ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

MITSUBISHI RF POWER MOS FET

RD06HHF1

Silicon MOSFET Power Transistor 30MHz,6W

DESCRIPTION

RD06HHF1 is a MOS FET type transistor specifically designed for HF RF power amplifiers applications.

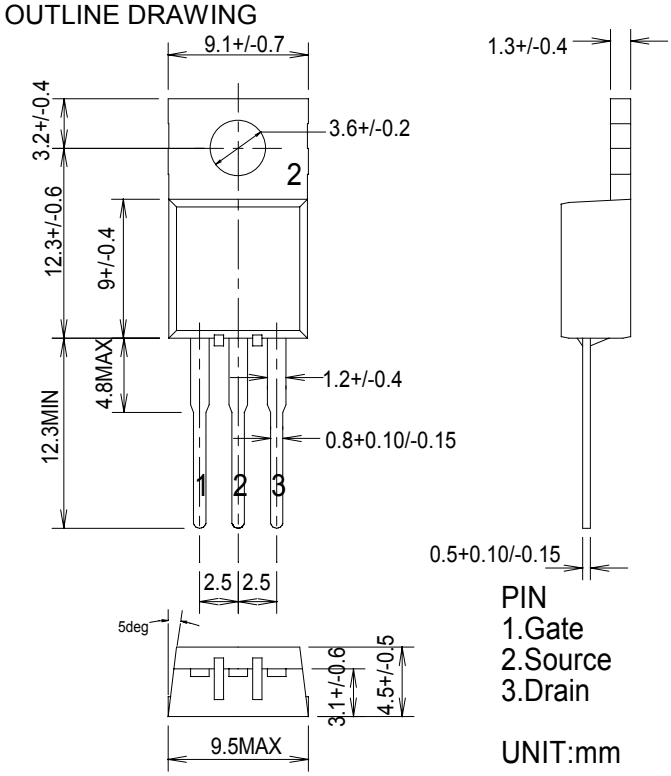
FEATURES

•High power gain:
Pout>6W, Gp>16dB @Vdd=12.5V,f=30MHz

APPLICATION

For output stage of high power amplifiers in HF band mobile radio sets.

OUTLINE DRAWING



ABSOLUTE MAXIMUM RATINGS

(Tc=25°C UNLESS OTHERWISE NOTED)

SYMBOL	PARAMETER	CONDITIONS	RATINGS	UNIT
VDSS	Drain to source voltage	Vgs=0V	50	V
VGSS	Gate to source voltage	Vds=0V	+/- 20	V
Pch	Channel dissipation	Tc=25°C	27.8	W
Pin	Input power	Zg=Zl=50Ω	0.3	W
ID	Drain current	-	3	A
Tch	Channel temperature	-	150	°C
Tstg	Storage temperature	-	-40 to +150	°C
Rth j-c	Thermal resistance	junction to case	4.5	°C/W

Note 1: Above parameters are guaranteed independently.

ELECTRICAL CHARACTERISTICS

(Tc=25°C, UNLESS OTHERWISE NOTED)

SYMBOL	PARAMETER	CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX.	
IDSS	Zero gate voltage drain current	VDS=17V, VGS=0V	-	-	10	uA
IGSS	Gate to source leak current	VGS=10V, VDS=0V	-	-	1	uA
VTH	Gate threshold Voltage	VDS=12V, IDS=1mA	1.9	-	4.9	V
Pout	Output power	VDD=12.5V, Pin=0.15W, f=30MHz, Idq=0.5A	6	10	-	W
ηD	Drain efficiency		55	65	-	%
	Load VSWR tolerance	VDD=15.2V,Po=6W(Pin Control) f=30MHz,Idq=0.5A,Zg=50Ω Load VSWR=20:1(All Phase)	No destroy			-

Note : Above parameters , ratings , limits and conditions are subject to change.

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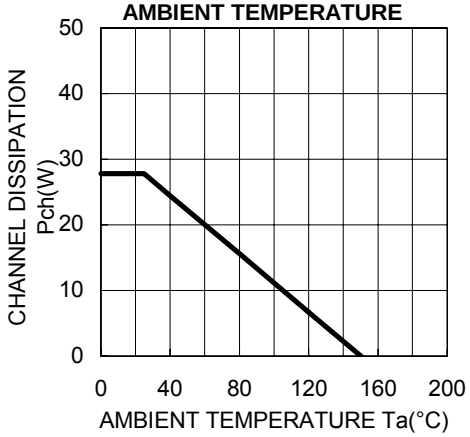
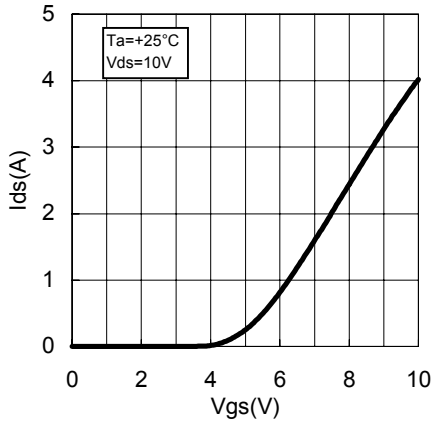
TYPICAL CHARACTERISTICS

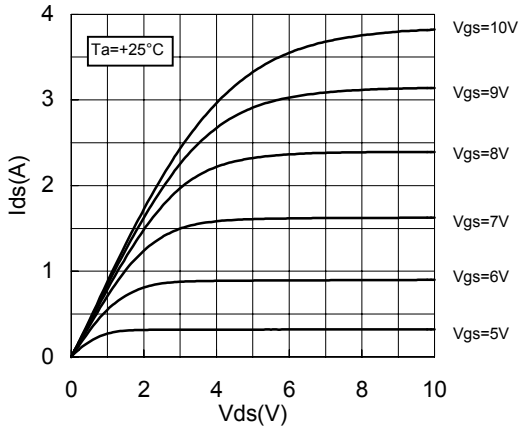
CHANNNEL DISSIPATION VS. AMBIENT TEMPERATURE



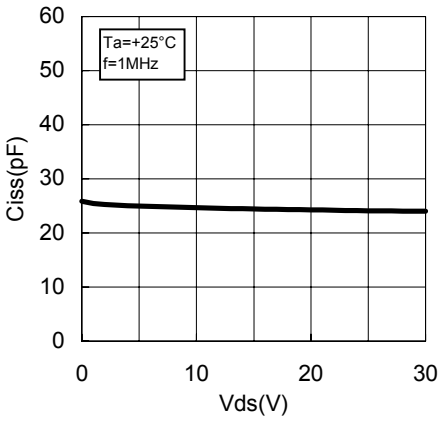
Vgs-Ids CHARACTERISTICS



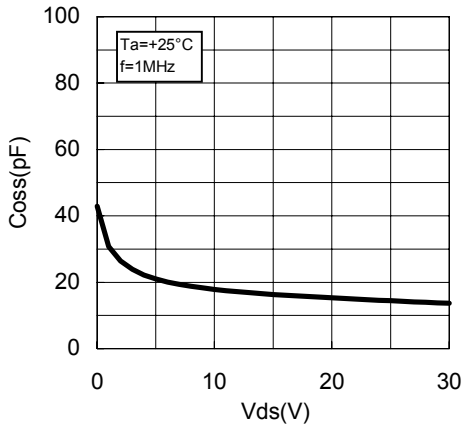
Vds-Ids CHARACTERISTICS



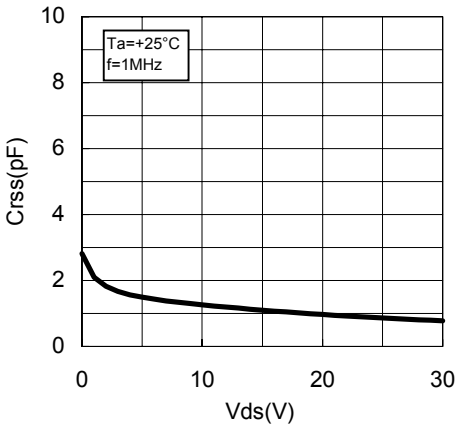
Vds VS. Ciss CHARACTERISTICS



Vds VS. Coss CHARACTERISTICS



Vds VS. Crss CHARACTERISTICS



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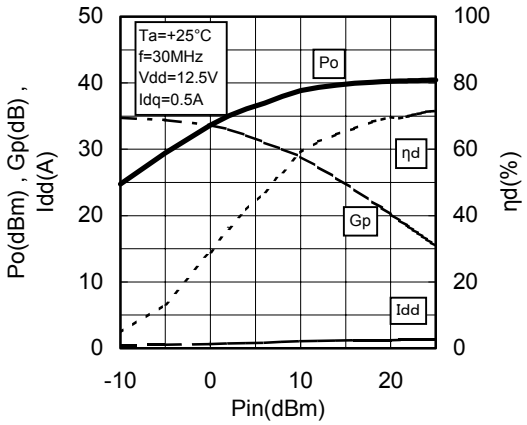
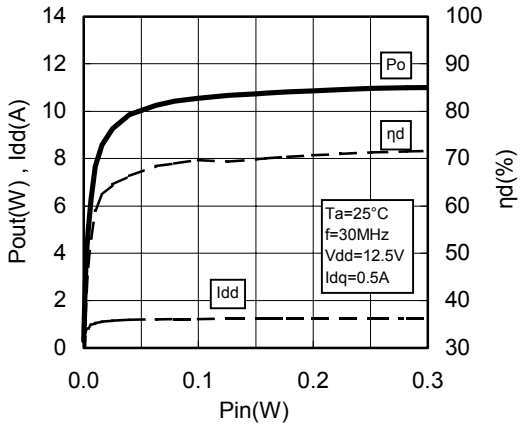
TYPICAL CHARACTERISTICS

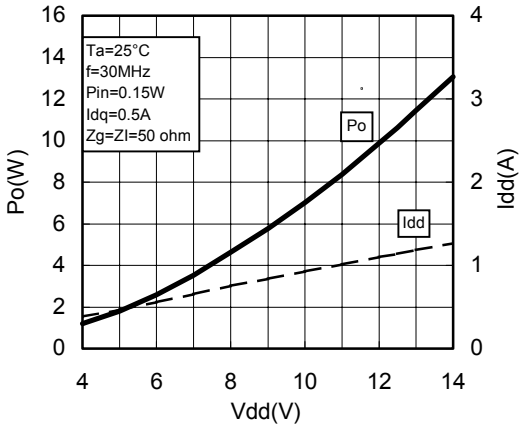
Pin-Po CHARACTERISTICS



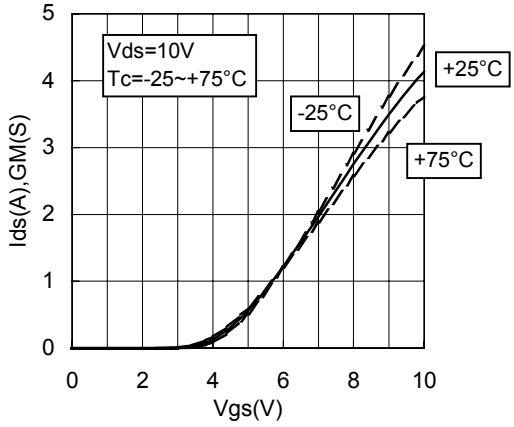
Pin-Po CHARACTERISTICS



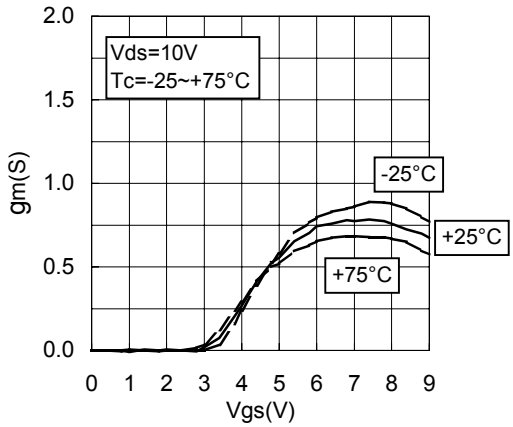
Vdd-Po CHARACTERISTICS



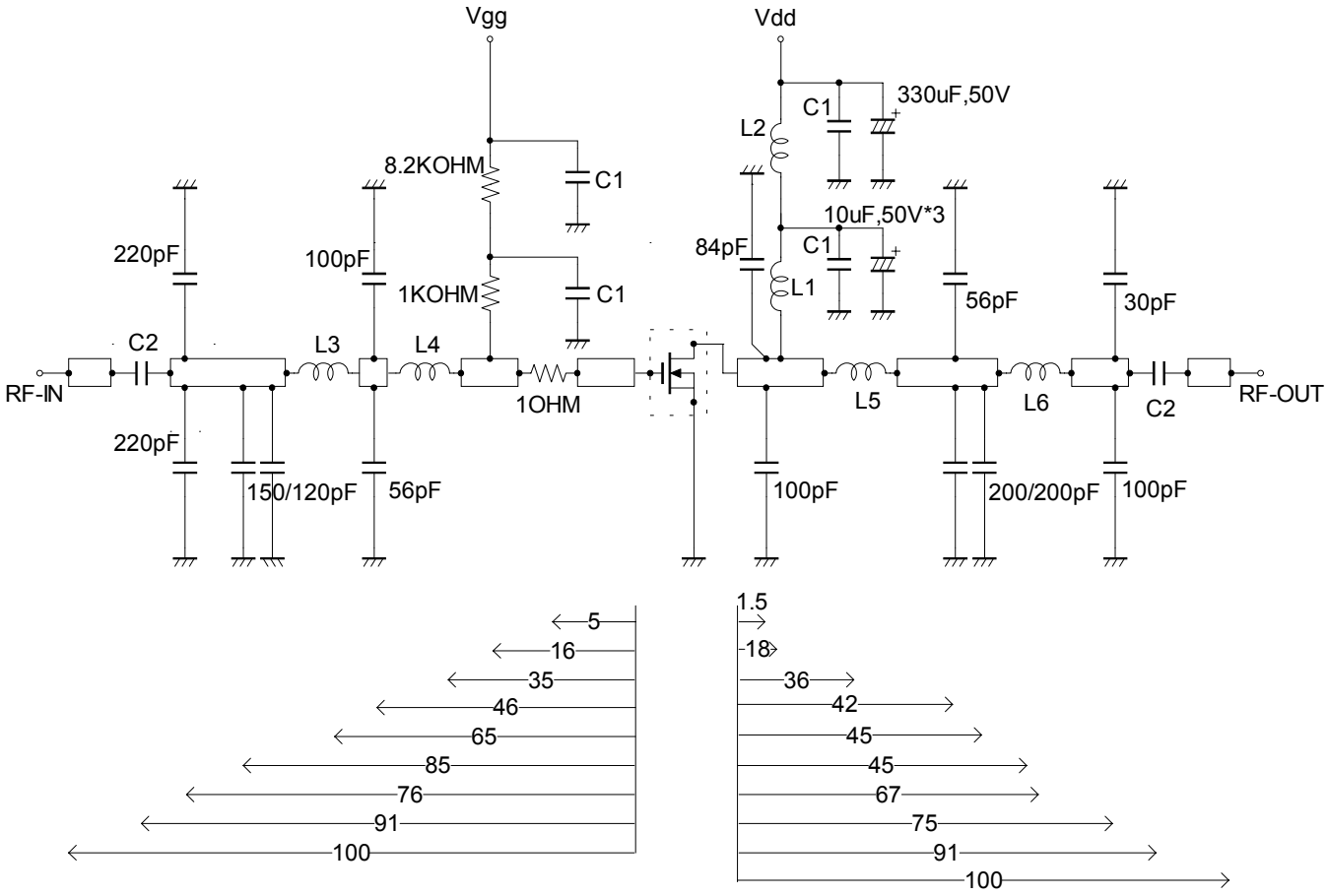
Vgs-Ids CHARACTORISTICS 2



Vgs-gm CHARACTORISTICS



TEST CIRCUIT(f=30MHz)

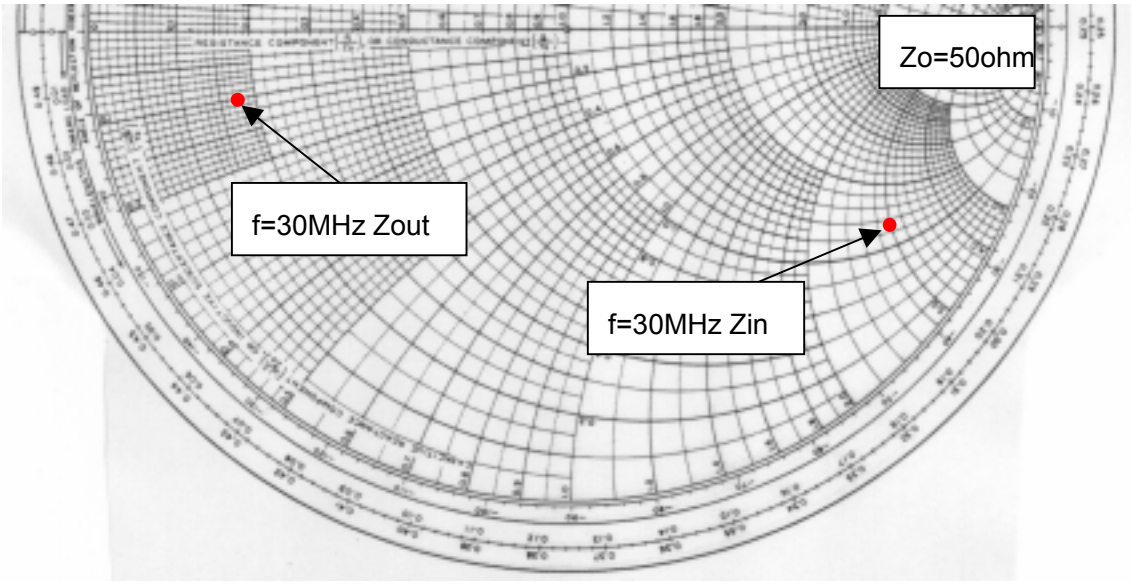


C1:100pF,0.022uF,0.1uF in parallel
C2:470uF*2 in parallel

L1:10Turns,I.D8mm,D0.9mm copper wire
L2:10Turns,I.D6mm,D1.6mm silver plated copper wire
L3:5Turns,I.D5.6mm,D0.9mm copper wire
L4:6Turns,I.D5.6mm,D0.9mm copper wire
L5:4Turns,I.D5.6mm,D0.9mm copper wire P=0.5mm
L6:7Turns,I.D5.6mm,D0.9mm copper wire

Dimensions:mm
Note:Board material- teflon substrate
micro strip line width=4.2mm/50OHM,er:2.7,t=1.6mm

INPUT/OUTPUT IMPEDANCE VS.FREQUENCY CHARACTERISTICS



Zin , Zout

f	Zin	Zout	
(MHz)	(ohm)	(ohm)	Conditions
30	65.06-j150.9	8.75-j4.92	Po=10W, Vdd=12.5V,Pin=0.15W

RD06HHF1 S-PARAMETER DATA (@Vdd=12.5V, Id=500mA)

Freq.	S11		S21		S12		S22	
[MHz]	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
10	0.985	-18.8	34.407	165.9	0.008	76.2	0.826	-17.3
30	0.900	-50.4	30.427	143.3	0.021	59.4	0.767	-43.6
50	0.799	-74.4	24.979	126.1	0.029	43.2	0.677	-65.0
100	0.667	-109.6	15.565	100.7	0.032	27.3	0.547	-96.8
150	0.636	-129.0	10.953	85.1	0.032	23.1	0.523	-113.4
200	0.630	-140.1	8.194	73.7	0.029	25.3	0.528	-124.7
250	0.645	-148.2	6.528	63.9	0.027	34.5	0.561	-132.7
300	0.663	-155.0	5.315	55.2	0.027	49.1	0.588	-139.6
350	0.685	-160.7	4.437	47.4	0.031	61.8	0.622	-145.9
400	0.708	-165.9	3.771	39.9	0.039	71.0	0.657	-151.7
450	0.729	-170.8	3.233	33.2	0.048	75.8	0.686	-157.0
500	0.752	-175.4	2.826	26.8	0.059	77.9	0.715	-162.3
550	0.771	179.9	2.475	20.7	0.070	76.9	0.743	-167.6
600	0.789	175.4	2.186	15.2	0.083	76.1	0.763	-172.3
650	0.804	171.2	1.943	9.7	0.095	73.7	0.789	-177.3
700	0.819	166.9	1.738	4.6	0.108	71.0	0.804	178.1
750	0.834	162.6	1.560	0.0	0.120	68.1	0.820	173.5
800	0.842	158.5	1.410	-4.5	0.133	65.0	0.837	169.0
850	0.851	154.3	1.275	-8.7	0.145	61.6	0.847	164.8
900	0.859	150.3	1.160	-12.6	0.157	58.2	0.858	160.2
950	0.866	146.2	1.058	-16.9	0.167	54.5	0.869	155.7
1000	0.870	142.3	0.963	-20.0	0.179	51.0	0.876	151.8

Keep safety first in your circuit designs!

Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.

warning !

Do not use the device at the exceeded the maximum rating condition. In case of plastic molded devices, the exceeded maximum rating condition may cause blowout, smoldering or catch fire of the molding resin due to extreme short current flow between the drain and the source of the device. These results causes in fire or injury.