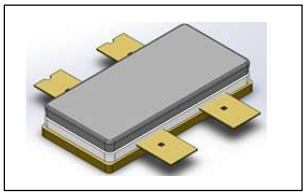
700MHz-1000MHz, 220W, 28V High Power RF LDMOS FETs

Description

The ITGH09220B4C is a 220-watt, internally matched LDMOS FET, designed for multicarrier WCDMA/PCS/DCS/LTE base station with frequencies from 700 to 1000MHz. It can be used as Doherty paired device for all typical cellular base station modulation formats.



- Typical Performance of Doherty Demo (On Innogration fixture with device soldered):

V_{DS}= 28V, I_{DQ}=200mA(Vm= 2.56V，Vp=1.5V)

Freq (MHz)	Pout (dBm)	CCDF (dB)	Ppeak (dBm)	Ppeak (W)	ACPR (dBc)	Gain (dB)	Efficiency (%)
758	45	8.48	53.48	223.0	-32.7	19.4	49
780	45	8.36	53.35	216.1	-32.1	19.2	53
803	45	8.40	53.40	218.9	-29.3	17.6	51

Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Internally Matched for Ease of Use
- Excellent thermal stability, low HCI drift
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Pb-free, RoHS-compliant

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	65	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+32	Vdc
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature	T_J	+225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 25°C,Pout=30W	$R_{\theta JC}$	0.4	°C/W

Table 3. ESD Protection Characteristics

Test Methodology	Class
Human Body Model (per JESD22--A114)	Class 2

Table 4. Electrical Characteristics (TA = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics（Main path Section）					
Drain-Source Breakdown Voltage (V_{GS}=0V; I_D=1mA)	V_{DSS}	65	70		V

Zero Gate Voltage Drain Leakage Current (V_{DS} = 28 V, V_{GS} = 0 V)	I_{DSS}			10	μA
Gate--Source Leakage Current (V_{GS} = 10 V, V_{DS} = 0 V)	I_{GSS}			1	μA
Gate Threshold Voltage (V_{DS} = 28V, I_D = 600 uA)	$V_{GS(th)}$		1.8		V
Gate Quiescent Voltage (V_{DD} = 28 V, I_{DQ} = 330 mA, Measured in Functional Test)	$V_{GS(Q)}$	2.2	2.6	3.2	V

Load Mismatch (On Innogration Test Fixture, 50 ohm system): V_{DD} = 28 Vdc, I_{DQ} = 330mA, f = 920MHz

VSWR 10:1 at 20W WCDMA 1 Carrier Output Power	No Device Degradation

Reference Circuit of Test Fixture Assembly Diagram

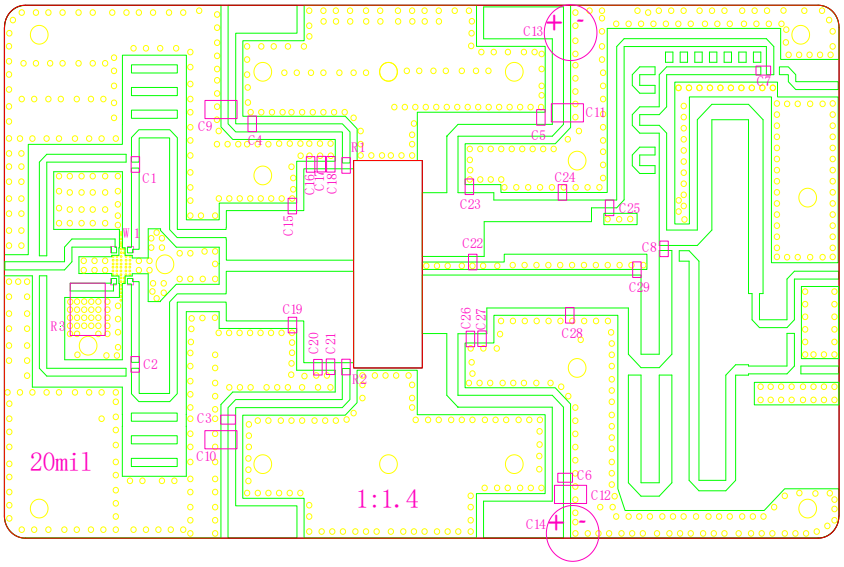


Figure 1. ITGH09220B4C Doherty Test Circuit Component Layout(758-803MHz)

Table 5. Test Circuit Component Designations and Values

Designator	Footprint	Comment	Quantity
C1, C2, C16	0805	4.7 pF	3
C3, C4, C5, C6, C7, C8	0805	100 pF	6
C9, C10	0805	4700pF/50v	2
C11, C12	1210	10uF/100V	2
C13, C14		470uF/63V	2
C15, C19, C23, C24, C25, C28, C29	0805	6.8 pF	7
C17, C18, C20, C21, C22, C27	0805	10 pF	6
C26	0805	15 pF	1
R1, R2	0603	10Ω	2
R3	2512	51Ω	1
W1		DC07F02	1

TYPICAL CHARACTERISTICS

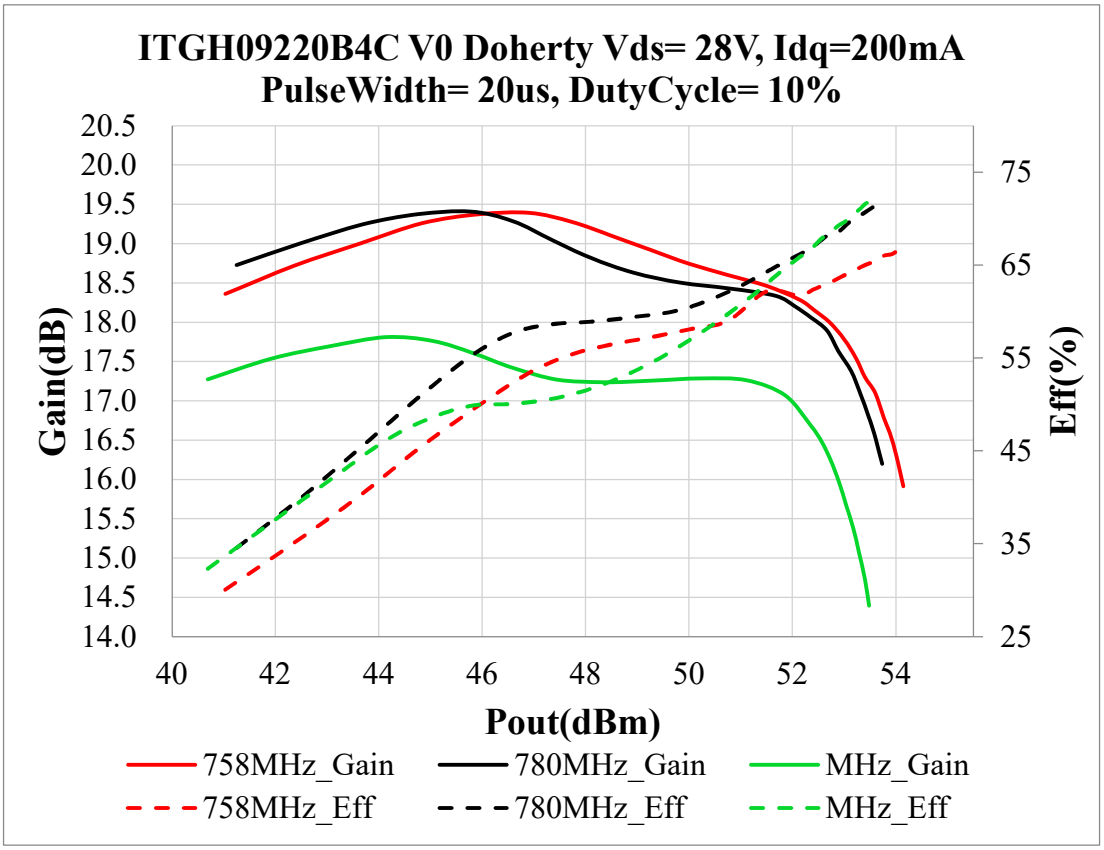


Figure 2. Power gain and drain efficiency as function of pulsed CW Pout

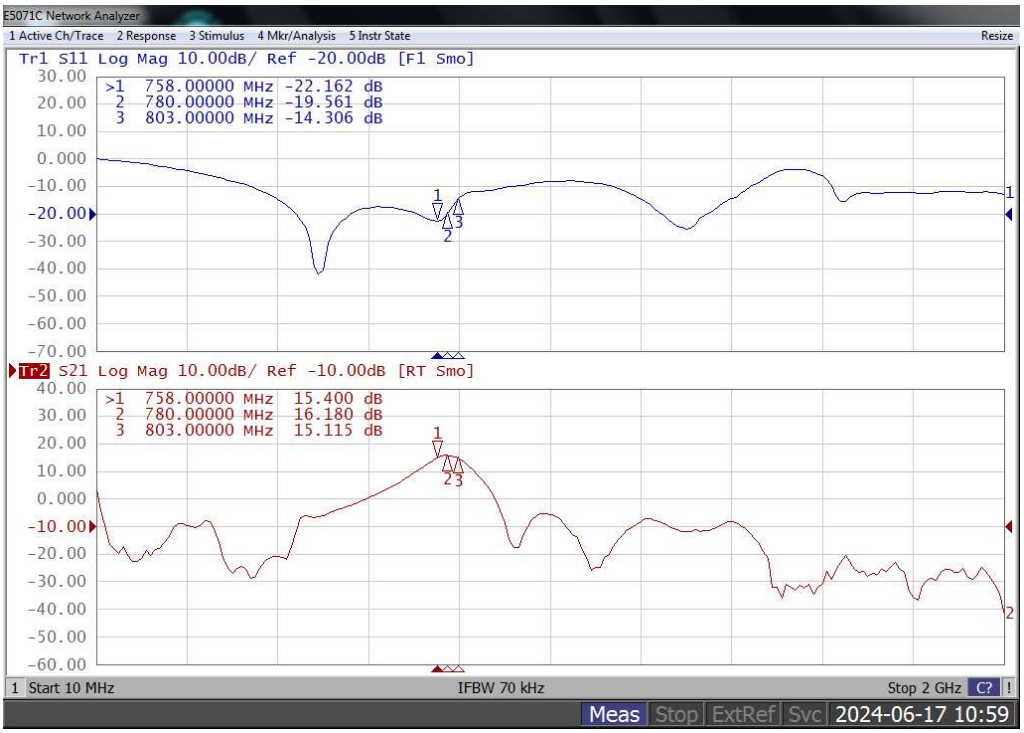
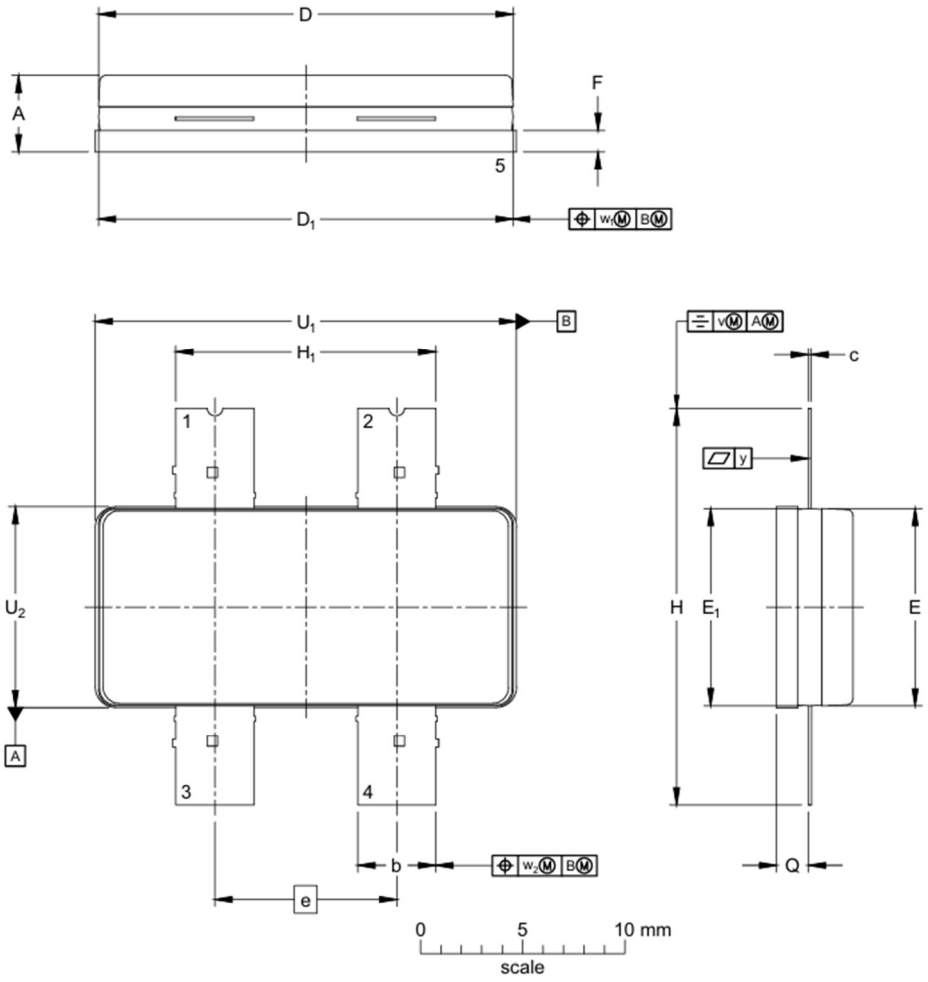


Figure 3. Broadband Frequency Response

Earless Flanged Plastic Air Cavity Package; 4 leads



Dimensions

Unit		A	b	c	D	D_1	E	E_1	e	F	H	H_1	Q(1)	U_1	U_2	v	w_1	w_2	y
mm	max	4.01	3.91	0.18	20.42	20.37	9.80	9.75		1.14	19.53	12.83	1.68	20.70	9.91	0.50	0.50	0.50	0.10
	nom								8.89										
	min	3.40	3.71	0.13	20.12	20.17	9.50	9.55		0.94	19.33	12.57	1.45	20.50	9.70				

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2024/6/18	Rev 1.0	Product Datasheet

Application data based on LSM-24-21

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