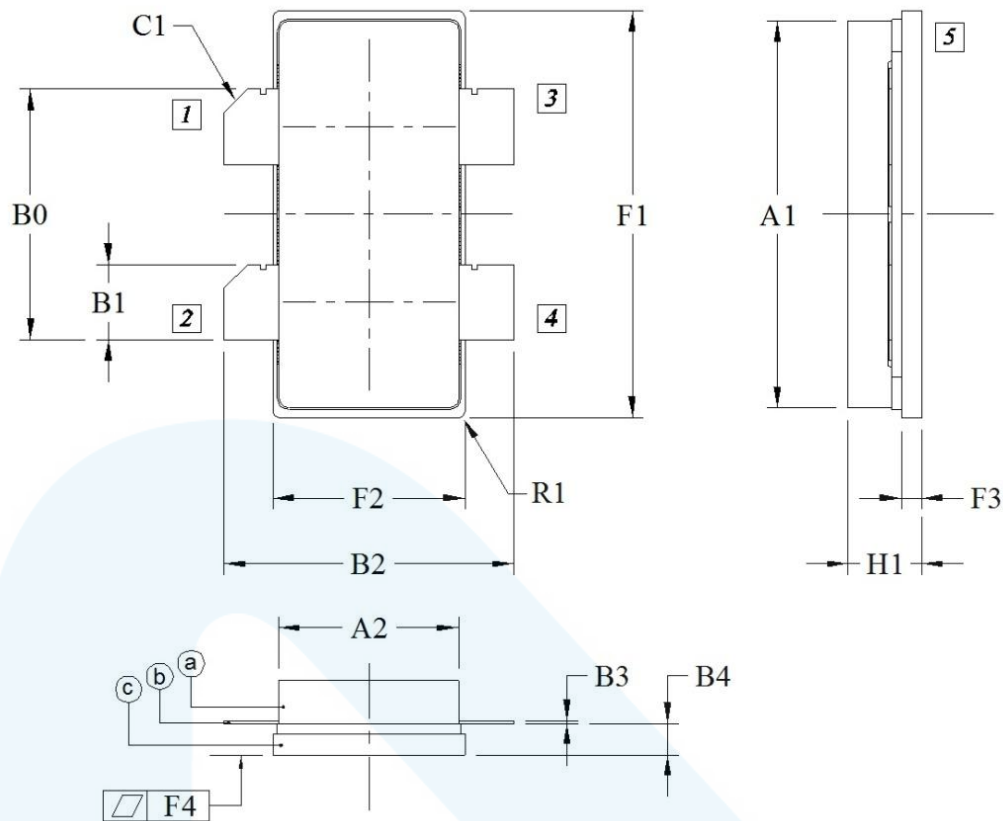
Rating	Symbol	Value	Unit	Condition
Thermal Resistance, Junction to Case	R _{θJC}	0.69 *1	°C/W	T _c =85°C

Note

*1 Measured for the IE15550DC at dissipation power is 200W

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 = 200mA					
Gate Quiescent Voltage ^{*2}	V _{DS} = 50V	V _{GS(Q)}	-	-3.0	-	V _{DC}
	I _D = 200mA					
Saturated Drain Current ^{*3}	V _{DS} = 6V	I _{DS}	69.6	83.6	-	A
	V _{GS} = 2V					
Drain-Source Breakdown Voltage	V _{GS} = -8V	V _{BR}	150	-	-	V
	I _D = 41.8mA					
Gate Leakage Current	V _{GS} = -8V	I _{GLKG}	-18.4	-	-	mA
	V _{DS} = 120V					
Drain Leakage Current	V _{GS} = -8V	I _{DLKG}	-	-	33.4	mA
	V _{DS} = 120V					
RF Characteristics (Under 1GHz)						
CW Saturated Output Power ^{*4}	V _{DS} = 50V	P _{SAT}	-	550	-	W
	I _{DQ} = 100mA					
CW Drain Efficiency ^{*4}	V _{DS} = 50V	η	-	78	-	%
	I _{DQ} = 100mA					
	P _{OUT} = P _{SAT} CW					
Output Mismatch Stress ^{*5, 6}	V _{DS} = 50V	VSWR	-	-	5:1	ψ
	I _{DQ} = 100mA					
	P _{OUT} = P _{SAT} Pulsed					



Pin Description	
Pin No	Function
1	Path A Gate
2	Path B Gate
3	Path A Drain
4	Path B Drain
5	Source

- (a) - Lid
 (b) - Lead Frame
 (c) - Flange

Dim.	INCH			MILLIMETER		
	MIN	TYP	MAX	MIN	TYP	MAX
A1	0.767	0.772	0.777	19.48	19.61	19.74
A2	0.357	0.362	0.367	9.07	9.20	9.33
B0	0.495	0.500	0.505	12.57	12.70	12.83
B1	0.145	0.150	0.155	3.68	3.81	3.94
B2	0.579	0.584	0.589	14.72	14.84	14.97
B3	0.003	0.005	0.007	0.08	0.13	0.18
B4	0.057	0.062	0.067	1.45	1.57	1.70
F1	0.806	0.811	0.816	20.47	20.60	20.73
F2	0.381	0.386	0.391	9.67	9.80	9.93
F3	0.031	0.036	0.041	0.79	0.92	1.05
F4	-	0.002	-	-	0.04	-
H1	0.127	0.148	0.170	3.22	3.77	4.32
R1 (Radius)	0.022	0.026	0.030	0.55	0.65	0.75

Revision History

Preliminary
GaN Power Transistors

Part Number	Release Date	Version	Description	Data Sheet Status
IE10550D	May, 2026	0.1	Initial Release of Datasheet	Preliminary



Certification

This product is manufactured by a company that is certified for the AS9100D quality management system.

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