



30W,28V Plastic RF LDMOS Transistor

ITEH16030C6

Description

The ITEH16030C6 is a 30-watt, highly rugged, unmatched LDMOS transistor, designed for any general applications at frequencies within up to 1.6GHz, in 10*6mm QFN plastic package, supporting surface mounted on PCB through high density grounding vias.

• Typical L band Class AB CW RF Performance (On Innegration fixture with device soldered).

VDS=28V, Idq=180mA

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
1080	44.12	25.8	57.6	17.61	45.14	32.7	62.8
1150	44.26	26.7	54.8	17.77	45.39	34.6	59.9
1200	44.39	27.5	54.1	18.02	45.47	35.2	59.1
1250	44.41	27.6	54.3	17.48	45.47	35.3	59.1
1300	44.29	26.8	54.7	17.75	45.33	34.1	59.5
1340	44.05	25.4	55.6	17.13	45.07	32.2	60.1

• Typical P band Class AB CW RF Performance (On Innegration fixture with device soldered)

VDS=28V, Idq=180mA

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
650	44.07	25.5	62.6	21.95	44.98	31.5	68.2
700	44.21	26.4	61.8	21.81	45.26	33.6	68.0
750	44.08	25.6	60.6	22.17	45.28	33.7	67.9
800	44.08	25.6	62.0	22.29	45.15	32.8	68.2
850	43.7	23.5	63.2	21.41	44.86	30.6	69.9

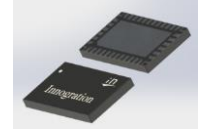
• Typical broadband Class AB CW RF Performance (On Innegration fixture with device soldered)

VDS=28V, Idq=100mA

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
700	44	25.1	51.1	16.62	45.28	33.8	56.5
750	44.14	25.9	52.7	17.48	45.47	35.2	58.6
800	44.2	26.3	55.8	18	45.36	34.4	60.6
850	44.04	25.3	58.7	18.46	45.09	32.3	62.5
900	43.54	22.6	59.9	18.41	44.66	29.3	63.5
950	42.91	19.6	59.0	17.61	43.99	25.1	61.6
1000	42.26	16.8	57.9	16.66	43.16	20.7	60.2

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

- Broadcast and Industrial, Scientific and Medical applications in the frequency range from up to 1.6GHz
- P band and L band power amplifier

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

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case $T_C = 85^\circ\text{C}$, $T_J = 200^\circ\text{C}$, DC test	$R_{\theta JC}$	0.8	°C/W

Table 3. ESD Protection Characteristics

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

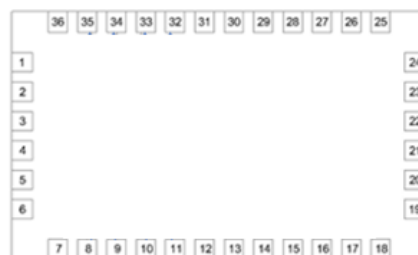
Table 4. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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 ($V_{DD} = 28\text{V}$, $I_D = 180\text{mA}$, Measured in Functional Test)	$V_{GS(Q)}$	—	2.7	—	V

Load Mismatch (In Innegration Test Fixture, 50 ohm system): $V_{DD} = 28\text{Vdc}$, $I_{DQ} = 18\text{mA}$, $f = 1600\text{MHz}$

VSWR 10:1 at 30W 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.

1080-1340MHz

Reference Circuit of Test Fixture Assembly Diagram

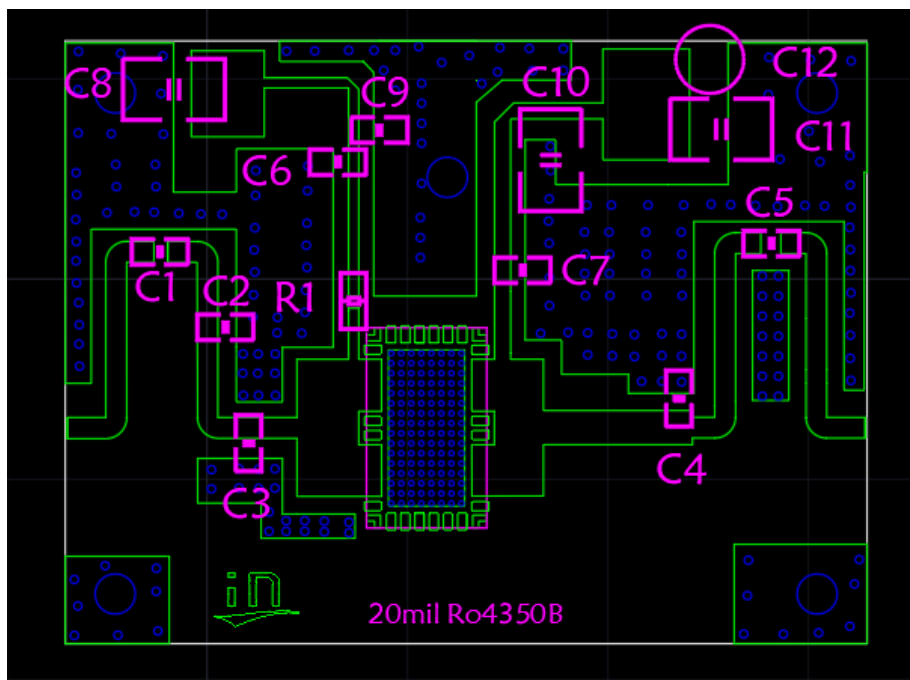


Figure 2. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

Component	Value	Quantity
U1	ITEH16030C6	1
C1	8.2pF	1
C5、C6、C7	20pF	3
C2	2.7pF	1
C3	3.3pF	1
C4	5.6pF	1
C8、C10、C11	10uF/63V	3
C9	10uF/16V	1
R1	10 Ω	1
C12	470uF/63V	1



TYPICAL CHARACTERISTICS

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

ITEH16030C6 Class AB $V_{ds}=28V$, $I_{dq}=198.5mA$
PulseWidth= 20us, DutyCycle= 10%, DEMO1

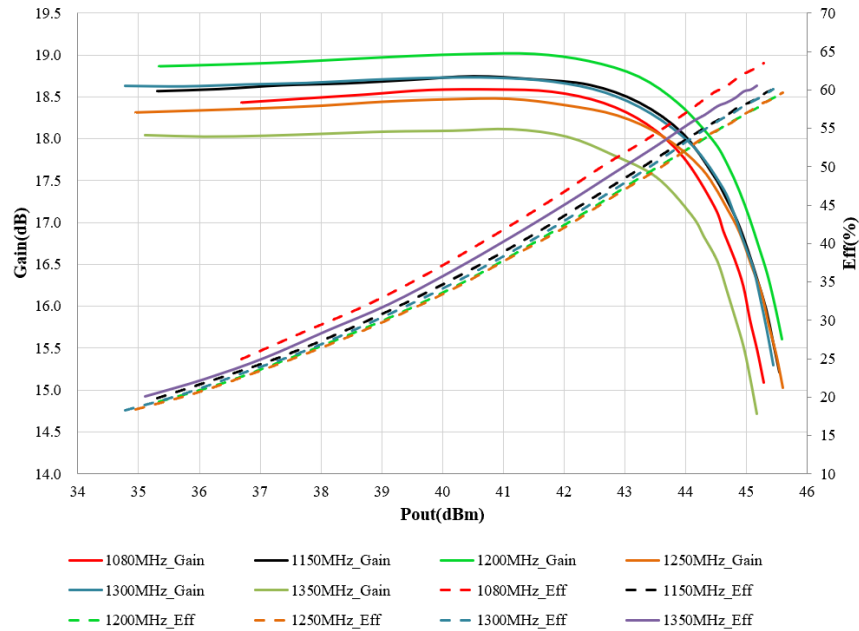
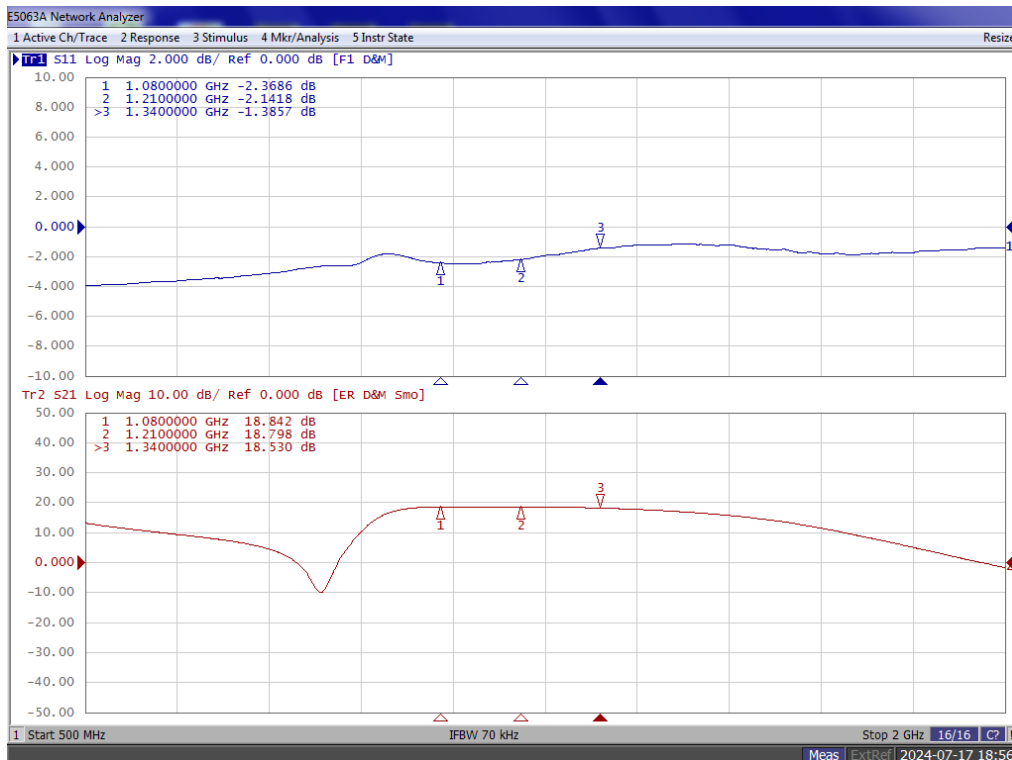


Figure 4. Network analyzer output S11/S21



650-850MHz

Reference Circuit of Test Fixture Assembly Diagram

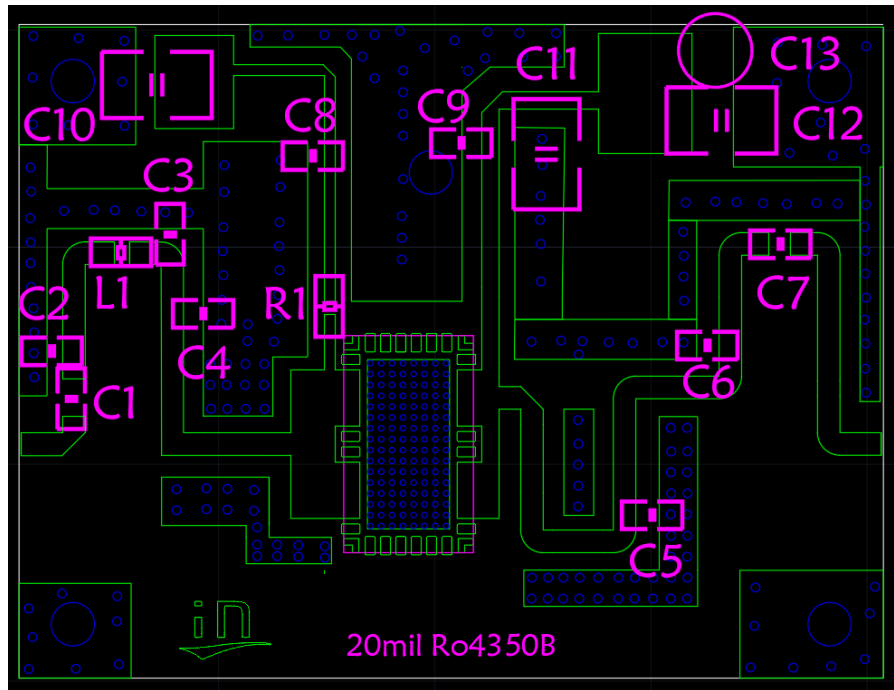


Figure 5. Test Circuit Component Layout

Table 6. Test Circuit Component Designations and Values

Component	Value	Quantity
U1	ITEH16030C6	1
C1	10pF	1
L1	4.7nH	1
C7、C8、C9	68pF	3
C2	1.5pF	1
C3、C6	2pF	2
C4	6.8pF	1
C5	5.6pF	1
C10、C11、C12	10uF/63V	3
R1	10 Ω	1
C13	470uF/63V	1

TYPICAL CHARACTERISTICS

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

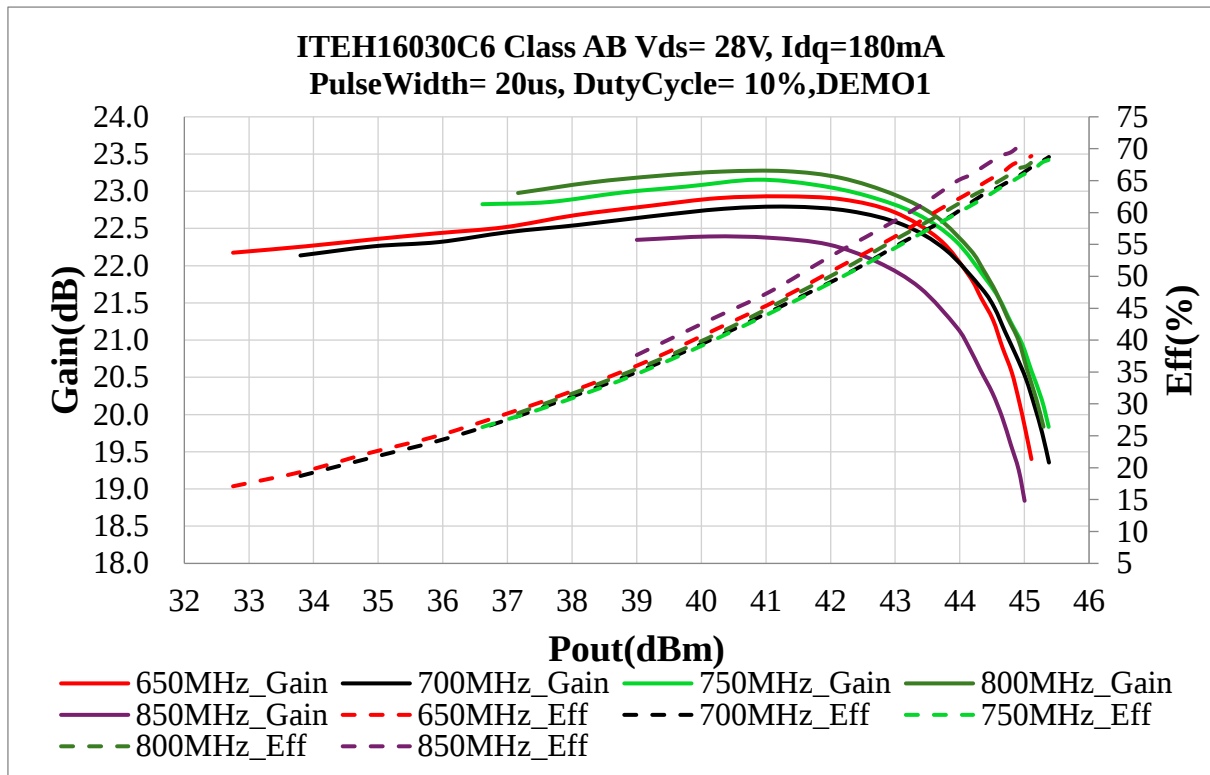
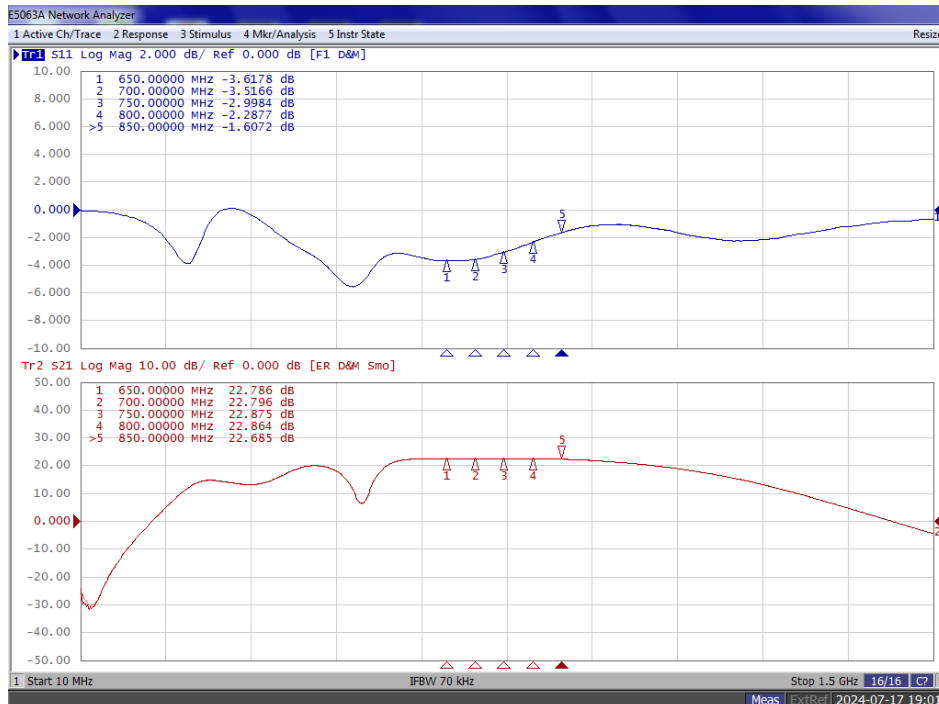


Figure 4. Network analyzer output S11/S21



700-1000MHz

Reference Circuit of Test Fixture Assembly Diagram

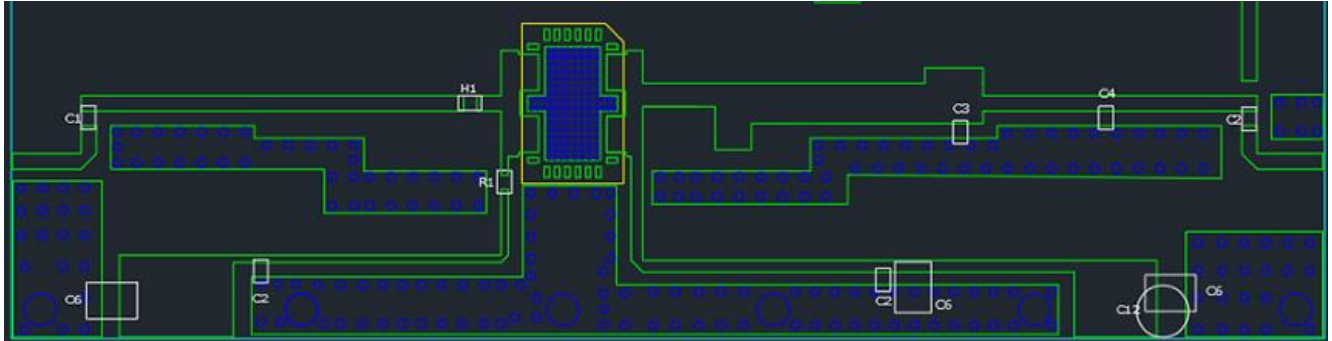


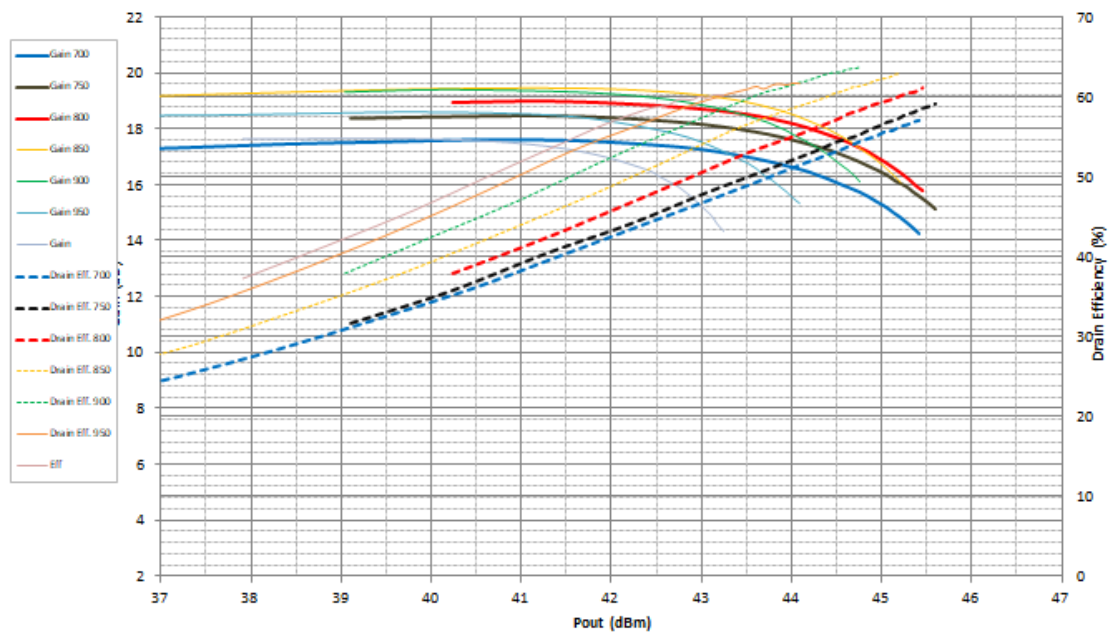
Figure 5. Test Circuit Component Layout

Table 7. Test Circuit Component Designations and Values

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

TYPICAL CHARACTERISTICS

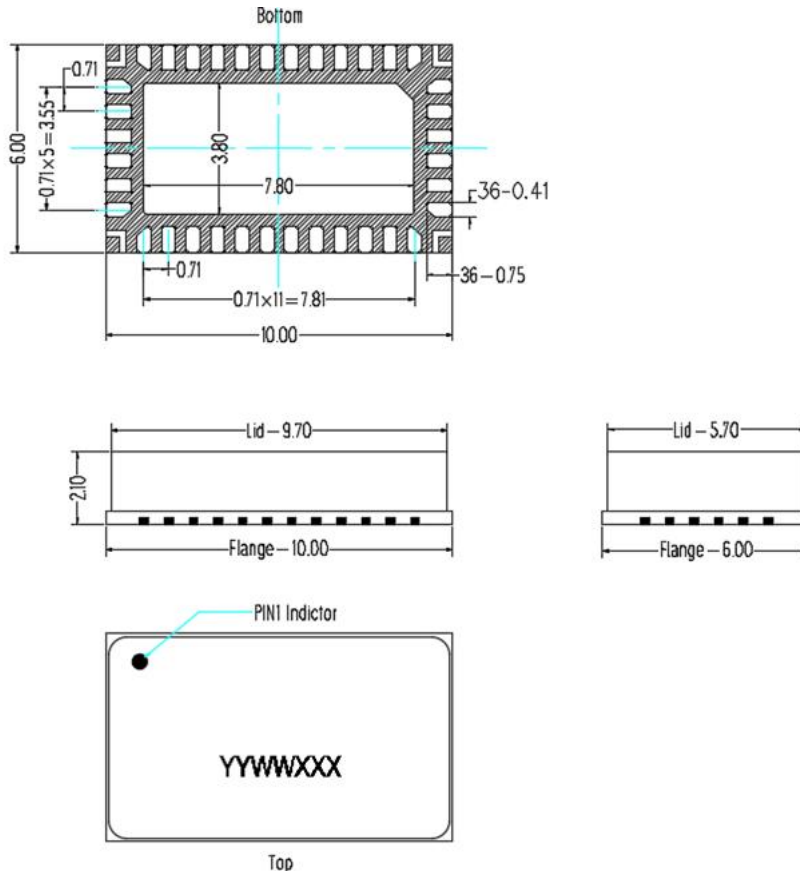
Figure 5. Power Gain and Drain Efficiency as function of Power Out





Package Dimensions

10*6 Plastic Package



Notes:

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

Revision history

Table 7. Document revision history

Date	Revision	Datasheet Status
2024/7/19	Rev 1.0	Preliminary Datasheet
2024/11/21	Rev 1.1	Add 700-1000MHz application data

Application data based on ZYX-24-48/49, ZXY-24-36

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