



45W,28V Plastic RF LDMOS Transistor

ITGV10090C6

Description

The ITGV10090C6 is a 45-watt, highly rugged, LDMOS transistor, designed for any general applications at frequencies from HF to 0.7GHz, in 10*6mm QFN plastic package, supporting surface mounted on PCB through high density grounding vias. It can support CW, pulsed CW and any modulation signal at saturated or linear conditions.



- Typical 370-430MHz Class AB RF Performance (On Innegration fixture with device soldered).
V_{ds}=28V, I_{dq}=300mA, V_{gs}=3.43V

FREQ (MHZ)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
370	45.88	38.7	59.6	21.28	47.04	50.5	66.8
400	46.02	40.0	62.5	21.17	47.11	51.4	69.5
430	45.91	39.0	66.9	22.85	46.82	48.1	73.1

- Typical 147-183MHz Class AB RF Performance (On Innegration fixture with device soldered).
V_{ds}=28V, I_{dq}=300mA, V_{gs}=3.43V

FREQ (MHZ)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
147	45.14	32.7	67.3	26.97	45.78	37.8	71.5
164	45.17	32.9	72.1	27.08	45.89	38.8	77.5
183	44.48	28.0	75.9	27.27	45.22	33.2	81.5

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
- HF/VHF/UHF Power amplifier

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	+110	Vdc
Gate--Source Voltage	V _{GS}	-10 to +10	Vdc
Operating Voltage	V _{DD}	+36	Vdc
Storage Temperature Range	T _{stg}	-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
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Thermal Resistance, Junction to Case $T_C = 85^\circ\text{C}$, DC test	$R_{\theta JC}$	2	$^\circ\text{C/W}$
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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 $V_{GS}=0$, $I_{DS}=100\mu\text{A}$	$V_{(BR)DSS}$		110		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 ($V_{DD} = 28\text{V}$, $I_D = 300\text{mA}$, Measured in Functional Test)	$V_{GS(Q)}$	—	3.4	—	V

Load Mismatch (In Innegration Test Fixture, 50 ohm system): $V_{DD} = 28\text{Vdc}$, $I_{DQ} = 300\text{mA}$, $f = 700\text{MHz}$

VSWR 10:1 at 45W pulse CW Output Power	No Device Degradation
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Figure 1: Pin Definition(Top View)



Pin No.	Symbol	Description
8,9,10,11,14,15,16,17	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.

370-430MHz application board

Reference Circuit of Test Fixture Assembly Diagram 20mils RO4350B

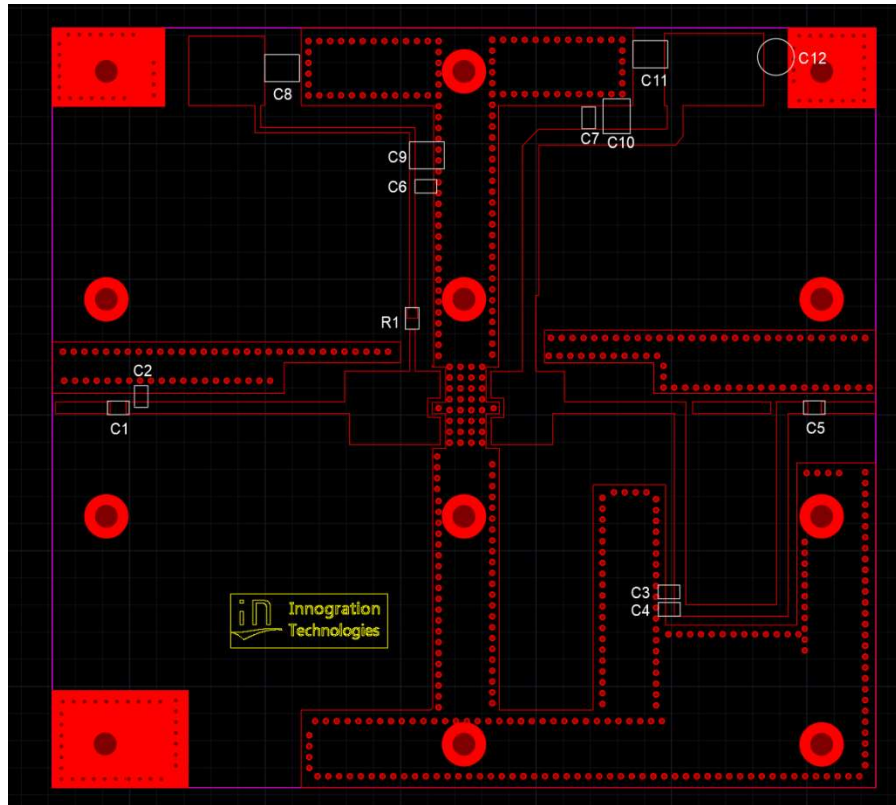


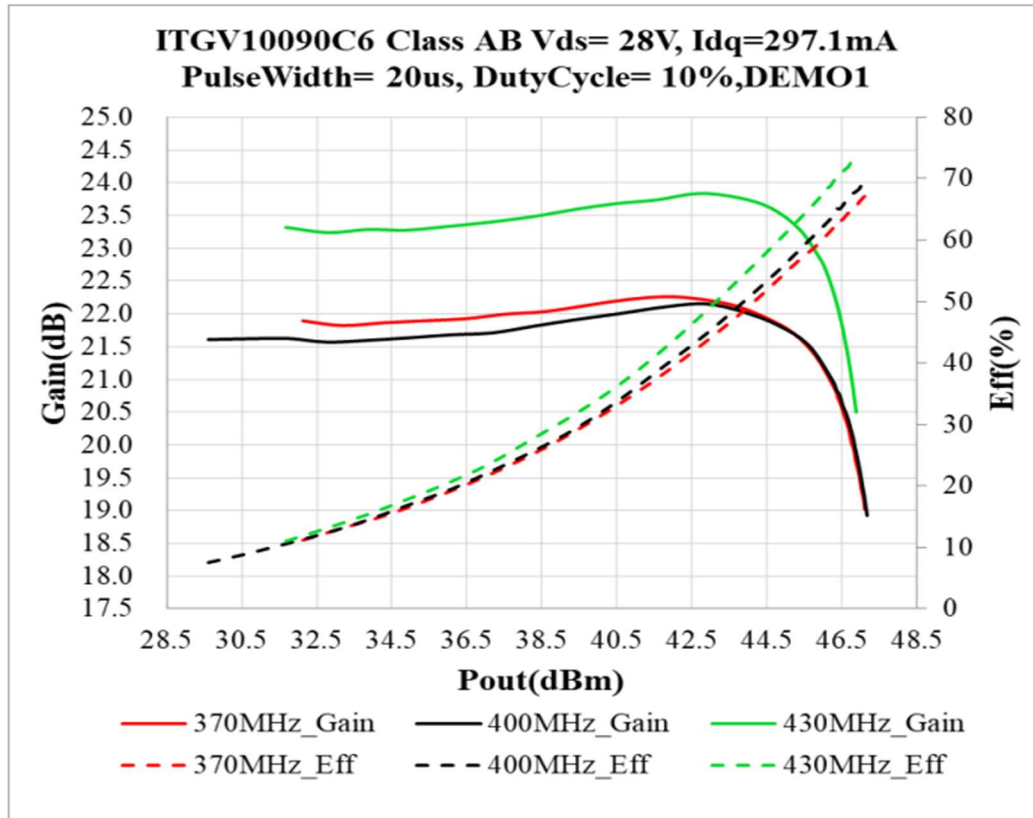
Figure 2. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

Component	Value	Quantity
U1	ITGV10090C6	1
C1 、 C5、 C6、 C7	33pF	4
C2	15pF	1
C3	9.2pF	1
C4	6.8pF	1
C8、 C9、 C10、 C11	10uF/63V	4
R1	10 Ω	1
C12	470uF/63V	1

TYPICAL CHARACTERISTICS

Figure 3. Power Gain and Drain Efficiency as function of Power Output



147-183MHz application board

Reference Circuit of Test Fixture Assembly Diagram 20mils RO4350B

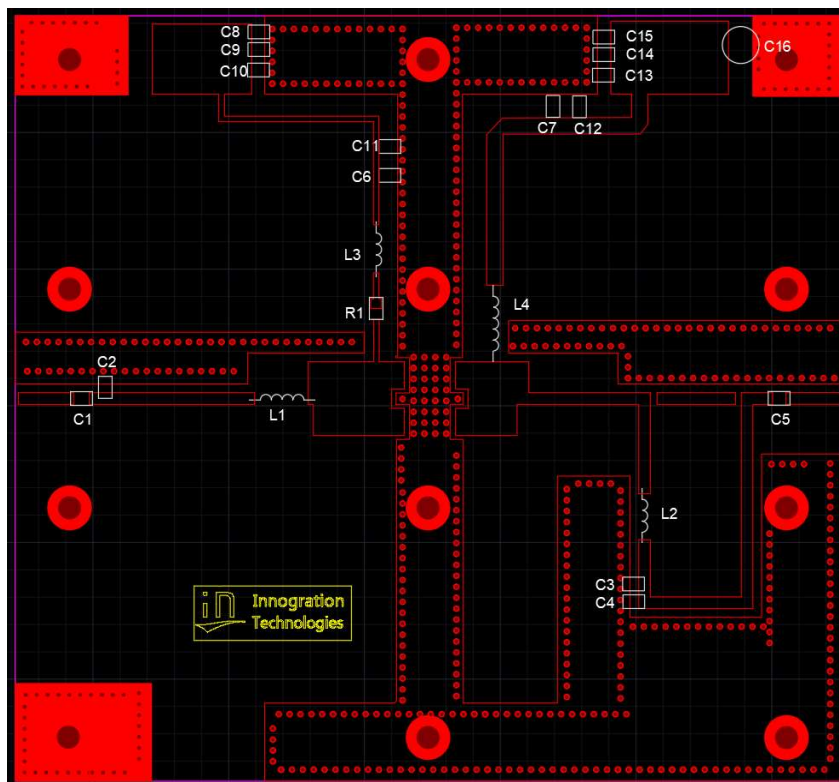


Figure 4. Test Circuit Component Layout

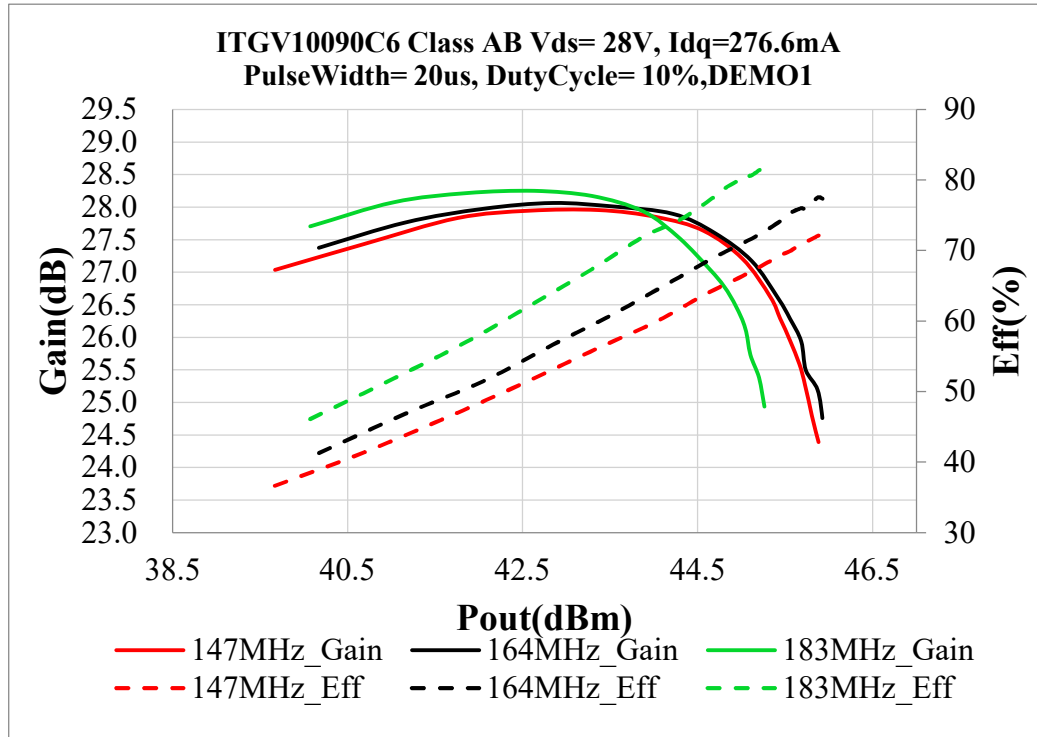
Table 6. Test Circuit Component Designations and Values

Component	Value	Quantity
U1	ITGV10090C6	1
C1、C5、C6、C7	100pF	4
C2	12pF	1
C3	15pF	1
C4	8.2pF	1
C8、C15	10uF	2
C9、C14	10nF	2
C10、C11、C12、C13	1nF	4
C16	470uF/63V	1
R1	10 Ω	1
L1	d=1mm,D=3mm, 4 Turns	1
L2、L3	d=1mm,D=3mm, 3 turns	2
L4	d=1mm, D=3mm, 5 turns	1



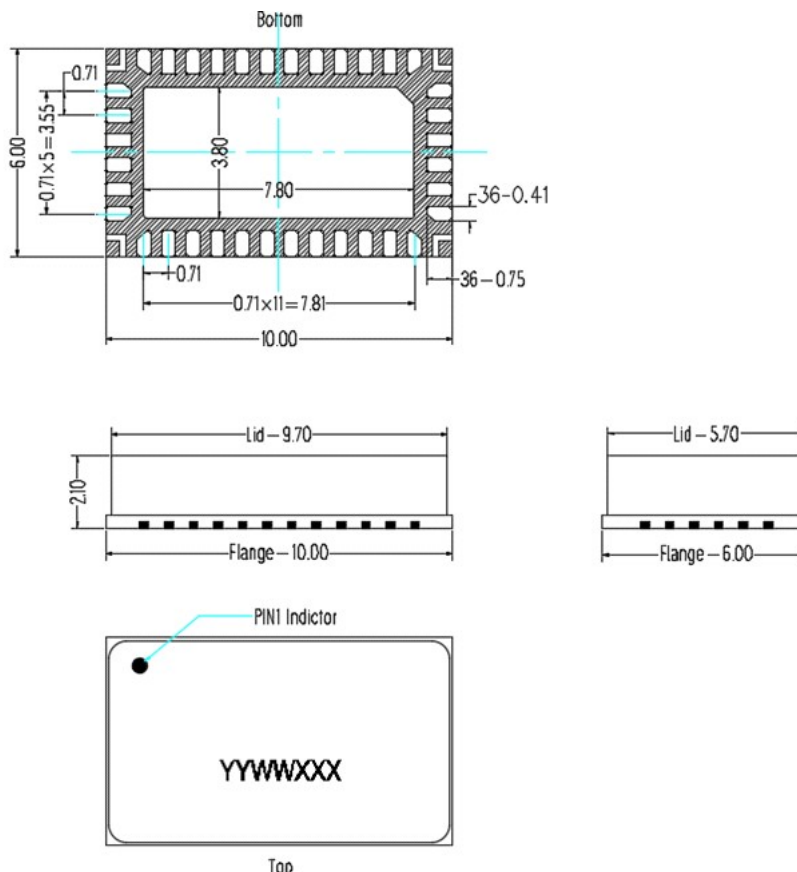
TYPICAL CHARACTERISTICS

Figure 3. Power Gain and Drain Efficiency as function of Power Output



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
2023/09/04	Rev 1.0	Preliminary Datasheet
2024/6/3	Rev 1.1	Add 150MHz data

Application data based on ZYX-23-09/24-42

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