2SK410

Silicon N-Channel MOS FET

HITACHI

Application

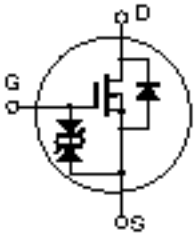
HF/VHF power amplifier

Features

- High breakdown voltage
- You can decrease handling current.
- Included gate protection diode
- No secondary–breakdown
- Wide area of safe operation
- Simple bias circuitry
- No thermal runaway

Outline

RFPAK-A



1. Source
2. Source
3. Source
4. Source
5. Drain
6. Gate

Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	180	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	8	A
Channel dissipation	Pch*[1]	120	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Note: 1. Value at T_C = 25°C

Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Power output	P_O	140	180	—	W	V_{DD} = 80 V, f = 28 MHz,
Drain efficiency	η	—	80	—	%	I_{DQ} = 0.1 A, Pin = 5 W
Drain to source breakdown voltage	$V_{(BR)DSS}$	180	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	0.5	—	3.0	V	I_D = 1 mA, V_{DS} = 10 V*[1]
Drain current	I_{DSS}	—	—	1.0	mA	V_{DS} = 140 V, V_{GS} = 0
Drain to source saturation voltage	$V_{DS(on)}$	—	3.8	6.0	V	I_D = 4 A, V_{GS} = 10 V*[1]
Forward transfer admittance	$\|y_{fs}\|$	0.9	1.25	—	S	I_D = 3 A, V_{DS} = 20 V*[1]
Input capacitance	Ciss	—	440	—	pF	V_{GS} = 5 V, V_{DS} = 0, f = 1 MHz
Output capacitance	Coss	—	75	—	pF	V_{GS} = –5 V, V_{DS} = 50 V, f = 1 MHz
Reverse transfer capacitance	Crss	—	0.5	—	pF	V_{GD} = –50 V, f = 1 MHz
Power output	P_O	—	100	—	W_{PEP}	V_{DD} = 80 V, f = 28 MHz,
Power gain	PG	—	17	—	dB	Δf = 20 kHz, IMD ≤ –30 dB

Note: 1. Pulse Test

CAUTION: OPERATING HAZARDS
Beryllium Oxide Ceramics have been employed in these products.
Since dust or fume of the material is highly poison to the human body, please do not treat them mechanically or chemically in the manner which might expose them to the air. And it should never be thrown out with general industrial or domestic waste.

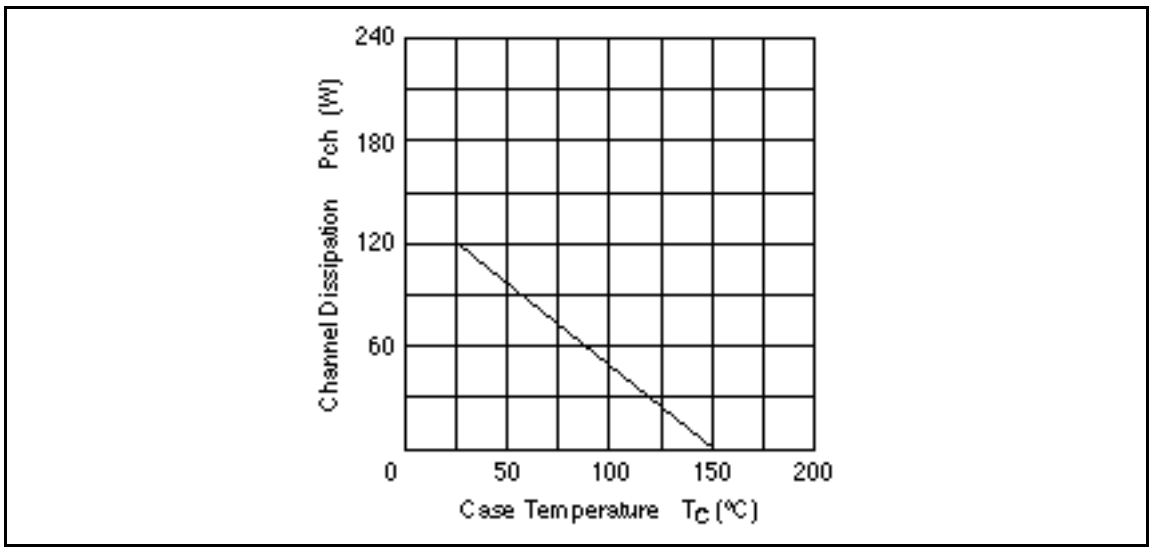


Figure 1 Power vs. Temperature Derating

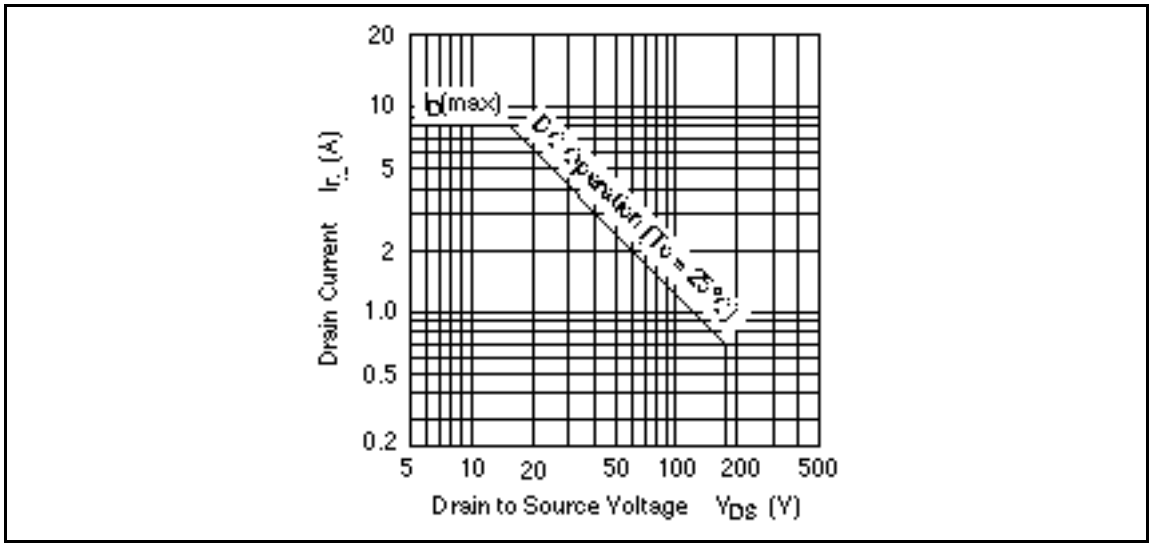


Figure 2 Maximum Safe Operation Area

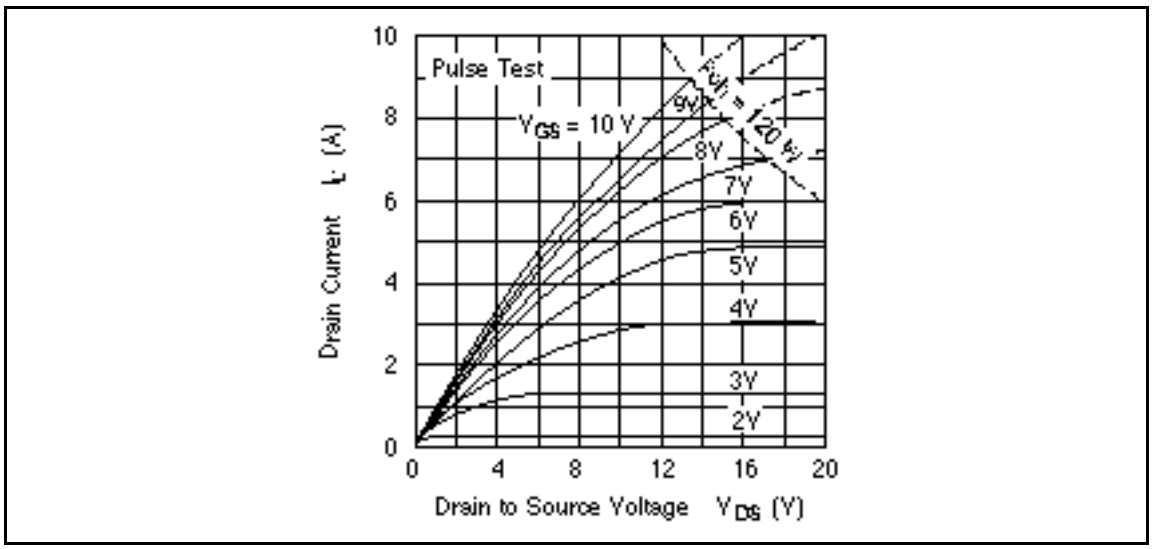


Figure 3 Typical Output Characteristics

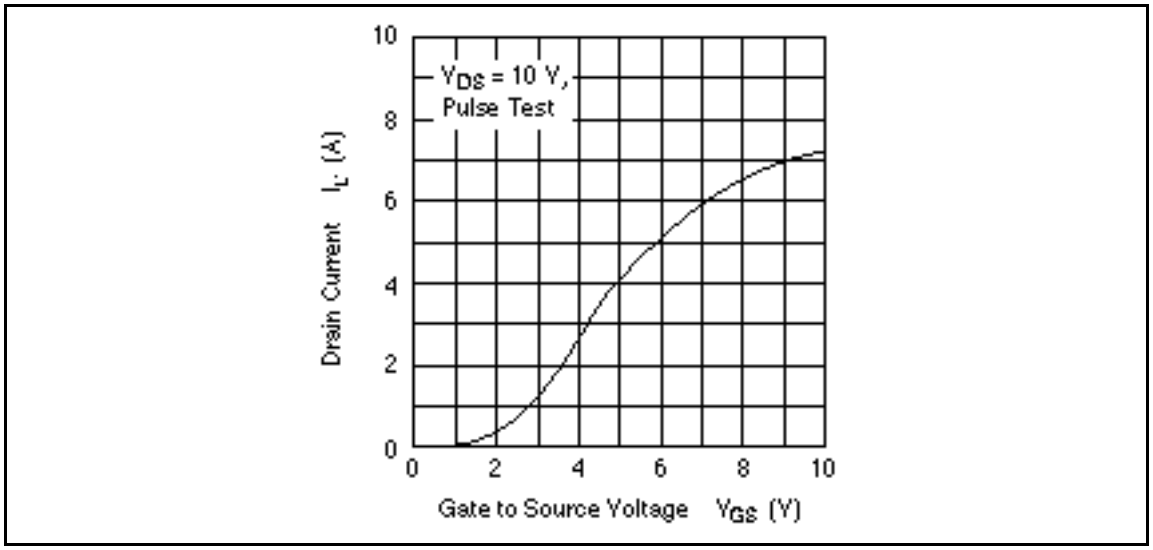


Figure 4 Typical Transfer Characteristics

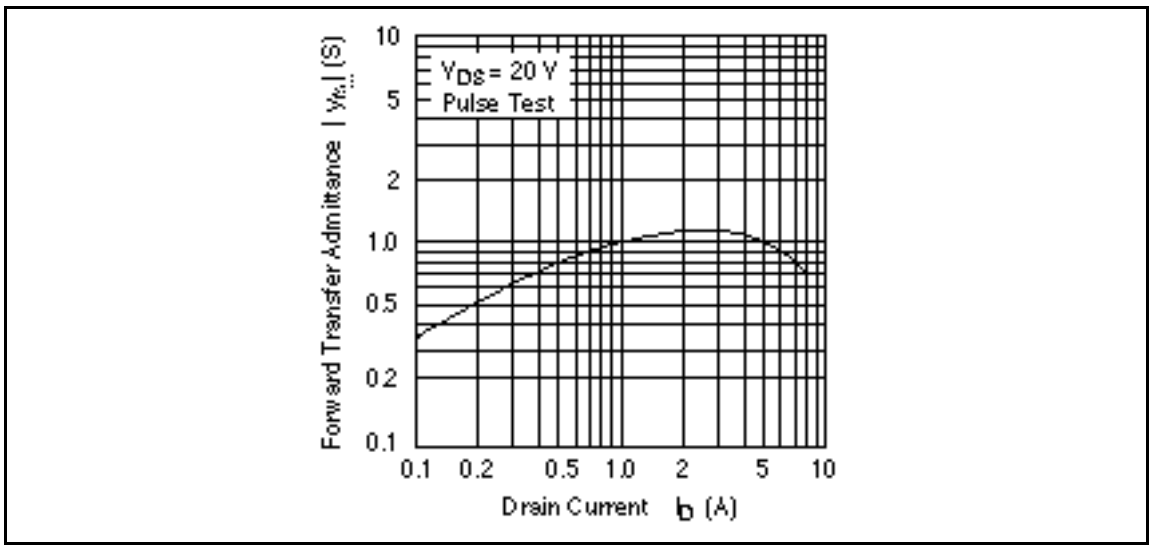


Figure 5 Forward Transfer Admittance vs. Drain Current

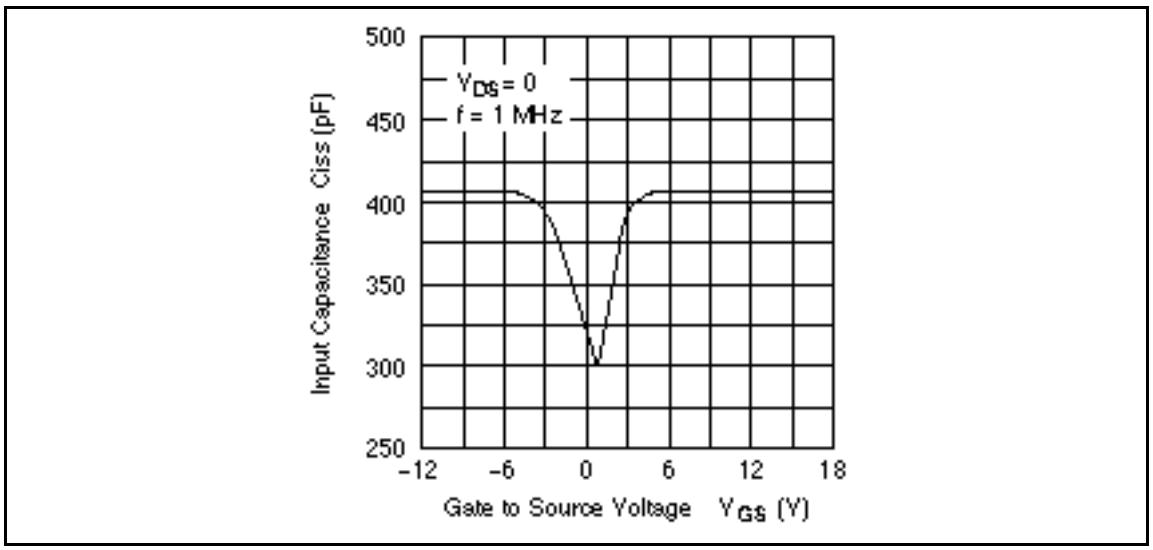


Figure 6 Input Capacitance vs. Gate to Source Voltage

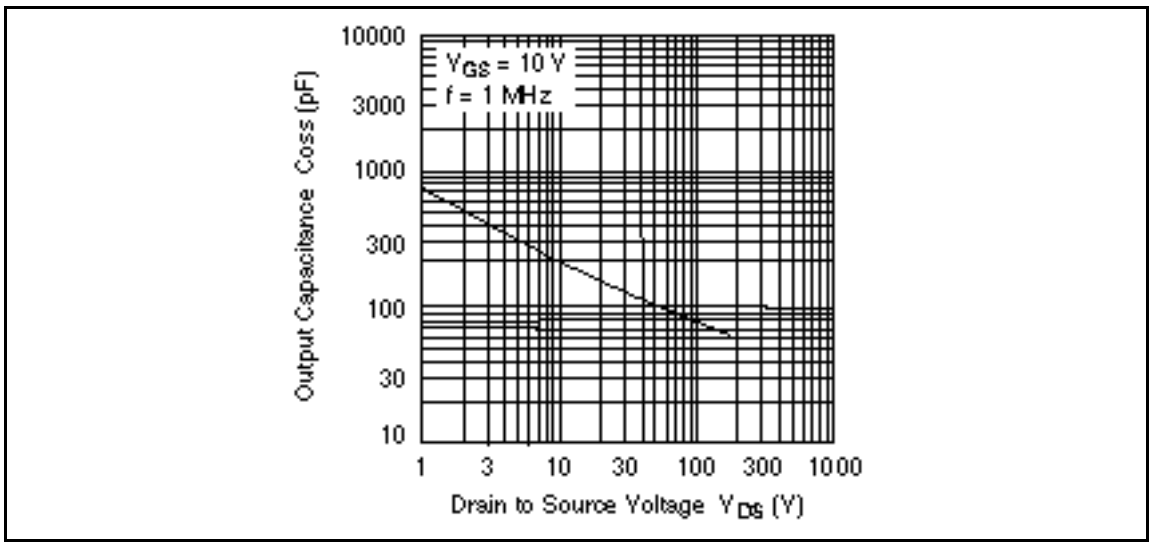


Figure 7 Output Capacitance vs. Drain to Source Voltage

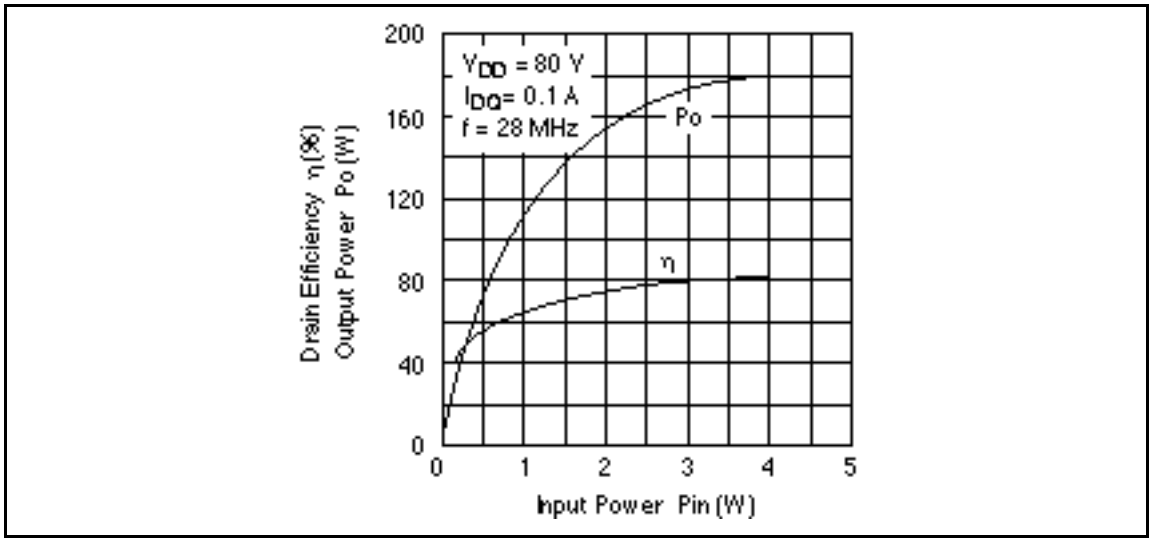


Figure 8 Output Power, Drain Efficiency vs. Input Power

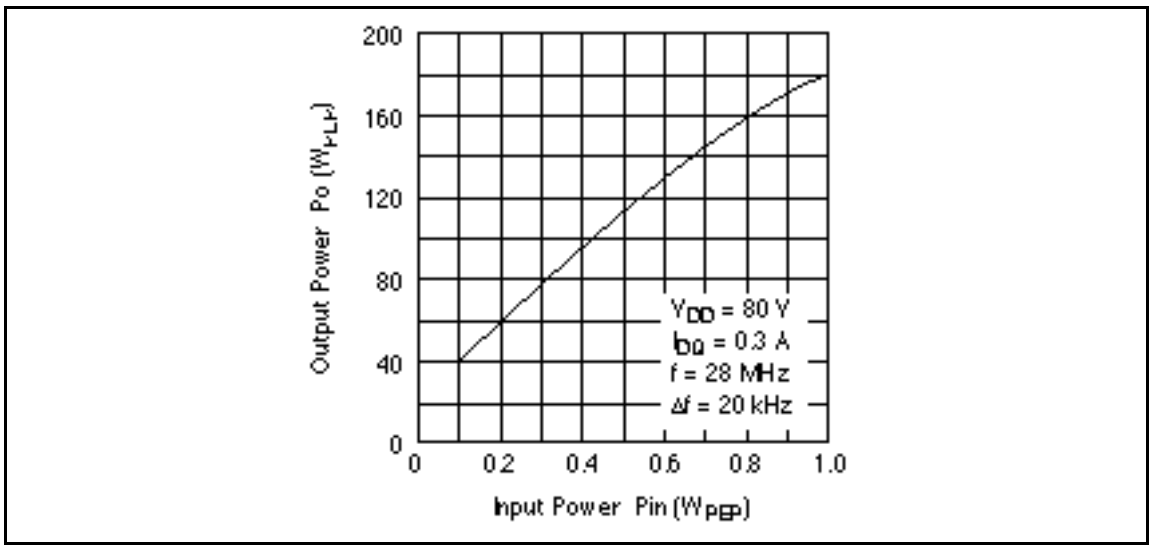


Figure 9 Output Power vs. Input Power (2 Tones)

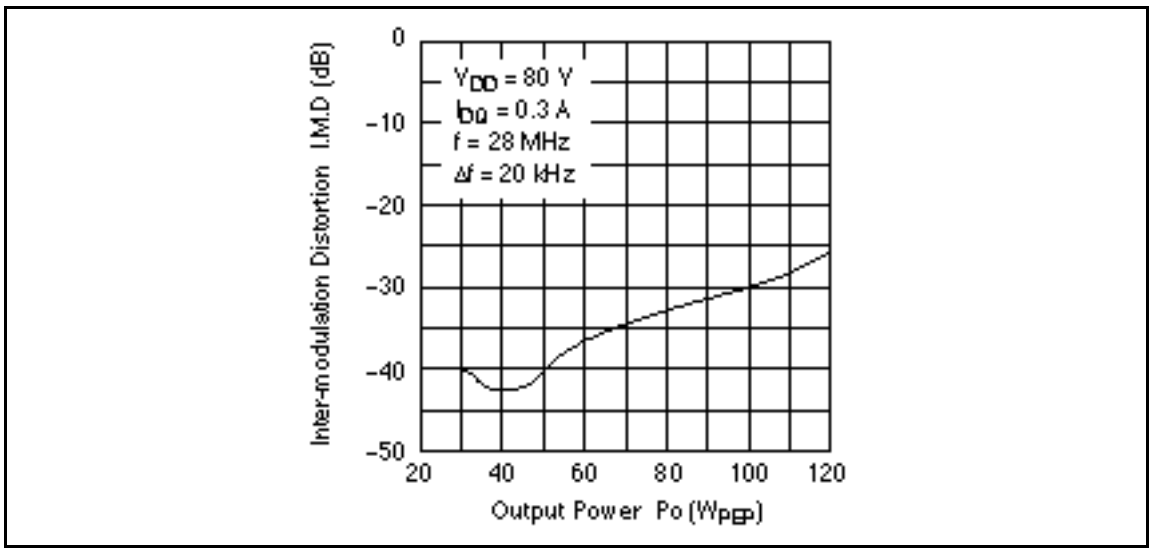
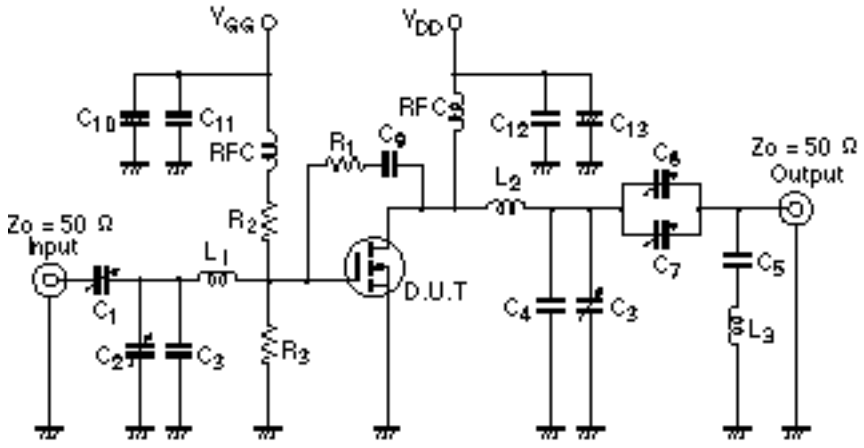


Figure 10 Inter-Modulation Distortion vs. Output Power

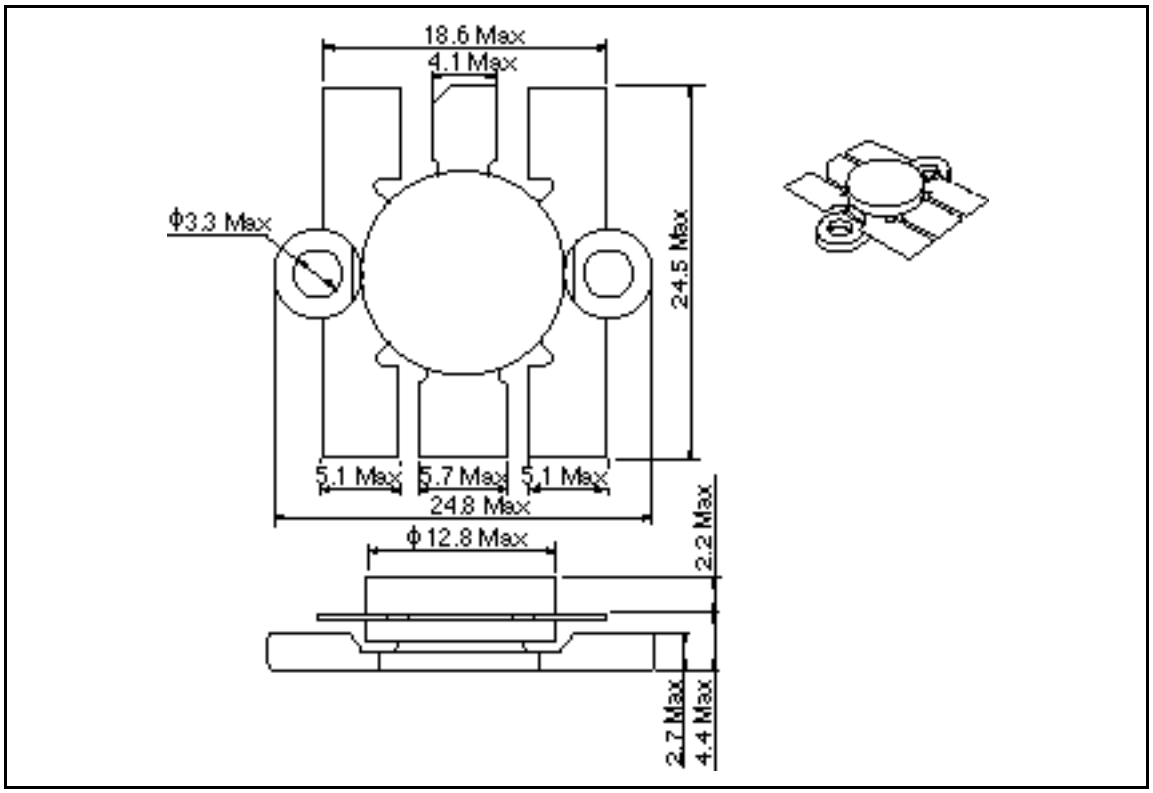


C_1, C_4 = to 50 pF	L_1: ID = 12 mm, d = 1.5 mm, T = 7 T
C_2, C_5 = to 20 pF	L_2: ID = 12 mm, d = 1.5 mm, T = 5 T
C_3, C_8 = 10 pF	L_3: ID = 12 mm, d = 1.5 mm, T = 5 T
C_7 = 32 pF	R_1 = 1 kΩ
C_8 = 15 pF	R_2, R_3 = 100 Ω
C_9, C_{11}, C_{12} = 0.1 μF	RFC$_1$ = FC 15 φ, d = 1 mm, T = 3 T
C_{10} = 4.7 μF	RFC$_2$ = FC 6 φ, d = 1 mm, T = 4 T
C_{13} = 22 μF	

Figure 11 28 MHz Pout Test Circuit

Package Dimensions

Unit: mm



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