2SK408,2SK409

HITACHI/{OPTOELECTRONIC

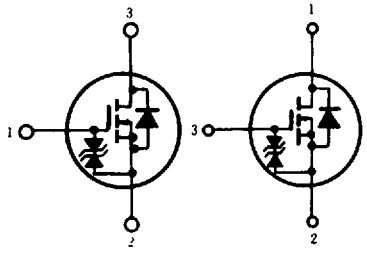
SILICON N-CHANNEL MOS FET

HF/VHF POWER AMPLIFIER

■ FEATURES

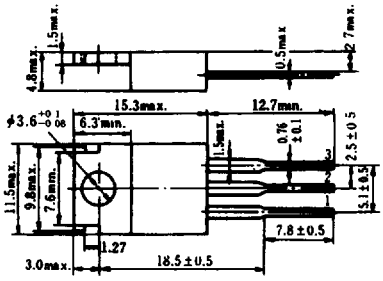
- High Breakdown Voltage.
- You Can Decrease Handling Current.
- Included Gate Protection Diode.
- No Secondary-Breakdown.
- Wide A.S.O. (Area of Safe Operation)
- Simple Bias Circuitry
- No Thermal Runaway.

2SK408 2SK409



2SK408
1 Gate
2 Source
3. Drain

2SK409
1. Drain
2 Source
3. Gate



(Dimensions in mm)

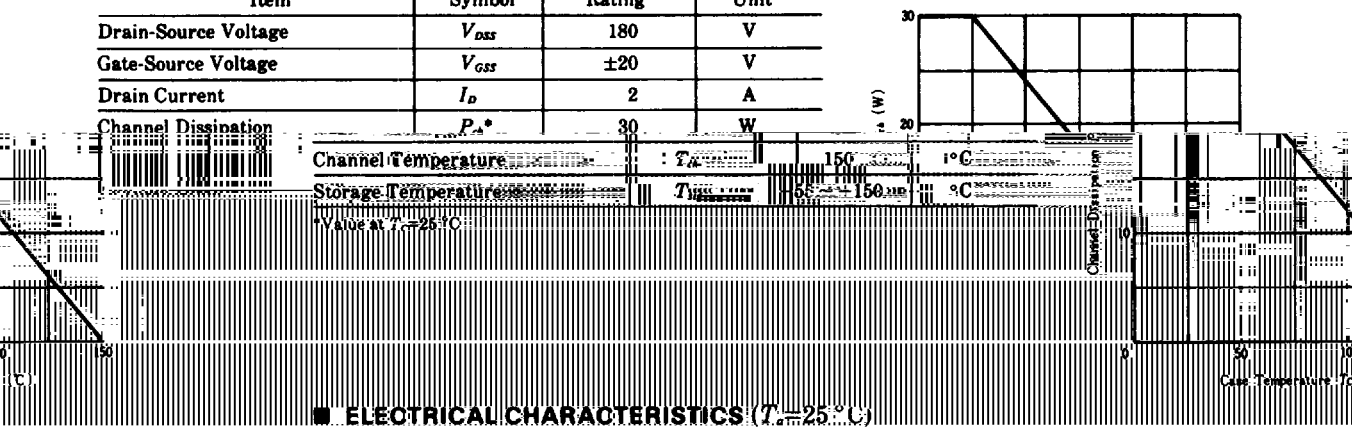
(JEDEC TO-220AB)

■ ABSOLUTE MAXIMUM RATINGS (T_a=25 °C)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	180	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current	I_D	2	A
Channel Dissipation	P_{ch}*	30	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	−55 ~ +150	°C

*Value at T_c=25 °C

POWER VS. TEMPERATURE DERATING

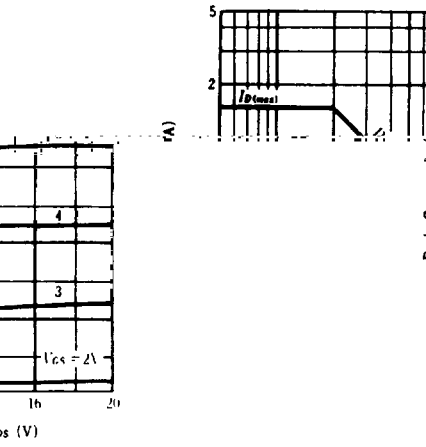


■ ELECTRICAL CHARACTERISTICS (T_a=25 °C)

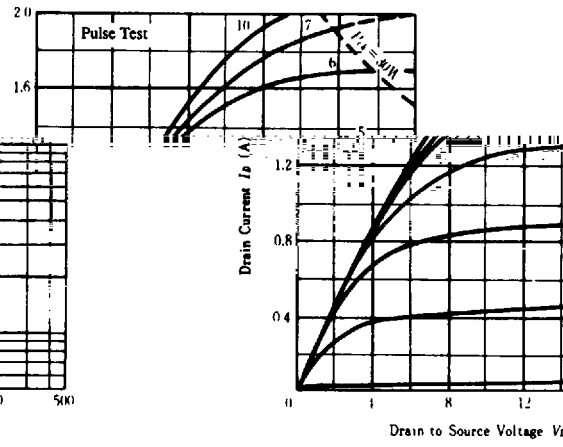
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Power Output	P_O	V_{DD}=80V, f=28MHz	10	16	—	W
Drain Efficiency	η	I_{DQ}=50mA, P_{in}=150mW	—	80	—	%
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=10mA, V_{GS}=0	180	—	—	V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	I_D=1mA, V_{DS}=10V	0.5	—	3.0	V
Drain Current	I_{DSS}	V_{DS}=140V, V_{GS}=0	—	—	1.0	mA
Drain-Source Saturation Voltage	$V_{DS(on)}$	I_D=1.0A, V_{GS}=10V*	—	6.5	8.0	V
Forward Transfer Admittance	$\|y_{fs}\|$	I_D=1.0A, V_{DS}=20V*	0.2	0.3	—	S
Input Capacitance	C_{iss}	V_{GS}=5V, V_{DS}=0, f=1MHz	—	100	—	pF
Output Capacitance	C_{oss}	V_{GS}=−5V, V_{DS}=50V, f=1MHz	—	20	—	pF
Reverse Transfer Capacitance	C_{rss}	V_{GD}=−50V, f=1MHz	—	0.2	—	pF
Power Output	P_O	V_{DD}=80V, f=28MHz	—	10	—	W_{PEP}
Power Gain	P.G	Δf=20kHz, IMD≦−30dB	—	20	—	dB

*Pulse Test

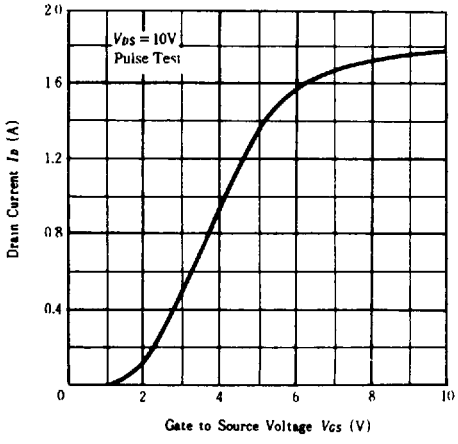
MAXIMUM SAFE OPERATION AREA



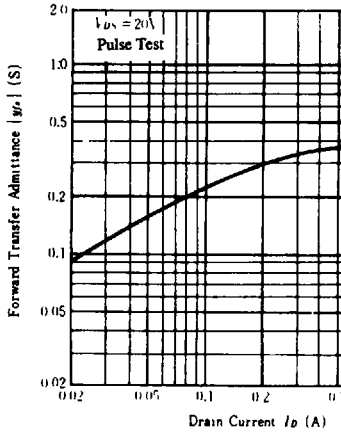
TYPICAL OUTPUT CHARACTERISTICS



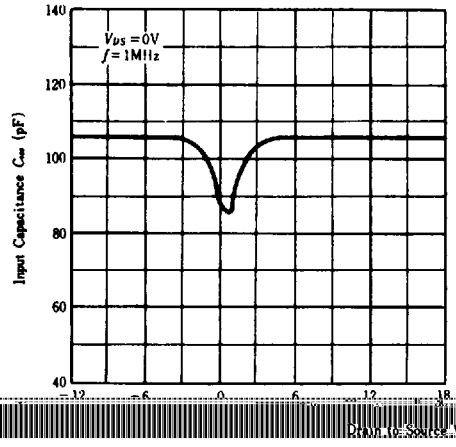
TYPICAL TRANSFER CHARACTERISTICS



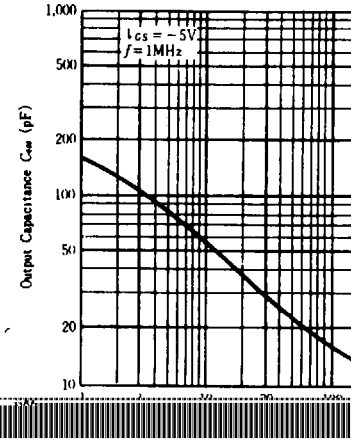
FORWARD TRANSFER ADMI
VS. DRAIN CURRENT



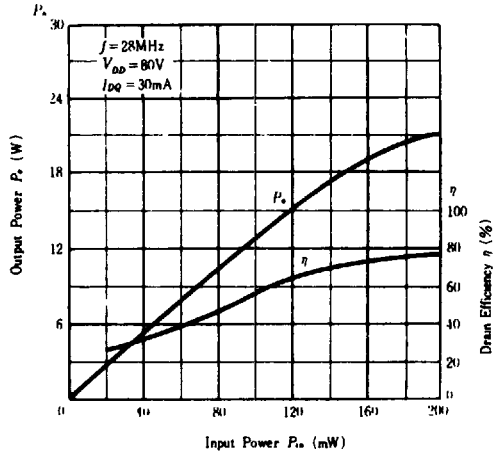
INPUT CAPACITANCE VS.
GATE-SOURCE VOLTAGE



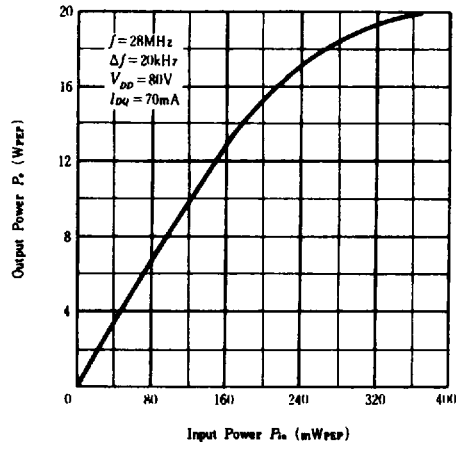
OUTPUT CAPACITANCE
DRAIN-SOURCE VOLTAG



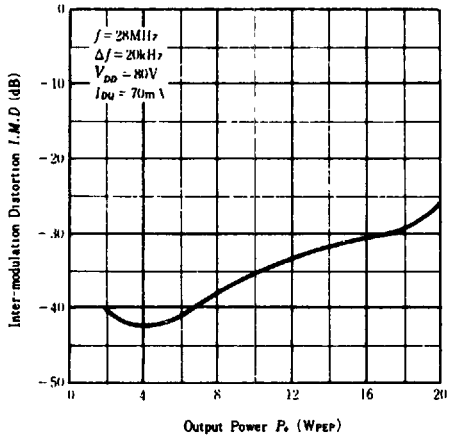
OUTPUT POWER, DRAIN EFFICIENCY VS. INPUT POWER



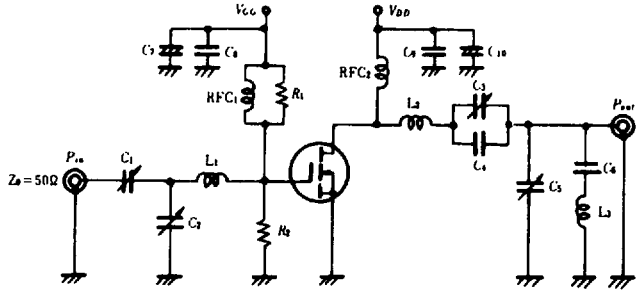
OUTPUT POWER VS. INPUT POWER (2 TONES)



INTER-MODULATION DISTORTION VS. OUTPUT POWER



28MHz Pout TEST CIRCUIT



C_1, C_2, C_3 = ~50pF
C_4 = 68pF
C_5 = ~20pF
C_6 = 1.5pF
C_7, C_8 = 0.1μF
C_9 = 4.7μF
C_{10} = 22μF
L_1 : ID=12mm, d=1.5mm, T=6T
L_2 : ID=12mm, d=1.5mm, T=9T
L_3 : ID=12mm, d=1.5mm, T=5T