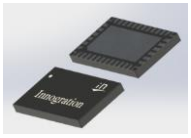
45W,28V Plastic RF LDMOS Transistor

ITEH09045C6



Description

The ITEH09045C6 is a 45-watt, highly rugged, LDMOS transistor, designed for any general applications at frequencies up to 1GHz, in 10*6mm QFN plastic package, supporting surface mounted on PCB through high density grounding vias.

It can be tuned to meet 35-36dBm WCDMA or LTE ACLR without DPD needed purely by back off operation.

- Typical 758-803MHz Class AB RF Performance (On Innogration fixture with device soldered).

V_{DS}= 28V，I_{dq}=360mA，V_{gs} =2.74V WCDMA-1C-PAR10.8					
Freq (MHz)	Pout (dBm)	CCDF (dB)	ACPR (dBc)	Gain (dB)	Efficiency (%)
758	36	9.83	-45.8	23.7	19.2
780	36	9.68	-45.7	23.8	19.8
803	36	9.62	-45.3	24.3	20.6

Features

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

Suitable Applications

- P band power amplifier
- All 4G/5G cellular application within 0.7 to 1GHz

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}	+28	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, DC test	$R_{\theta JC}$	1.9	°C/W

Table 3. ESD Protection Characteristics

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics					
Drain-Source Voltage V_{GS}=0, I_{DS}=100uA	$V_{(BR)DSS}$		65		V
Zero Gate Voltage Drain Leakage Current (V_{DS} = 28V, V_{GS} = 0 V)	I_{DSS}	——	——	1	μA
Gate--Source Leakage Current (V_{GS} = 11 V, V_{DS} = 0 V)	I_{GSS}	——	——	1	μA
Gate Threshold Voltage (V_{DS} = 28V, I_D = 600 μA)	V_{GS}(th)	——	2	——	V
Gate Quiescent Voltage (V_{DD} = 28V, I_D = 350mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.6	——	V

Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28Vdc, I_{DQ} = 350 mA, f = 800 MHz

VSWR 10:1 at 45W pulse CW Output Power	No Device Degradation

Figure 1:Pin Definition(Top View)

Pin No.	Symbol	Description
8,9,10,11,14,15,16,17	Vgs/RF In	Vgs and RF input
26,27,28,29,32,33,34,35	Vds/RF out	Vds and RF output
2,5,7,12,13,18,20,23,25,30,31,36	GND	DC/RF Ground
Others	NC	No connection
Package Base	GND	DC/RF Ground.

758-803MHz application board

Reference Circuit of Test Fixture Assembly Diagram
20mils RO4350B

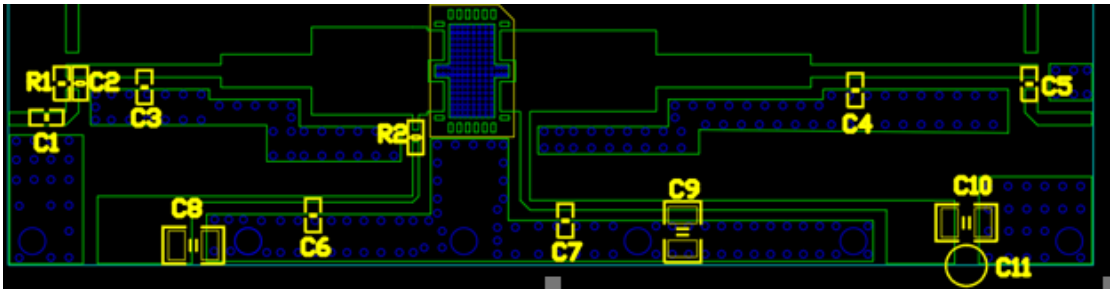
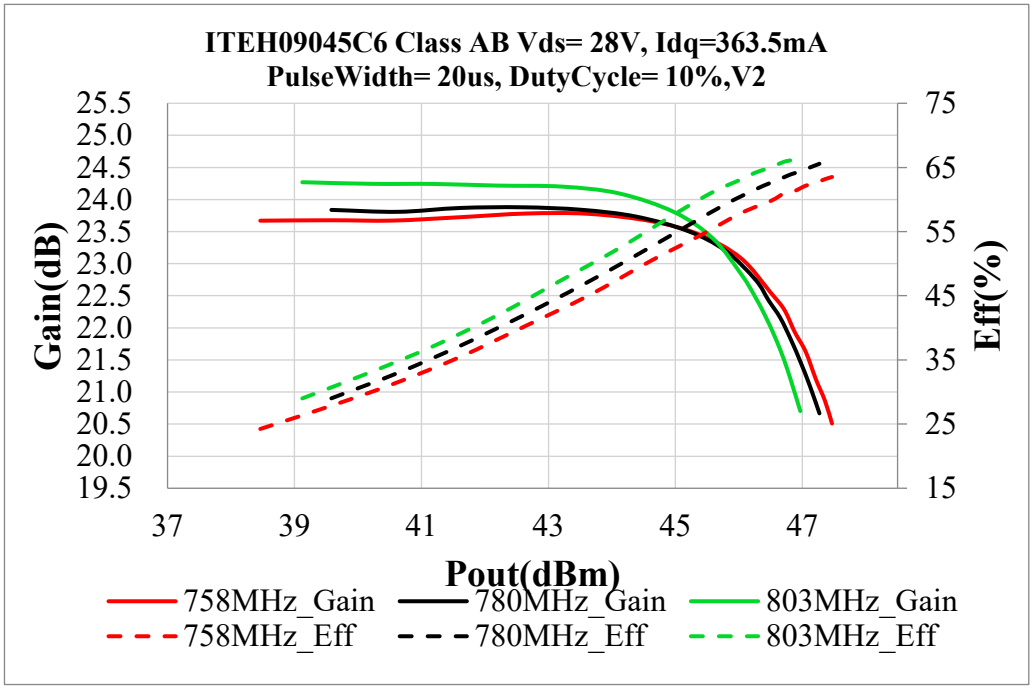


Figure 2. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

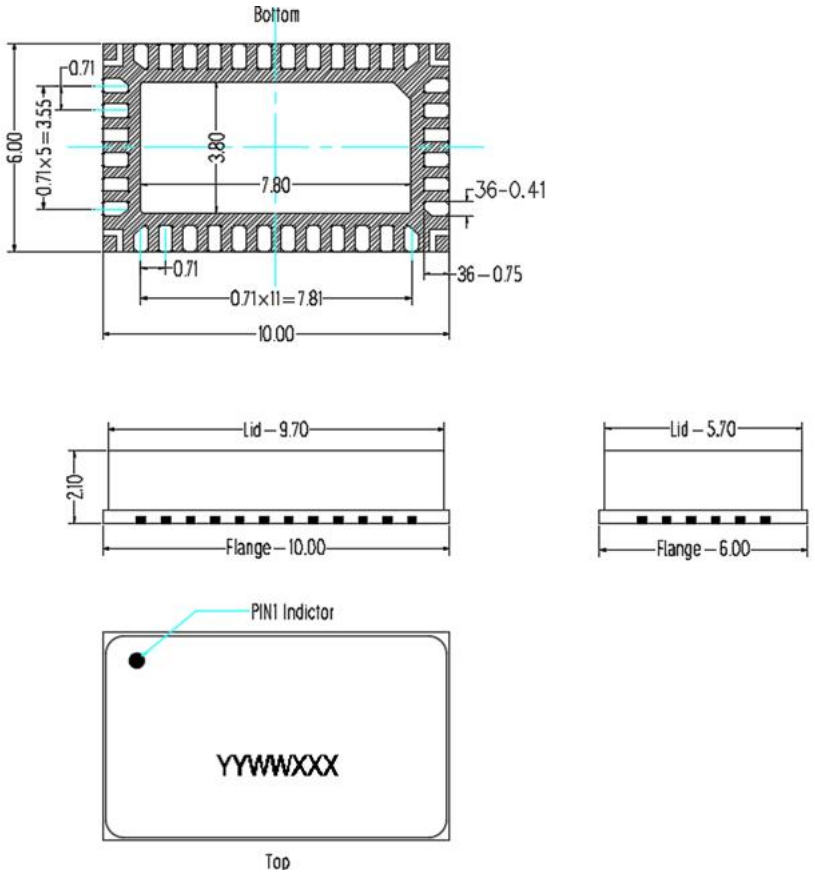
Component	Value	Quantity
U1	ITEH09045C6	1
C1	3.3pF	1
C2、C5、C6、C7	56pF	4
C3、C4	8.2pF	2
C8、C9、C10	10uF/63V	3
R1	50Ω	1
R2	10Ω	1
C11	470uF/63V	1

Figure3: Power gain and Efficiency as function of Pout



Package Dimensions

10*6 Plastic Package



Notes:

1. All dimensions are in mm;
2. The tolerances unless specified are ±0.2mm.

Revision history

Table 7. Document revision history

Date	Revision	Datasheet Status
2023/02/03	Rev 1.0	Preliminary Datasheet
2024/5/14	Rev 2.0	Die configuration changed and released

Application data based on ZYX-23-02/ZYX-24-40

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