ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

MITSUBISHI RF POWER MOS FET

RD07MVS2

RoHS Compliance,Silicon MOSFET Power Transistor,175MHz,520MHz,7W

DESCRIPTION

RD07MVS2 is a MOS FET type transistor specifically designed for VHF/UHF RF po -wer amplifiers applications.
This device have an interal monolithic zener diode from gate to source for ESD protection.

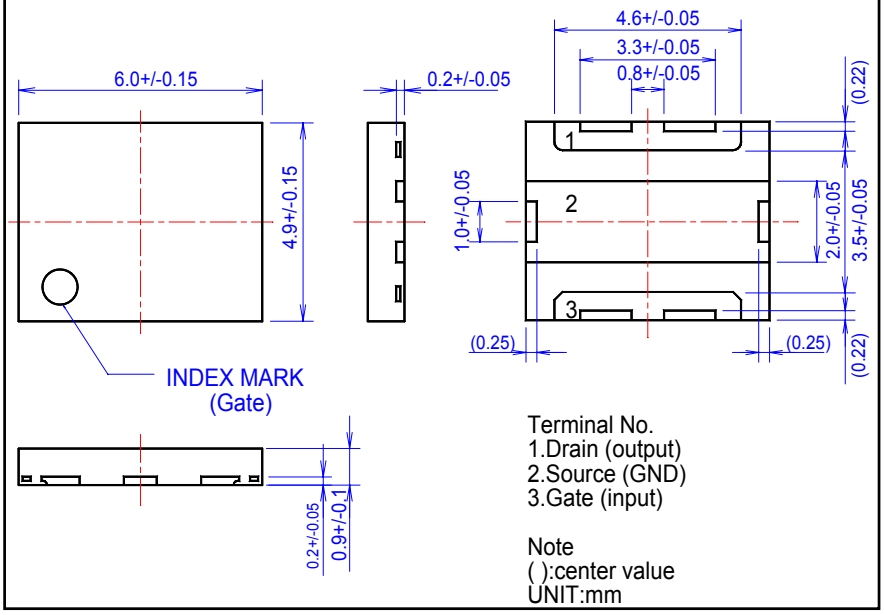
FEATURES

•High power gain:
Pout>7W, Gp>10dB
@Vdd=7.2V,f=520MHz
•High Efficiency: 60%typ. (175MHz)
•High Efficiency: 55%typ. (520MHz)
•Integrated gate protection diode

APPLICATION

For output stage of high power amplifiers
In VHF/UHF band mobile radio sets.

OUTLINE DRAWING



RoHS COMPLIANT

RD07MVS2-101,T112 is a RoHS compliant products.
RoHS compliance is indicate by the letter “G” after the Lot Marking.
This product include the lead in high melting temperature type solders.
How ever,it applicable to the following exceptions of RoHS Directions.
1.Lead in high melting temperature type solders(i.e.tin-lead solder alloys containing more than85% lead.)

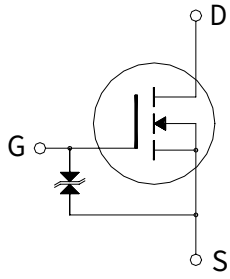
RD07MVS2

RoHS Compliance,Silicon MOSFET Power Transistor,175MHz,520MHz,7W

ABSOLUTE MAXIMUM RATINGS

(Tc=25°C UNLESS OTHERWISE NOTED)

SYMBOL	PARAMETER	CONDITIONS	RATINGS	UNIT
VDSS	Drain to source voltage	Vgs=0V	30	V
VGSS	Gate to source voltage	Vds=0V	-5/+10	V
Pch	Channel dissipation	Tc=25°C	50	W
Pin	Input Power	Zg=Zl=50Ω	1.5	W
ID	Drain Current	-	3	A
Tch	Junction Temperature	-	150	°C
Tstg	Storage temperature	-	-40 to +125	°C
Rth j-c	Thermal resistance	Junction to case	2.5	°C/W



SCHEMATIC DRAWING

Note 1: Above parameters are guaranteed independently.

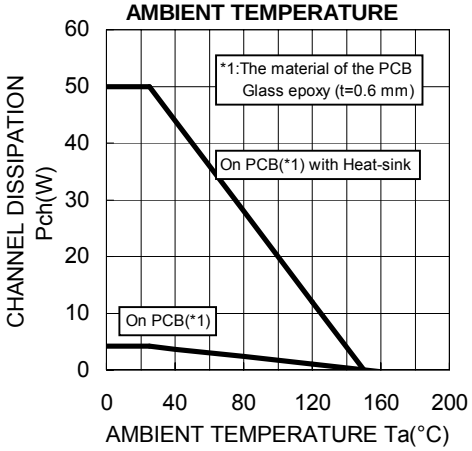
ELECTRICAL CHARACTERISTICS (Tc=25°C, UNLESS OTHERWISE NOTED)

SYMBOL	PARAMETER	CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX.	
IDSS	Zero gate voltage drain current	VDS=17V, VGS=0V	-	-	200	uA
IGSS	Gate to source leak current	VGS=10V, VDS=0V	-	-	1	uA
VTH	Gate threshold Voltage	VDS=12V, IDS=1mA	1.4	1.7	2.4	V
Pout1	Output power	f=175MHz , VDD=7.2V	7	8	-	W
ηD1	Drain efficiency	Pin=0.3W,Idq=700mA	55	60	-	%
Pout2	Output power	f=520MHz , VDD=7.2V	7	8	-	W
ηD2	Drain efficiency	Pin=0.7W,Idq=750mA	50	55	-	%
	Load VSWR tolerance	VDD=9.2V,Po=7W(Pin Control) f=175MHz,Idq=700mA,Zg=50Ω Load VSWR=20:1(All Phase)	No destroy			-
	Load VSWR tolerance	VDD=9.2V,Po=7W(Pin Control) f=520MHz,Idq=750mA,Zg=50Ω Load VSWR=20:1(All Phase)	No destroy			-

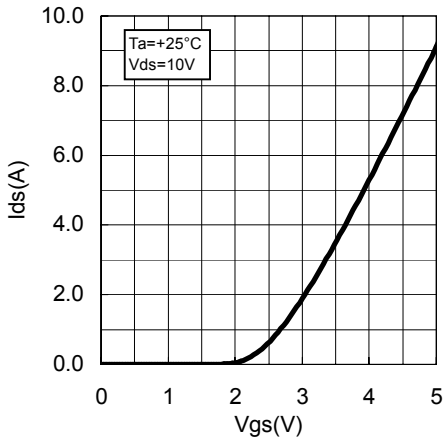
Note : Above parameters , ratings , limits and conditions are subject to change.

TYPICAL CHARACTERISTICS

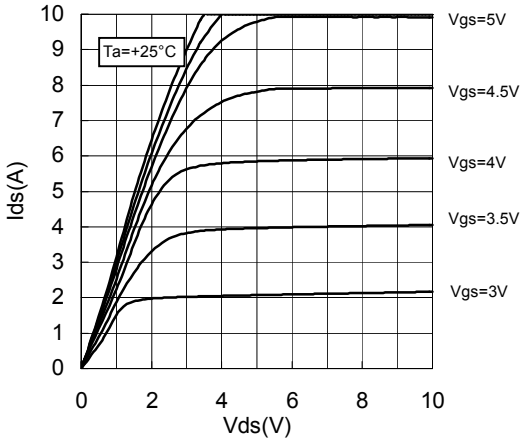
DRAIN DISSIPATION VS. AMBIENT TEMPERATURE



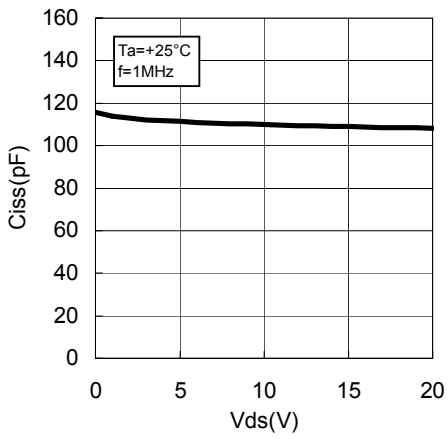
Vgs-Ids CHARACTERISTICS



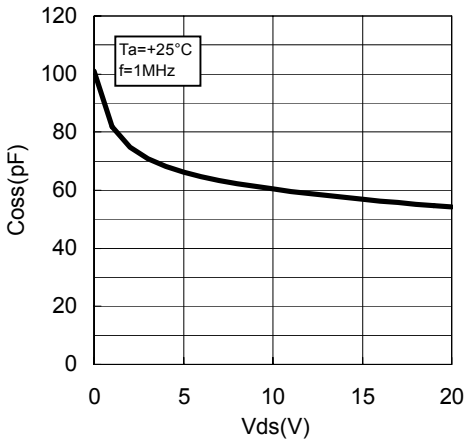
Vds-Ids CHARACTERISTICS



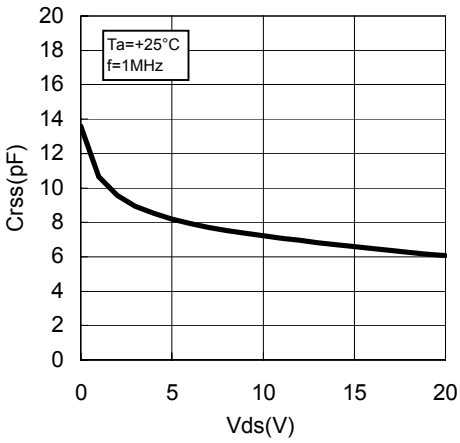
Vds VS. Ciss CHARACTERISTICS



Vds VS. Coss CHARACTERISTICS

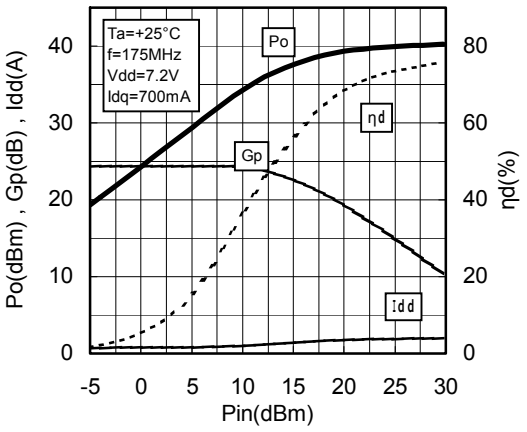


Vds VS. Crss CHARACTERISTICS

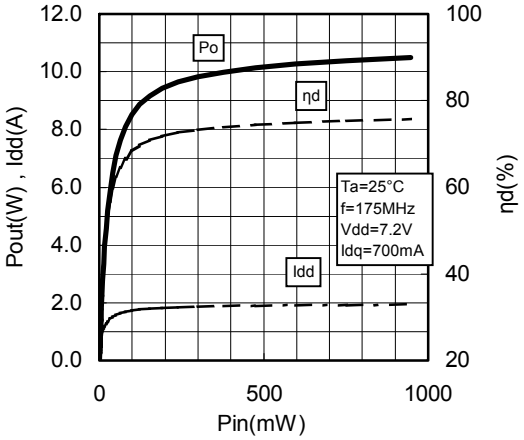


TYPICAL CHARACTERISTICS

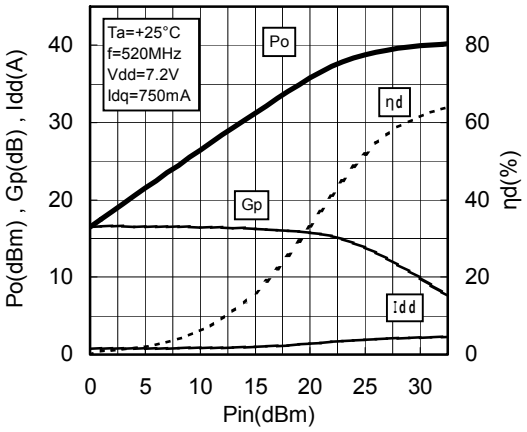
Pin-Po CHARACTERISTICS @f=175MHz



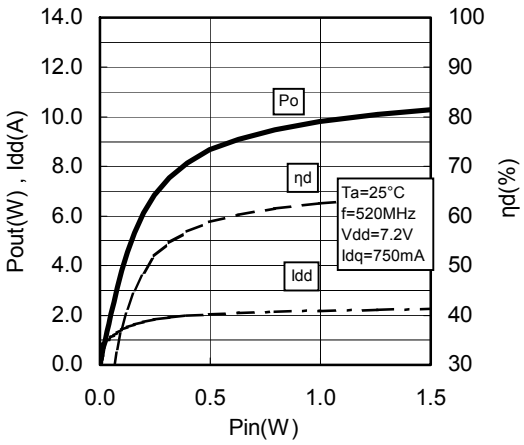
Pin-Po CHARACTERISTICS @f=175MHz



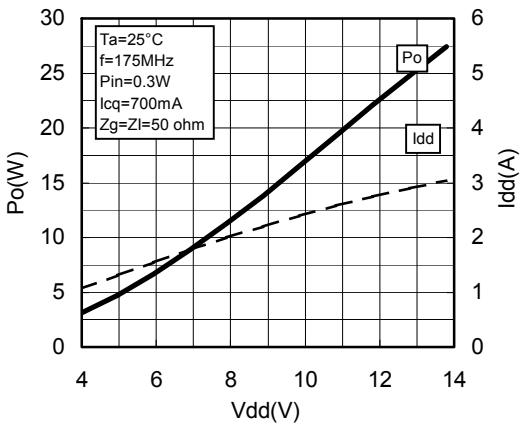
Pin-Po CHARACTERISTICS @f=520MHz



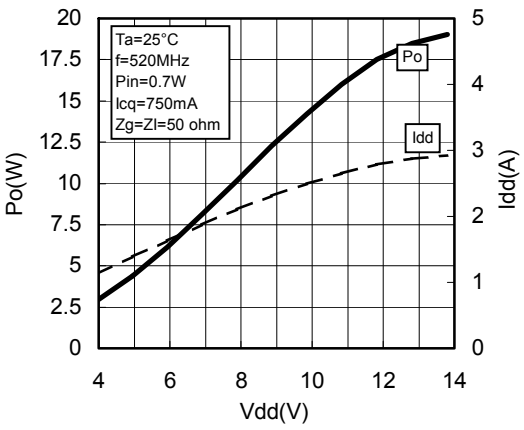
Pin-Po CHARACTERISTICS @f=520MHz



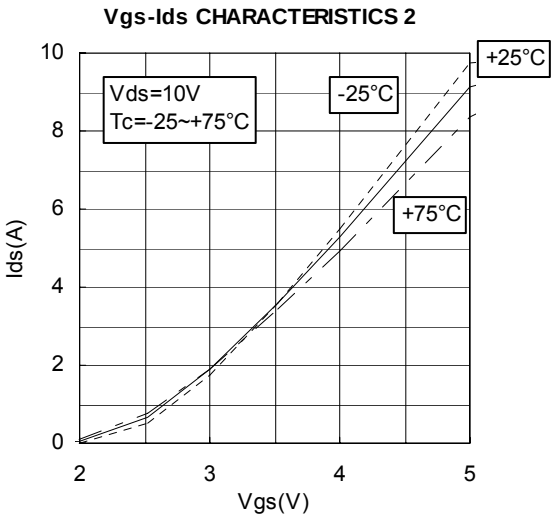
Vdd-Po CHARACTERISTICS @f=175MHz



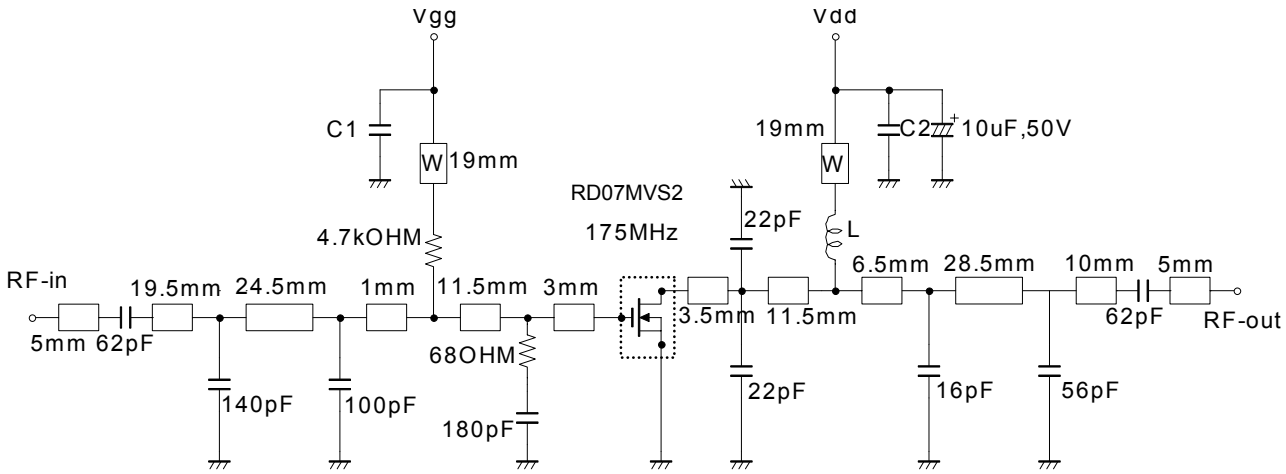
Vdd-Po CHARACTERISTICS @f=520MHz



TYPICAL CHARACTERISTICS



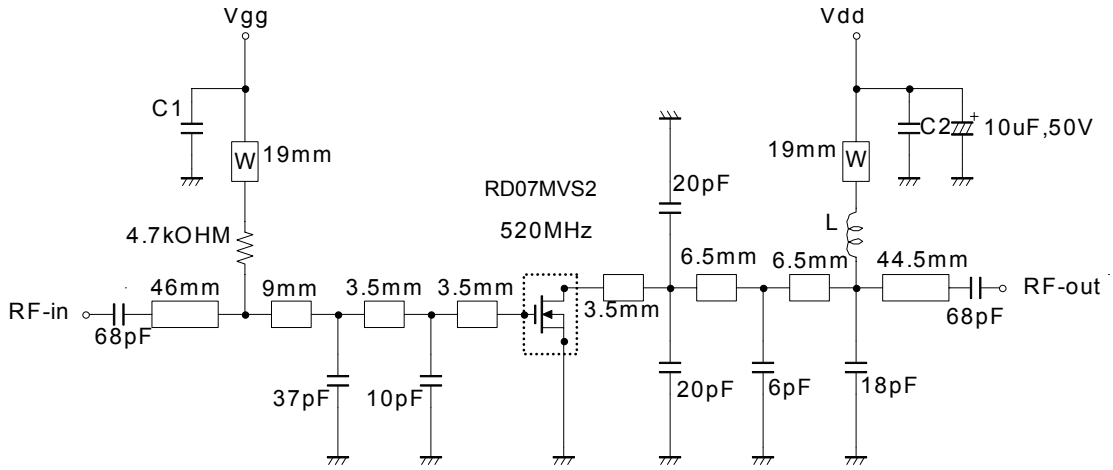
TEST CIRCUIT(f=175MHz)



L: Enameled wire 7Turns,D:0.43mm,2.46mmO.D
C1,C2:1000pF,0.022uF in parallel

Note:Board material- Teflon substrate
Micro strip line width=2.2mm/50OHM,er:2.7,t=0.8mm
W:line width=1.0mm

TEST CIRCUIT(f=520MHz)

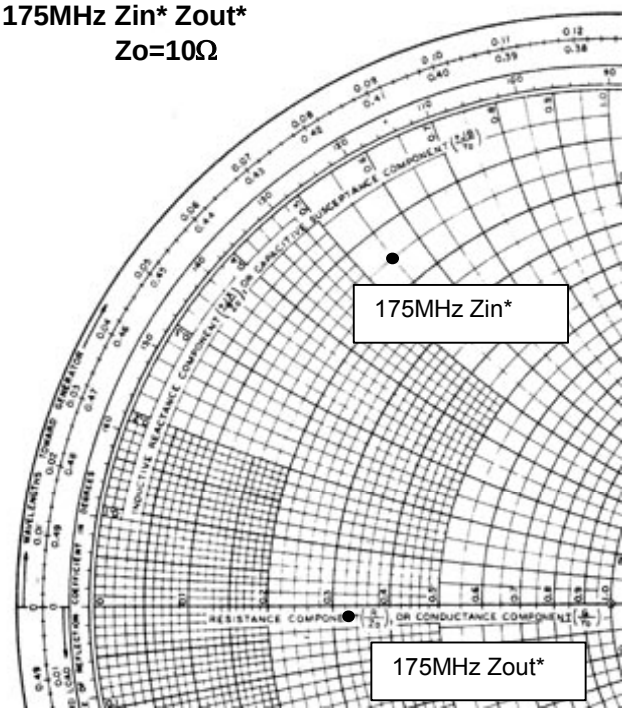


L: Enameled wire 5Turns,D:0.43mm,2.46mmO.D
C1,C2:1000pF,0.022uF in parallel

Note:Board material- Teflon substrate
Micro strip line width=2.2mm/50OHM,er:2.7,t=0.8mm
W:ine width=1.0mm

INPUT/OUTPUT IMPEDANCE VS. FREQUENCY CHARACTERISTICS

175MHz Zin* Zout*
Zo=10Ω

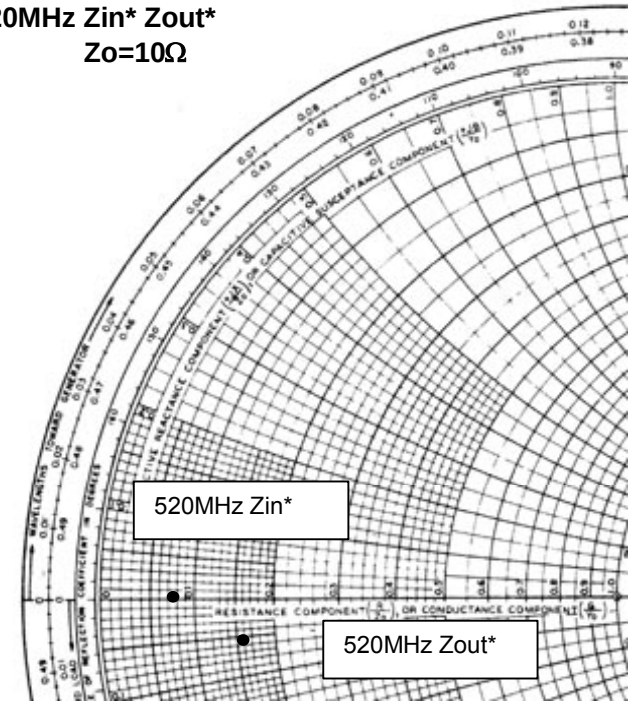


Vdd=7.2V, Idq=700mA(Vgg adj.),Pin=0.28W

Zin*=1.55+j5.53
Zout*=3.24-j0.26

Zin*: Complex conjugate of input impedance
Zout*: Complex conjugate of input impedance

520MHz Zin* Zout*
Zo=10Ω



Vdd=7.2V, Idq=750mA(Vgg adj.),Pin=0.7W

Zin*=0.76+j0.06
Zout*=1.61-j0.52

Zin*: Complex conjugate of input impedance
Zout*: Complex conjugate of input impedance

RD07MSV2 S-PARAMETER DATA (@Vdd=7.2V, Id=750mA)

Freq.	S11		S21		S12		S22	
[MHz]	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
100	0.899	-175.3	5.567	79.3	0.015	-9.4	0.792	-173.5
150	0.903	-177.2	3.576	71.1	0.015	-17.0	0.790	-175.1
175	0.903	-177.7	3.002	68.3	0.014	-18.8	0.799	-174.8
200	0.909	-178.4	2.602	65.1	0.015	-22.7	0.823	-174.7
250	0.911	-179.0	1.987	58.3	0.014	-28.8	0.829	-175.4
300	0.919	-179.6	1.585	53.4	0.012	-32.8	0.842	-175.7
350	0.923	179.7	1.291	47.9	0.012	-37.7	0.866	-176.3
400	0.927	178.9	1.062	43.4	0.011	-39.8	0.864	-176.5
450	0.931	178.5	0.902	39.1	0.010	-38.9	0.887	-177.3
500	0.934	177.8	0.749	35.7	0.009	-40.4	0.896	-177.8
520	0.939	177.6	0.715	33.6	0.008	-43.4	0.895	-177.8
550	0.940	177.3	0.656	31.6	0.008	-41.3	0.901	-178.3
600	0.942	176.8	0.576	29.9	0.007	-52.0	0.916	-179.4
650	0.944	176.2	0.502	26.0	0.007	-45.6	0.914	-179.4
700	0.948	175.6	0.437	24.4	0.006	-52.8	0.925	179.7
750	0.948	175.4	0.393	21.7	0.004	-58.3	0.929	179.3
800	0.950	174.7	0.344	18.8	0.005	-53.1	0.927	178.9
850	0.953	174.3	0.303	17.0	0.004	-51.4	0.937	178.2
900	0.951	174.1	0.279	15.1	0.003	-52.0	0.931	178.2
950	0.954	173.5	0.243	12.6	0.003	-40.6	0.937	177.4
1000	0.954	173.2	0.236	10.9	0.002	-21.3	0.942	177.4
1050	0.956	172.9	0.201	12.4	0.001	-44.2	0.941	177.2
1100	0.956	172.7	0.193	9.8	0.002	-13.4	0.943	176.7

RD07MSV2 S-PARAMETER DATA (@Vdd=12.5V, Id=750mA)

Freq.	S11		S21		S12		S22	
[MHz]	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
100	0.897	-173.6	5.995	78.6	0.016	-8.7	0.763	-172.0
150	0.899	-176.0	3.832	69.8	0.016	-15.9	0.764	-173.3
175	0.904	-176.8	3.224	66.6	0.016	-21.2	0.778	-173.5
200	0.906	-177.3	2.776	62.8	0.015	-22.5	0.800	-173.2
250	0.910	-178.3	2.100	56.4	0.013	-28.7	0.813	-173.2
300	0.919	-179.0	1.662	50.8	0.013	-30.5	0.826	-174.1
350	0.926	-179.9	1.356	45.0	0.011	-37.5	0.853	-174.6
400	0.929	179.3	1.107	40.4	0.011	-44.2	0.860	-175.0
450	0.936	178.6	0.925	36.5	0.010	-44.4	0.879	-175.9
500	0.937	177.9	0.788	31.8	0.009	-49.0	0.891	-176.5
520	0.939	177.6	0.732	30.8	0.008	-52.4	0.893	-176.6
550	0.943	177.2	0.668	28.9	0.008	-55.9	0.897	-177.3
600	0.942	176.6	0.582	26.1	0.006	-51.8	0.911	-178.1
650	0.947	176.0	0.505	22.2	0.006	-59.2	0.913	-178.6
700	0.949	175.5	0.444	20.9	0.005	-52.6	0.922	-179.3
750	0.949	175.1	0.380	17.8	0.005	-58.1	0.923	-179.8
800	0.951	174.4	0.347	14.6	0.003	-50.6	0.929	179.9
850	0.955	174.0	0.314	15.7	0.003	-51.6	0.934	179.1
900	0.956	173.7	0.283	11.8	0.003	-80.2	0.934	179.0
950	0.953	173.1	0.252	11.8	0.002	-53.3	0.939	178.1
1000	0.955	172.8	0.234	7.8	0.003	-67.0	0.943	178.0
1050	0.956	172.5	0.212	8.5	0.002	-30.6	0.940	177.8
1100	0.955	172.1	0.187	4.0	0.001	15.8	0.943	177.2

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.