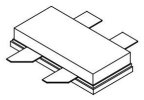
1.4-2.2GHz, 90W, 28V High Power RF LDMOS FETs

ITEH22090BY4



Description

The ITEH22090BY4 is a 90-watt, internally matched LDMOS FET, designed for multicarrier WCDMA/PCS/DCS/LTE base station and ISM applications with frequencies from 1400 to 2200MHz.

It can be configured as push pull, single ended, or Doherty.

- Typical Performance of 1.8GHz class AB Demo (On Innogration fixture with device soldered):

Vds=28V, Idq=550mA

Freq (MHz)	Signal	Pout (W)	Gain (dB)	Eff (%)
1805-1880	CW	100	17	60
	WCDMA	16	18.5	27

- Typical Performance of 2.1GHz class AB Demo (On Innogration fixture with device soldered):

Vds=28V, Idq=550mA

Freq (MHz)	Signal	Pout (W)	Gain (dB)	Eff (%)
2110-2170	CW	100	17	56
	WCDMA	16	19	27

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= 85°C,Pout=90W	$R_{\theta JC}$	0.48	°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（Half 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} = 550 mA, Measured in Functional Test)	$V_{GS(Q)}$		2.7		V

1805-1880MHz

Reference Circuit

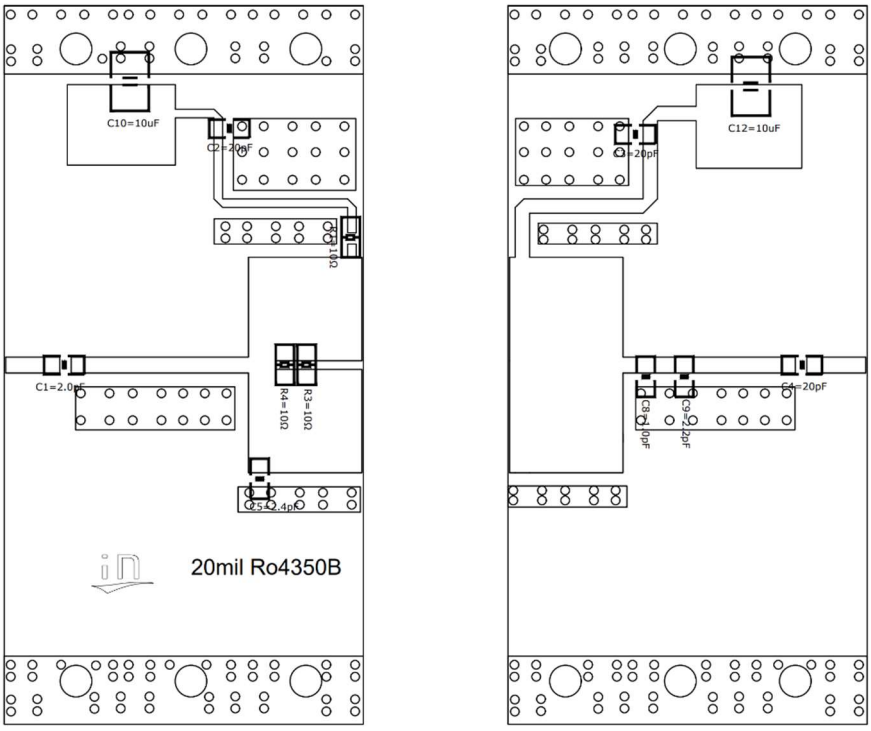


Figure 1. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

Reference	Footprint	Value	Quantity
C2, C3, C4	0603	20pF/250V	3
C1	0603	2.0pF/250V	1
C5	0603	2.4pF/250V	1
C8	0603	1.0pF/250V	1
C9	0603	2.2pF/250V	1
C10, C12	1210	10uF/100V	2
R1, R3, R4	0603	10R	3
/	BY4	ITEH22090BY4	1

TYPICAL CHARACTERISTICS

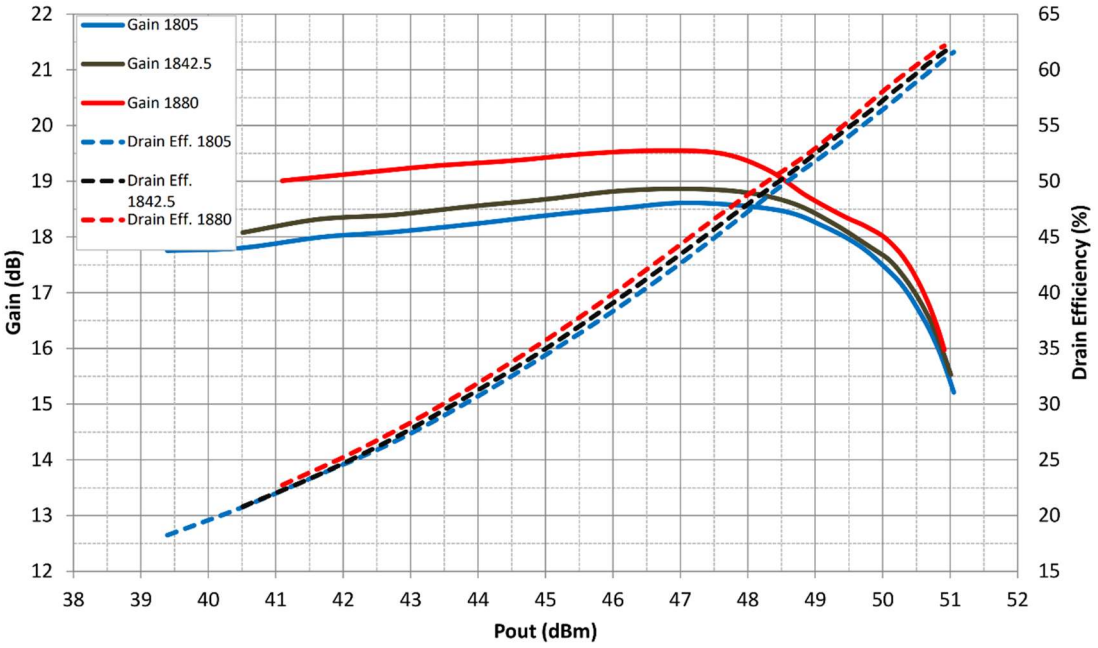


Figure 2. Power Gain and Drain Efficiency as Function of Pulse Output Power (Vds=28V, Idq=550mA)

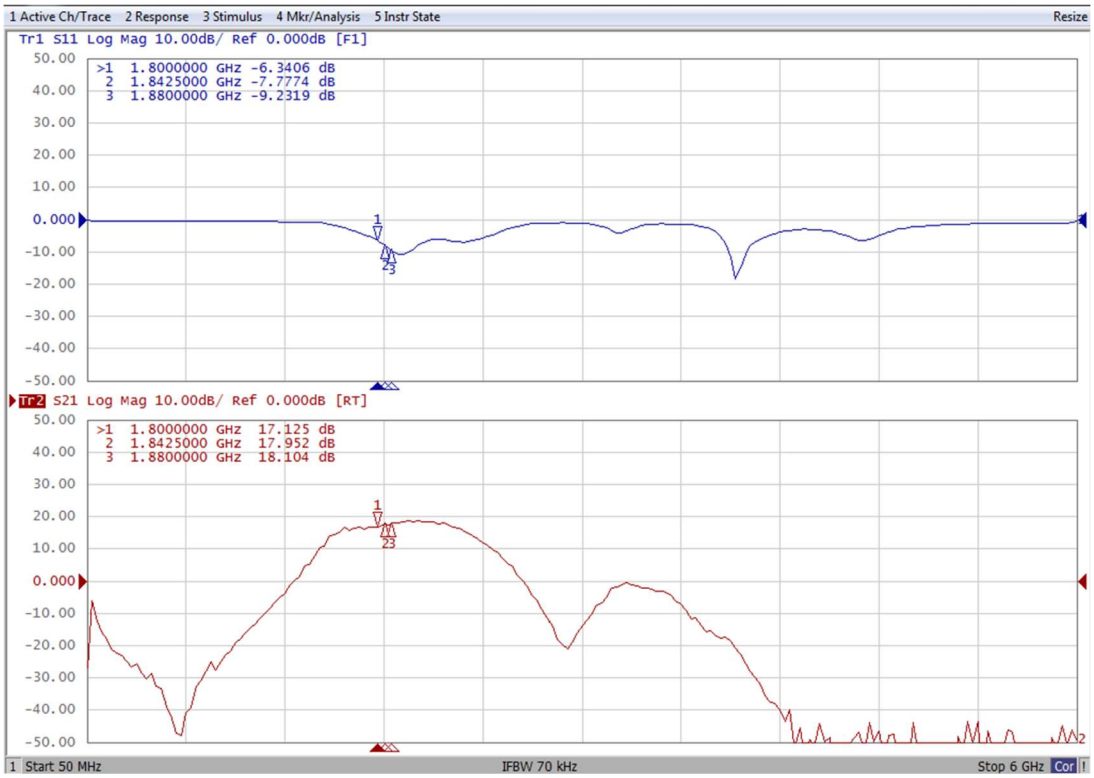


Figure 3. Network analyzer Output S11/S21

2110-2170MHz

Reference Circuit

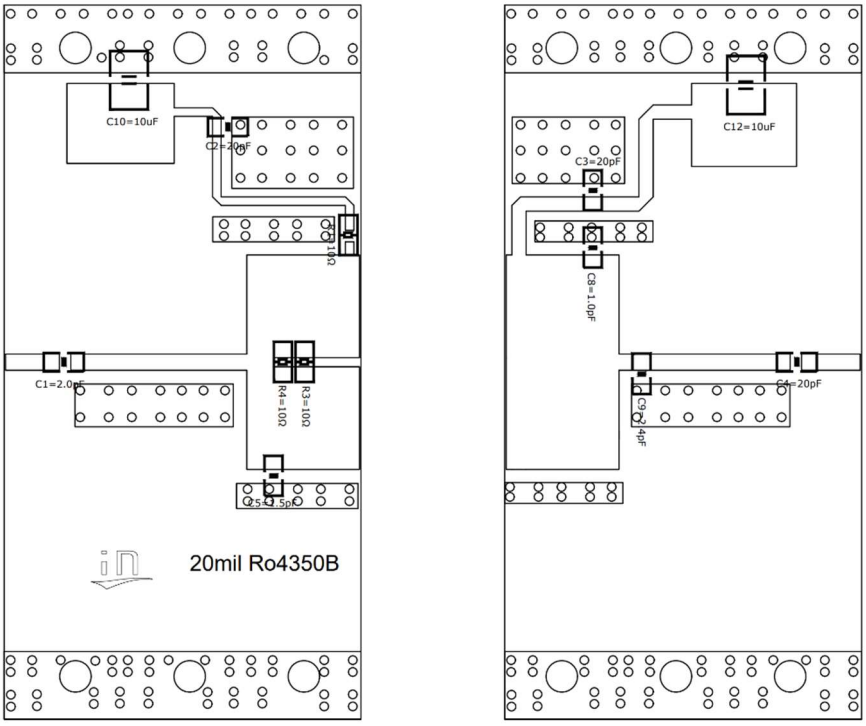


Figure 3. Test Circuit Component Layout

Table 6. Test Circuit Component Designations and Values

Reference	Footprint	Value	Quantity
C2, C3, C4	0603	20pF/250V	3
C1	0603	2.0pF/250V	1
C5	0603	1.5pF/250V	1
C8	0603	1.0pF/250V	1
C9	0603	2.4pF/250V	1
C10, C12	1210	10uF/100V	2
R1, R3, R4	0603	10R	3
/	BY4	ITEH22090BY4	1

TYPICAL CHARACTERISTICS

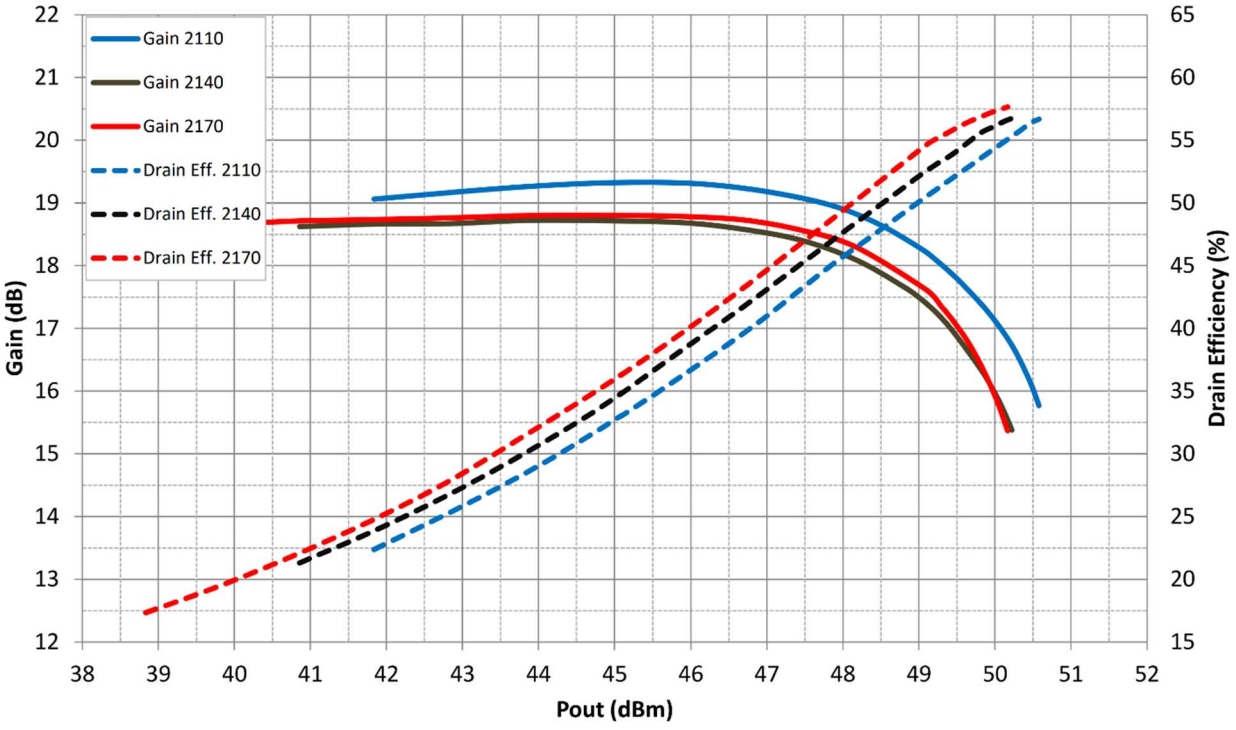


Figure 4. Power Gain and Drain Efficiency as Function of Pulse Output Power (Vds=28V, Idq=550mA)

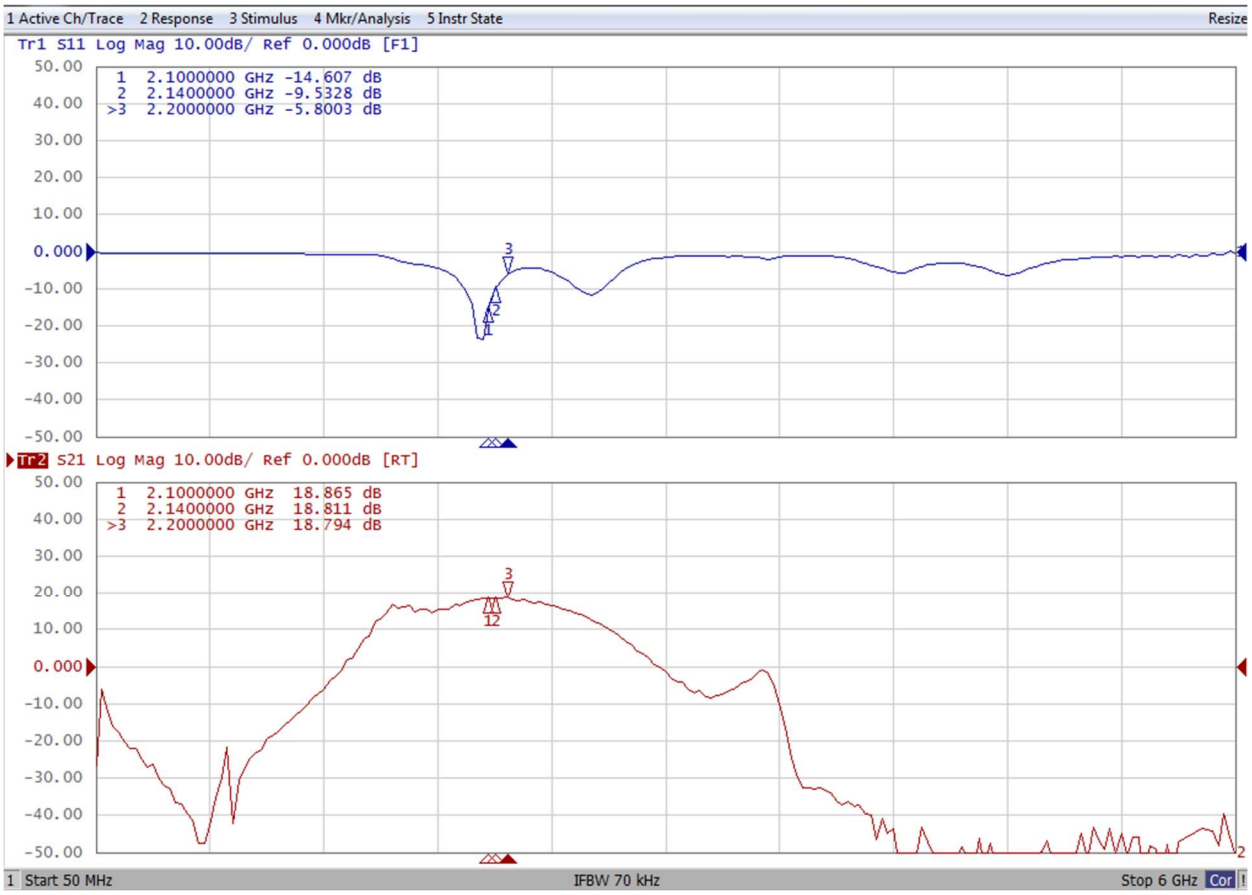
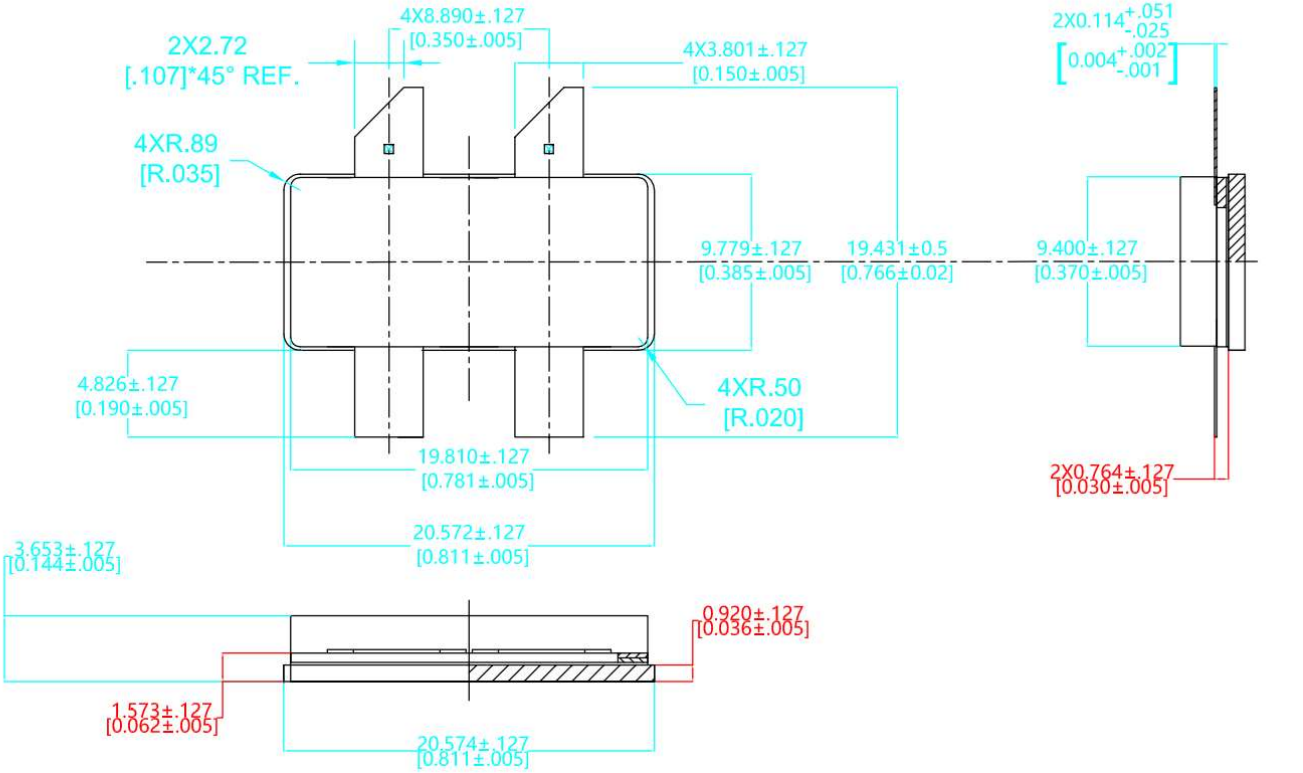


Figure 5. Network analyzer Output S11/S21

Earless Flanged Ceramic Package; 4 leads



Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2024/7/11	**Rev 1.0**	**Preliminary Datasheet**

Application data based on ZBB-24-23/24

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