

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

mitsubishi RF POWER MOS FET

RD30HUF1

RoHS Compliance, Silicon MOSFET Power Transistor, 520MHz, 30W

DESCRIPTION

RD30HUF1 is a MOS FET type transistor specifically designed for UHF RF power amplifiers applications.

FEATURES

High power gain:

$P_{out} > 30W$, $G_p > 10dB$ @ $V_{dd} = 12.5V$, $f = 520MHz$

High Efficiency: 55% typ.

APPLICATION

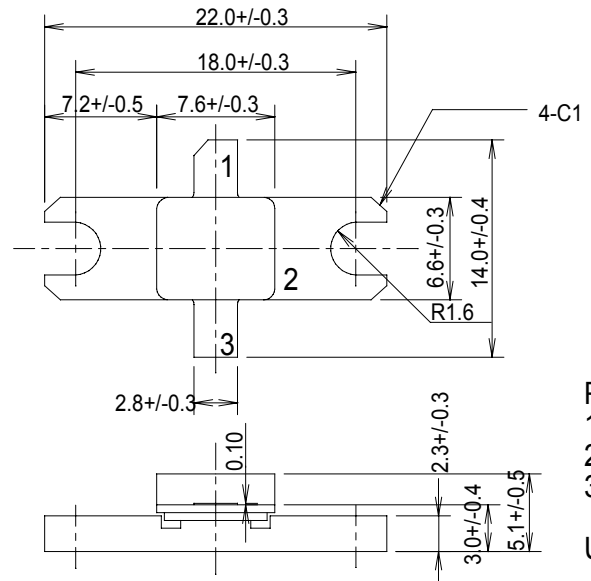
For output stage of high power amplifiers in UHF band mobile radio sets.

RoHS COMPLIANT

RD30HUF1-101 is a RoHS compliant products.

RoHS compliance is indicate by the letter "G" after the Lot Marking.

OUTLINE DRAWING



PIN
1. Drain
2. Source
3. Gate

UNIT: mm

ABSOLUTE MAXIMUM RATINGS

($T_c = 25^\circ C$ UNLESS OTHERWISE NOTED)

SYMBOL	PARAMETER	CONDITIONS	RATINGS	UNIT
V_{DSS}	Drain to source voltage	$V_{GS} = 0V$	30	V
V_{GSS}	Gate to source voltage	$V_{DS} = 0V$	+/-20	V
P_{ch}	Channel dissipation	$T_c = 25^\circ C$	75	W
P_{in}	Input power	$Z_g = Z_l = 50\Omega$	7.5	W
I_D	Drain current	-	7	A
T_{ch}	Channel temperature	-	175	$^\circ C$
T_{stg}	Storage temperature	-	-40 to +175	$^\circ C$
$R_{th j-c}$	Thermal resistance	junction to case	2.0	$^\circ C/W$

Note 1: Above parameters are guaranteed independently.

ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ C$, UNLESS OTHERWISE NOTED)

SYMBOL	PARAMETER	CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX.	
I_{DSS}	Zero gate voltage drain current	$V_{DS} = 17V$, $V_{GS} = 0V$	-	-	200	μA
I_{GSS}	Gate to source leak current	$V_{GS} = 10V$, $V_{DS} = 0V$	-	-	1	μA
V_{TH}	Gate threshold voltage	$V_{DS} = 12V$, $I_{DS} = 1mA$	1.2	1.7	2.2	V
P_{out}	Output power	$f = 520MHz$, $V_{DD} = 12.5V$	30	35	-	W
η_{D1}	Drain efficiency	$P_{in} = 3W$, $I_{DQ} = 1.0A$	50	55	-	%
	Load VSWR tolerance	$V_{DD} = 15.2V$, $P_o = 30W$ (PinControl) $f = 520MHz$, $I_{DQ} = 1.0A$, $Z_g = 50\Omega$ Load VSWR=20:1 (All Phase)	No destroy			-

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



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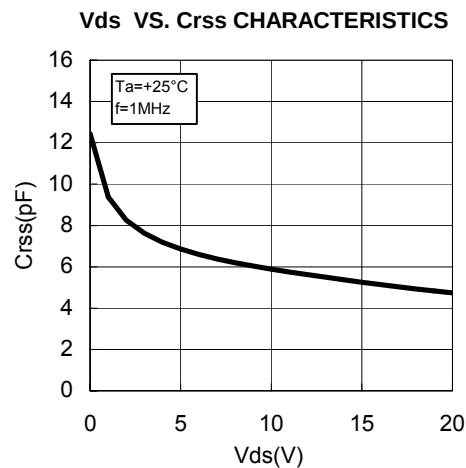
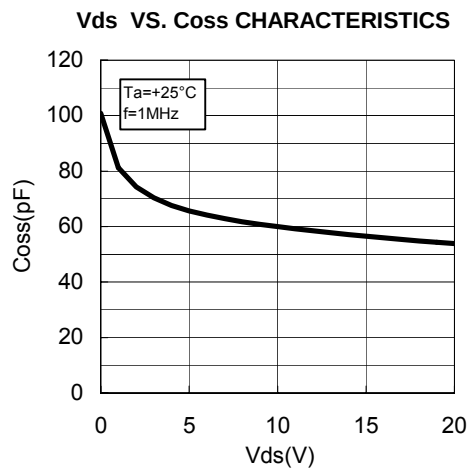
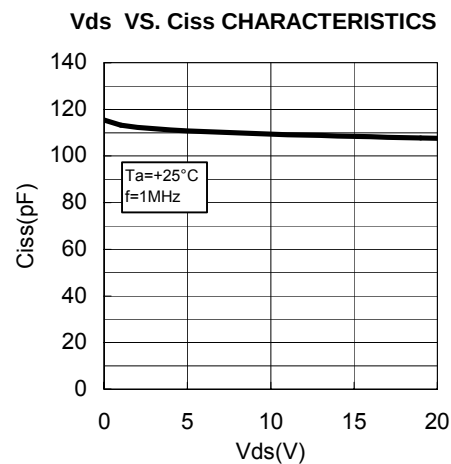
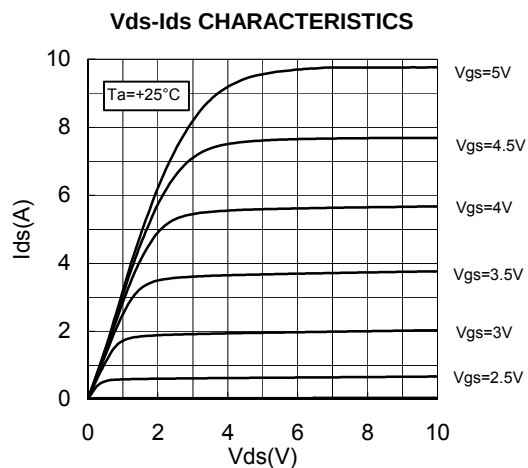
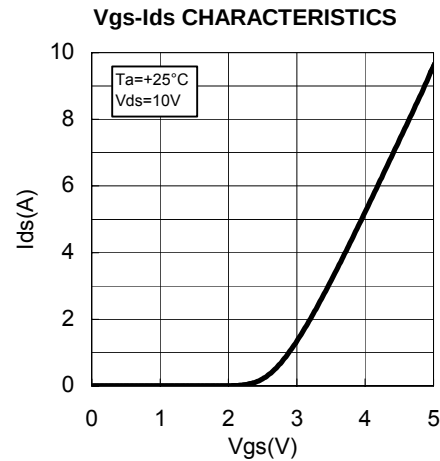
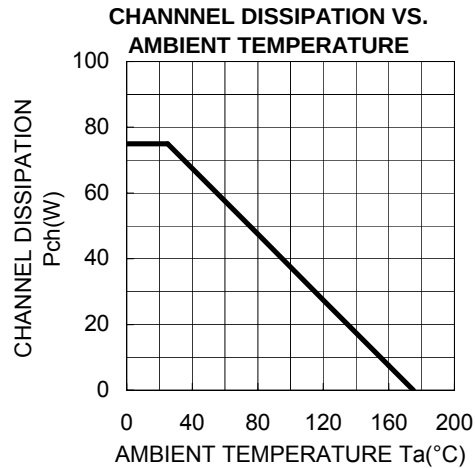
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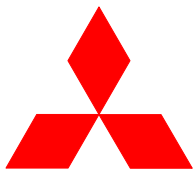
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RoHS Compliance,

Silicon MOSFET Power Transistor, 520MHz, 30W

TYPICAL CHARACTERISTICS





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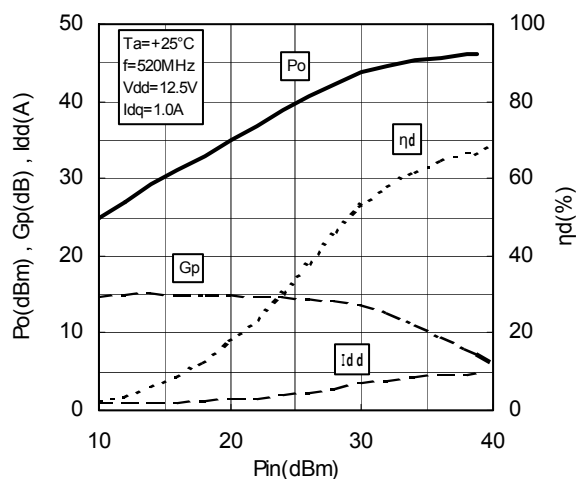
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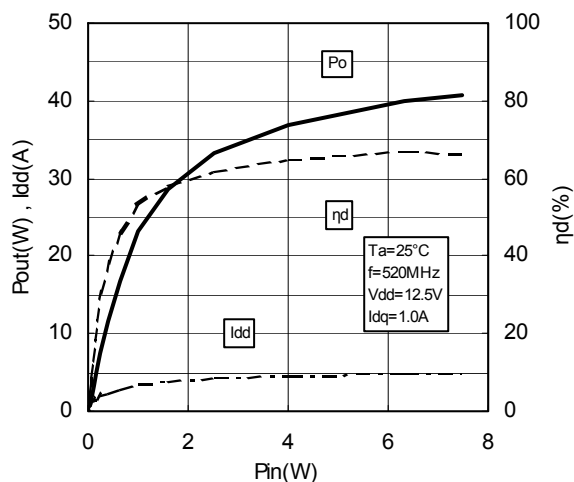
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TYPICAL CHARACTERISTICS

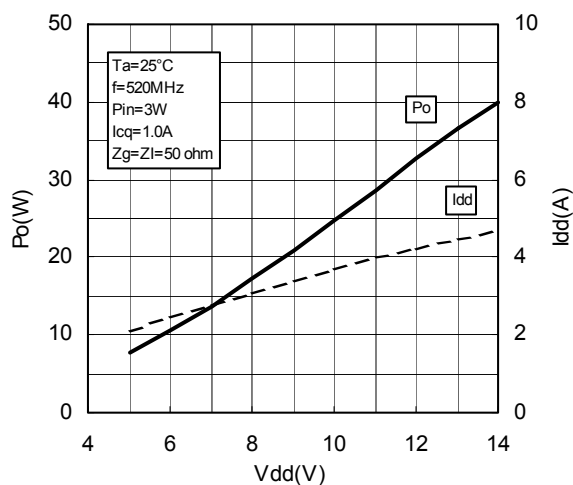
Pin-Po CHARACTERISTICS



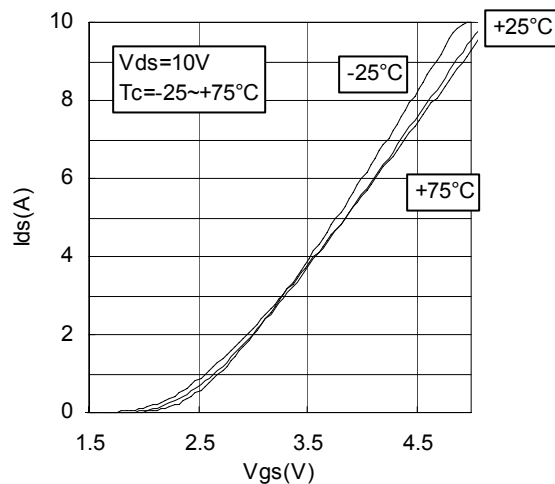
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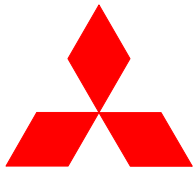


Vdd-Po CHARACTERISTICS



Vgs-Ids CHARACTERISTICS 2





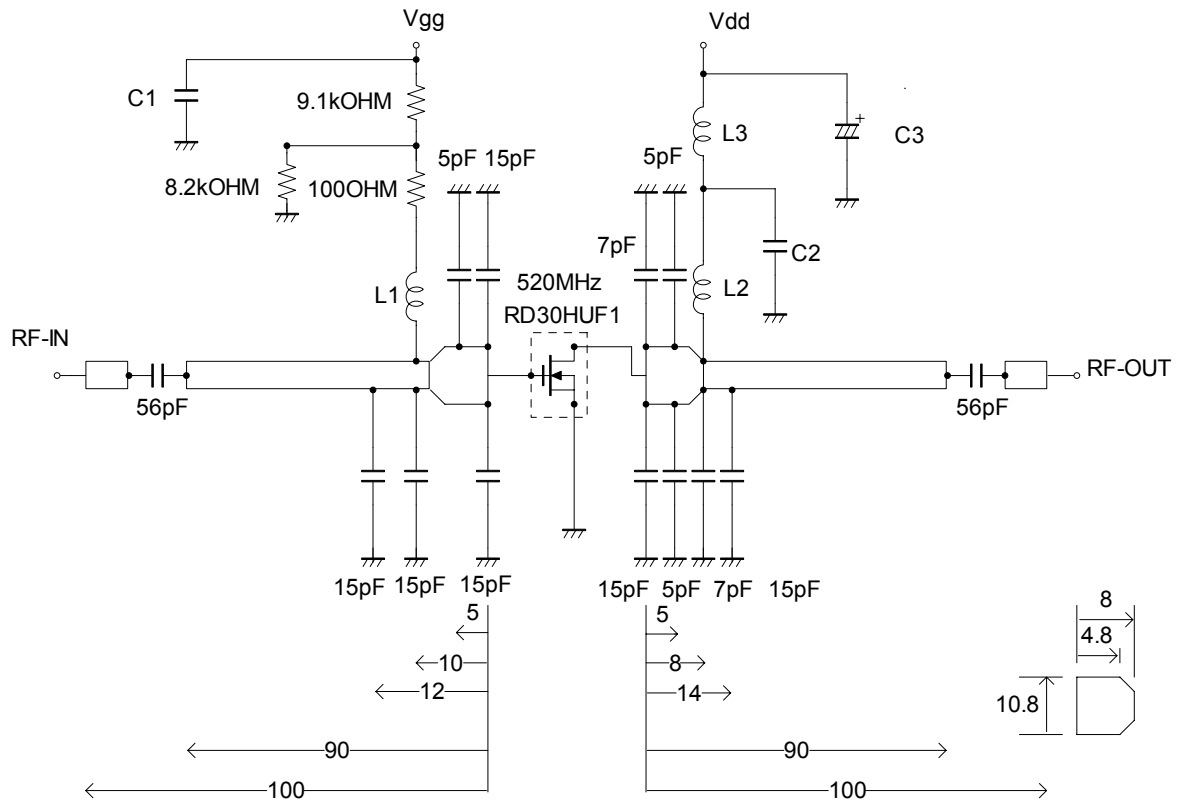
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TEST CIRCUIT(f=520MHz)

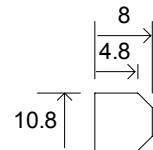


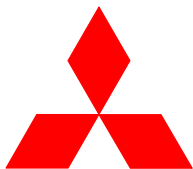
C1:2200pF 10uF in parallel
C2:2200pF*2 in parallel
C3:2200pF,330uF in parallel

L1:3Turns,I.D6mm,D1.6mm P=1 silver plateted copper wire
L2:2Turns,I.D6mm,D1.6mm P=1 silver plateted copper wire
L3:4Turns,I.D6mm,D1.6mm P=1 silver plateted copper wire

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

Dimensions:mm





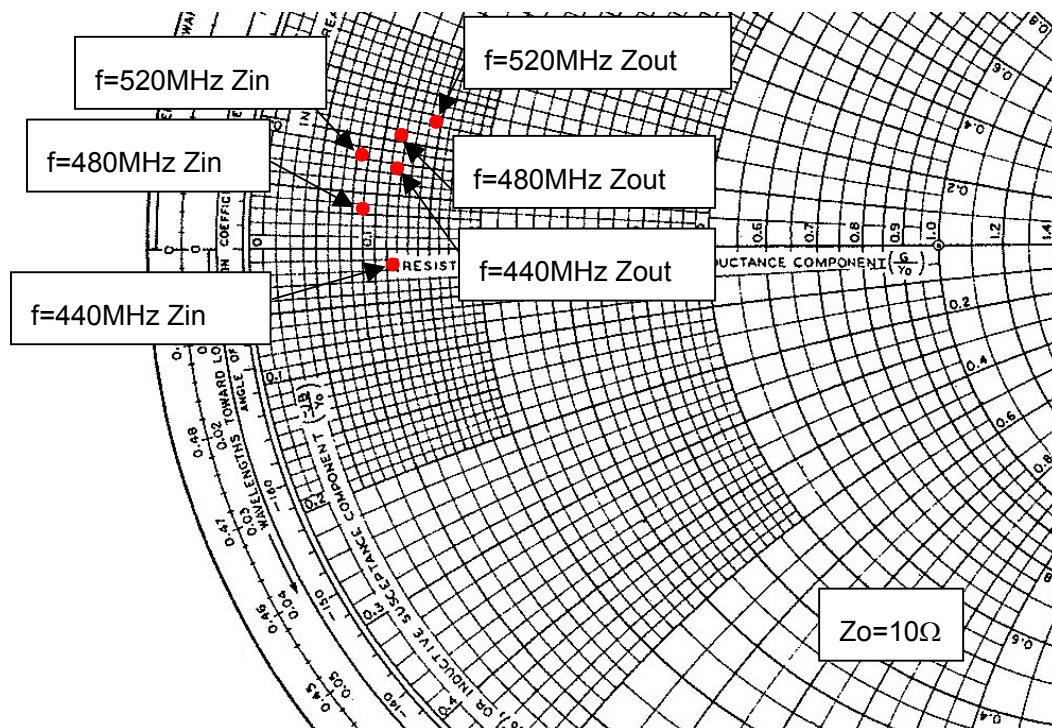
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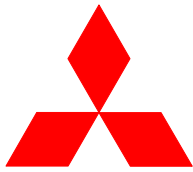
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INPUT/OUTPUT IMPEDANCE VS. FREQUENCY CHARACTERISTICS



Zin , Zout

F (MHz)	Zin (ohm)	Zout (ohm)	Conditions
440	1.16-j0.14	1.17+j0.74	Po=40W, Vdd=12.5V, Pin=3.0W
480	0.90+j0.35	1.15+j1.07	Po=38W, Vdd=12.5V, Pin=3.0W
520	0.88+j0.84	1.47+j1.24	Po=35W, Vdd=12.5V, Pin=3.0W



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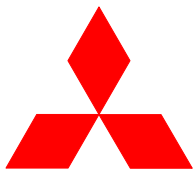
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RD30HUF1 S-PARAMETER DATA (@Vdd=12.5V, Id=500mA)

Freq. [MHz]	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
100	0.870	-173.4	7.566	74.2	0.016	-8.8	0.723	-170.2
150	0.880	-177.3	4.825	63.2	0.015	-18.0	0.748	-172.5
200	0.890	-179.5	3.398	55.1	0.013	-23.7	0.778	-173.9
250	0.902	178.2	2.568	47.0	0.011	-27.9	0.817	-175.6
300	0.911	176.0	1.982	40.2	0.010	-31.1	0.832	-177.6
350	0.921	174.1	1.588	34.5	0.008	-31.3	0.857	-179.7
400	0.930	172.1	1.299	29.0	0.007	-29.2	0.879	178.3
450	0.931	170.0	1.070	23.9	0.005	-21.8	0.887	176.3
500	0.941	168.0	0.907	20.3	0.004	-9.5	0.901	174.2
520	0.946	167.1	0.852	18.7	0.004	-3.9	0.908	173.4
550	0.946	166.3	0.780	15.9	0.004	7.5	0.913	172.3
600	0.947	164.2	0.673	12.5	0.004	28.3	0.916	170.5
650	0.951	162.5	0.589	10.1	0.004	46.8	0.928	168.6
700	0.957	160.7	0.522	6.6	0.006	53.0	0.932	166.7
750	0.960	159.1	0.464	4.1	0.007	56.5	0.936	164.9
800	0.962	157.6	0.419	2.2	0.007	63.6	0.942	163.1
850	0.962	155.8	0.383	-1.2	0.009	64.1	0.945	161.6
900	0.962	154.2	0.341	-3.0	0.009	63.5	0.946	160.0
950	0.961	152.7	0.318	-4.2	0.010	65.6	0.952	158.2
1000	0.961	151.2	0.296	-7.4	0.012	65.3	0.955	157.0
1050	0.965	149.6	0.270	-8.3	0.012	64.6	0.955	155.4
1100	0.964	148.2	0.259	-9.4	0.014	64.8	0.957	153.6



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—————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.