



15W,28V Plastic RF LDMOS Transistor

ITEH09015C6

Description

The ITEH09015C6 is a 15-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 31-32dBm WCDMA or LTE ACLR without DPD needed purely by back off operation.

It can also support equivalent CW operation by surface mounted through vias



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

Freq (MHz)	Pout (dBm)	CCDF (dB)	ACPR (dBc)	Gain (dB)	Efficiency (%)
758	32.01	9.53	-46.6	19.0	22.3
780	32.00	9.58	-48.1	18.6	22.5
803	32.00	9.46	-47.0	19.0	22.7

- Typical 700-1000MHz broadband Class AB CW RF Performance (On Innegration fixture with device soldered).

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
700	41.63	14.6	55.4	17.16	42.87	19.4	61.0
750	41.94	15.7	56.3	17.81	43.1	20.4	61.7
800	42.06	16.1	57.1	18.17	43.09	20.4	61.8
850	41.94	15.6	59.2	18.98	43.01	20.0	63.4
900	41.83	15.3	60.6	19.22	42.83	19.2	64.6
950	41.55	14.3	61.5	19.29	42.58	18.1	65.0
1000	41.07	12.8	61.3	18.96	42.05	16.1	63.9

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_{DS}	+65	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+28	Vdc
Storage Temperature Range	T_{stg}	-65 to +150	°C
Case Operating Temperature	T_c	+150	°C



Operating Junction Temperature	T_J	+225	°C
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Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case $T_C = 85^\circ\text{C}$, DC test	$R_{\theta JC}$	6	°C/W

Table 3. ESD Protection Characteristics

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

Table 4. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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DC Characteristics

Drain-Source Voltage $V_{GS}=0$, $I_{DS}=100\mu\text{A}$	$V_{(BR)DSS}$		65		V
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 28\text{V}$, $V_{GS} = 0\text{V}$)	I_{DSS}	—	—	1	μA
Gate--Source Leakage Current ($V_{GS} = 11\text{V}$, $V_{DS} = 0\text{V}$)	I_{GSS}	—	—	1	μA
Gate Threshold Voltage ($V_{DS} = 28\text{V}$, $I_D = 600\mu\text{A}$)	$V_{GS(th)}$	—	2	—	V
Gate Quiescent Voltage ($V_{DD} = 28\text{V}$, $I_D = 110\text{mA}$, Measured in Functional Test)	$V_{GS(Q)}$	—	2.6	—	V

Load Mismatch (In Innogrations Test Fixture, 50 ohm system): $V_{DD} = 28\text{Vdc}$, $I_{DQ} = 110\text{mA}$, $f = 800\text{MHz}$

VSWR 10:1 at 15W pulse CW Output Power	No Device Degradation
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Figure 1: Pin Definition (Top View)

Pin No.	Symbol	Description
8,9,10,11	Vgs/RF In	Vgs and RF input
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

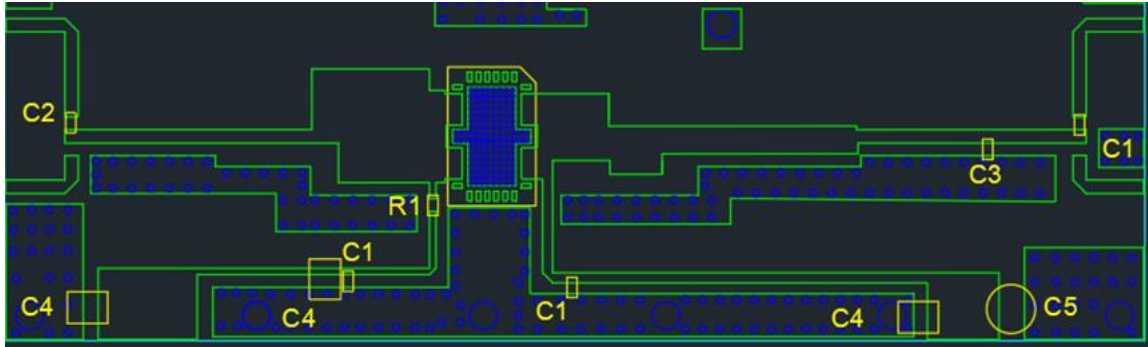


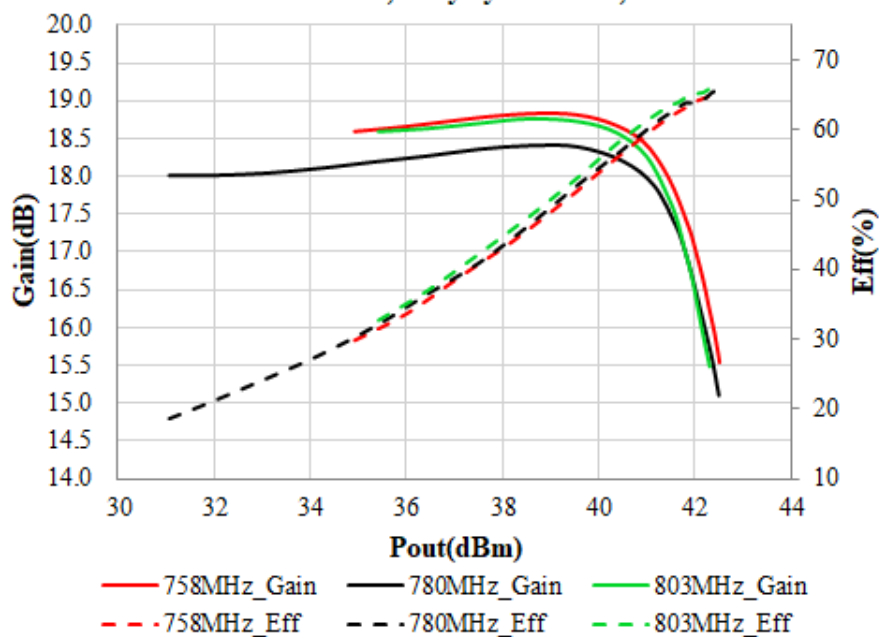
Figure 2. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

Component	Value	Quantity
U1	ITEH09015C6	1
C1	68pF	3
C4	10uF/63V	3
R1	10 Ω	1
C5	470uF/63V	1
C2	6.8pF	1
C3	2.7pF	1

TYPICAL CHARACTERISTICS

STAV Class AB $V_{ds}=28V$, $I_{dq}=84.4mA$
PulseWidth= 20us, DutyCycle= 10%, DEMO1



700-1000MHz application board

Reference Circuit of Test Fixture Assembly Diagram 20mils RO4350B

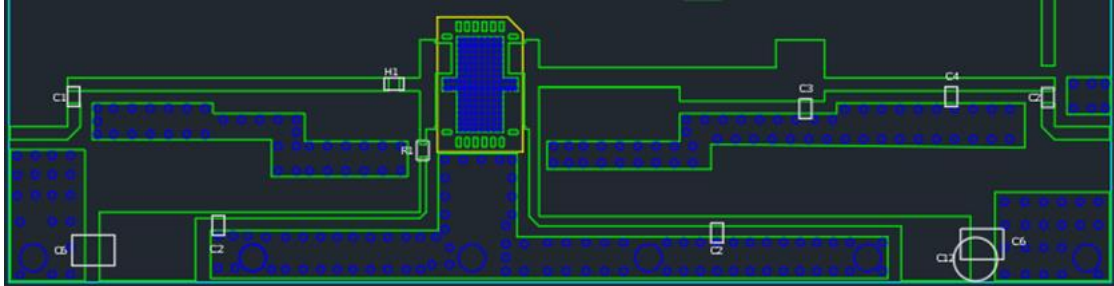
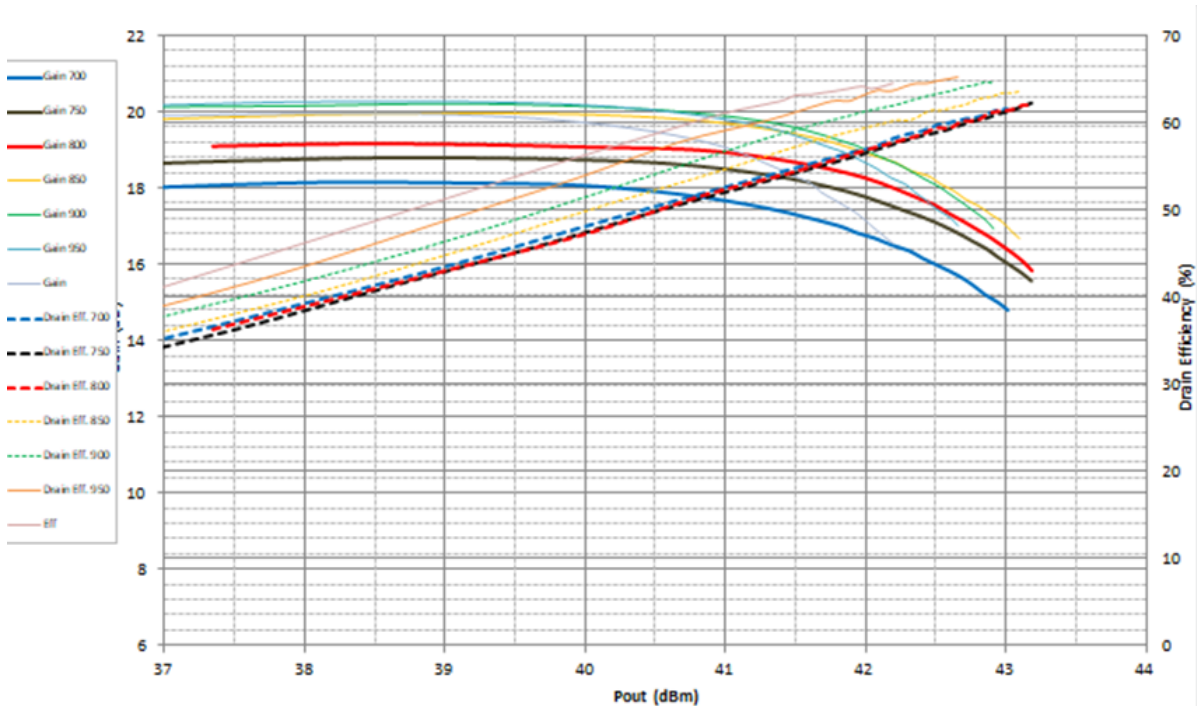


Figure 2. Test Circuit Component Layout

Table 6. Test Circuit Component Designations and Values

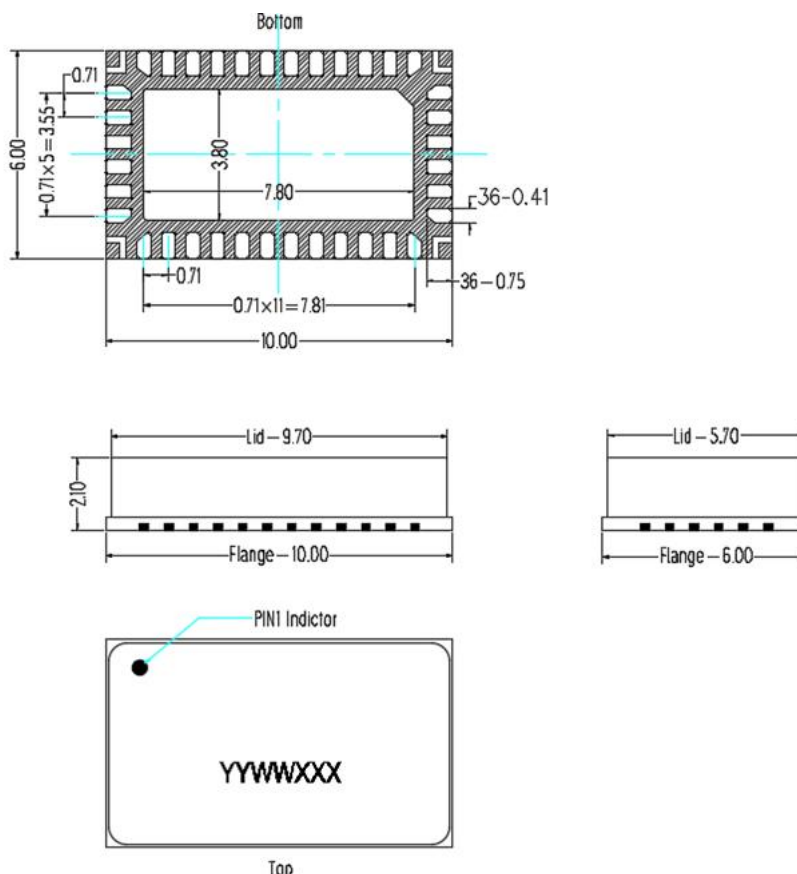
Component	Value	Quantity
C1	3.3pF	1
H1	2.2nH	1
R1	10 ohm	1
C6	10uF	2
C3	1.8 pF	1
C2	100pF	3
C4	1.1 pF	1
C12	470uF	1

TYPICAL CHARACTERISTICS



Package Dimensions

10*6 Plastic Package



Notes:

1. All dimensions are in mm;
2. The tolerances unless specified are $\pm 0.2\text{mm}$.

Revision history

Table 7. Document revision history

Date	Revision	Datasheet Status
2023/8/2	Rev 1.0	Preliminary Datasheet
2024/11/21	Rev 1.1	Add 700-1000MHz application data

Application data based on ZXY-23-06/24-35

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