



RD07MVS1B

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

RD07MVS1B is a MOS FET type transistor specifically designed for VHF/UHF RF power amplifiers applications.
RD07MVS1B improved a drain surge than RD07MVS1 by optimizing MOSFET structure.

High power gain:
 $P_{out} > 7W$, $G_p > 10dB$
 @ $V_{dd} = 7.2V$, $f = 520MHz$
 High Efficiency: 60%typ. (175MHz)
 High Efficiency: 55%typ. (520MHz)

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

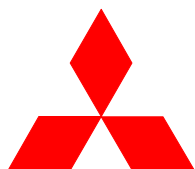
The drawing shows three views of the MOSFET package:

- Top View:** A rectangle with a width of 6.0 ± 0.15 mm and a height of 4.9 ± 0.15 mm. A dashed red line indicates the center. A circle in the bottom-left corner is labeled "INDEX MARK (Gate)".
- Side View:** A narrow profile with a maximum height of 0.2 ± 0.05 mm.
- Front View:** Shows the package with three terminals labeled 1, 2, and 3. The total width is 4.6 ± 0.05 mm. The distance between the center of terminals 1 and 2 is 3.3 ± 0.05 mm, and between 2 and 3 is 0.8 ± 0.05 mm. The distance from the center to the left edge is 1.0 ± 0.05 mm. The distance from the center to the right edge is 2.0 ± 0.05 mm. The total height is 3.5 ± 0.05 mm. The distance from the center to the bottom edge is 0.25 mm. The distance from the center to the top edge is 0.25 mm.

Terminal No.
 1. Drain (output)
 2. Source (GND)
 3. Gate (input)

Note
 (): center value
 UNIT:mm

RD07MVS1B-101, T112 is a RoHS compliant product.
RoHS compliance is indicating by the letter “G” after the Lot Marking.
This product includes the lead in high melting temperature type solders.
However, it is applicable to the following exceptions of RoHS Directions.
1. Lead in high melting temperature type solders (i.e. tin-lead solder alloys containing more than 85% lead.)



ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

MITSUBISHI RF POWER MOS FET

RD07MVS1B

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

ABSOLUTE MAXIMUM RATINGS

(Tc=25°C UNLESS OTHERWISE NOTED)

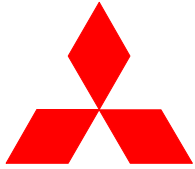
SYMBOL	PARAMETER	CONDITIONS	RATINGS	UNIT
VDSS	Drain to source voltage	Vgs=0V	30	V
VGSS	Gate to source voltage	Vds=0V	+/- 20	V
Pch	Channel dissipation	Tc=25°C	50	W
Pin	Input Power	Zg=Zl=50Ω	1.5	W
ID	Drain Current	-	3	A
Tch	Junction Temperature	-	150	°C
Tstg	Storage temperature	-	-40 to +125	°C
Rth j-c	Thermal resistance	Junction to case	2.5	°C/W

Note: Above parameters are guaranteed independently.

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

SYMBOL	PARAMETER	CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX.	
Idss	Drain cutoff current	VDS=17V, VGS=0V	-	-	200	μA
Igss	Gate cutoff current	VGS=10V, VDS=0V	-	-	1	μA
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.

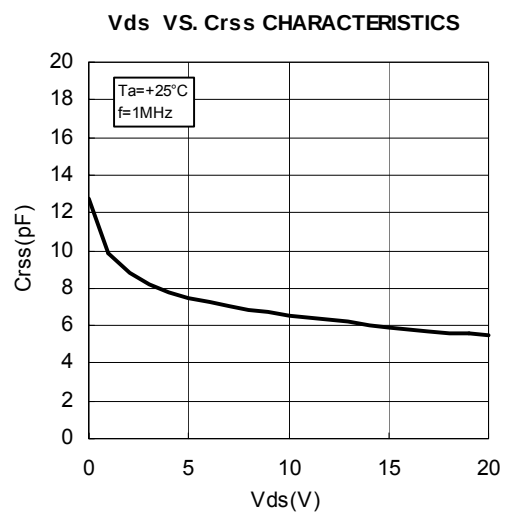
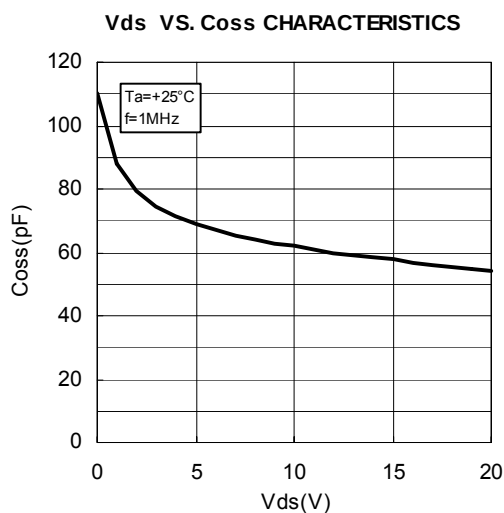
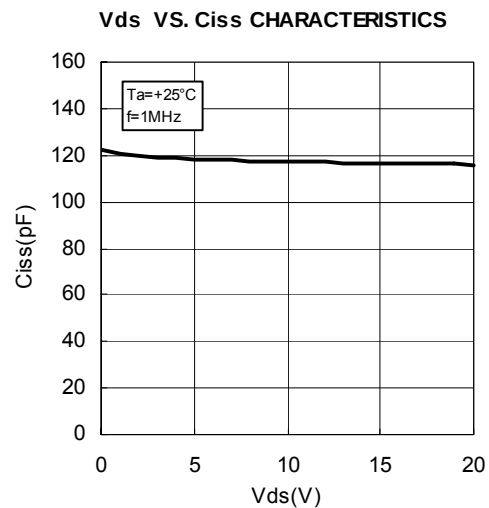
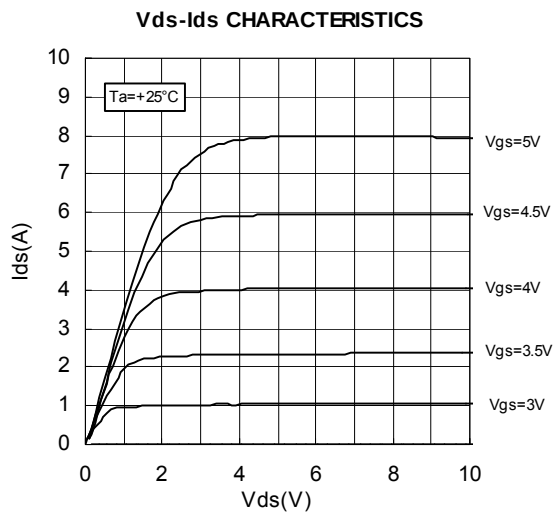
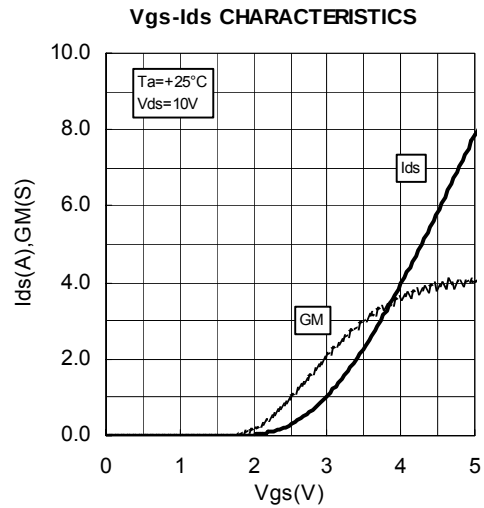
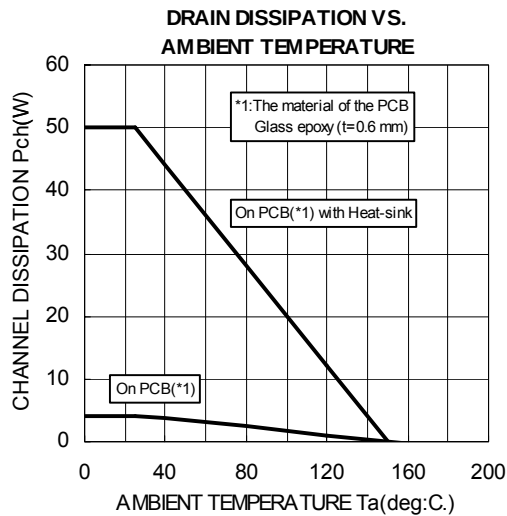


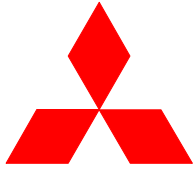
ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

MITSUBISHI RF POWER MOS FET RD07MVS1B

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

TYPICAL CHARACTERISTICS





ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

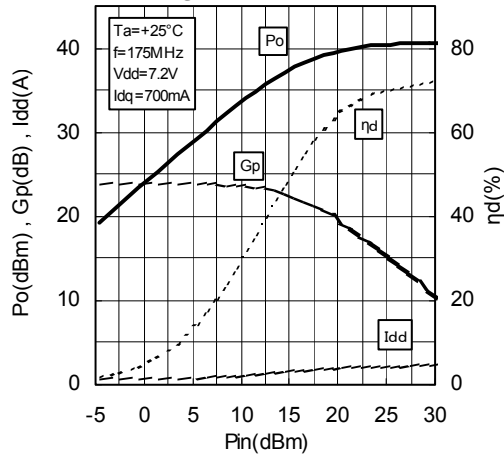
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TYPICAL CHARACTERISTICS

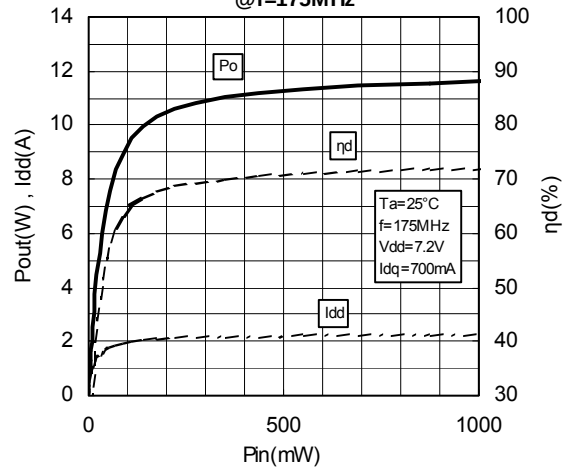
Pin-Po CHARACTERISTICS

@f=175MHz



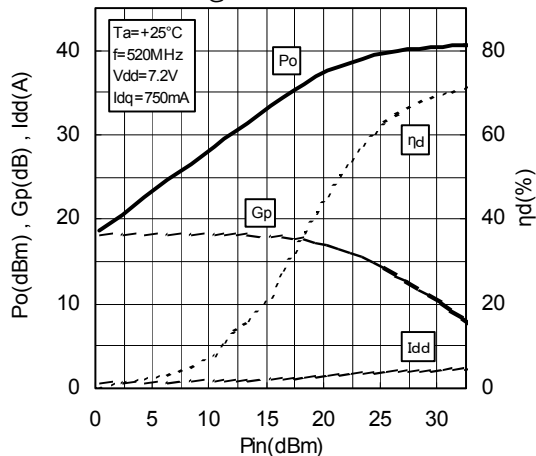
Pin-Po CHARACTERISTICS

@f=175MHz



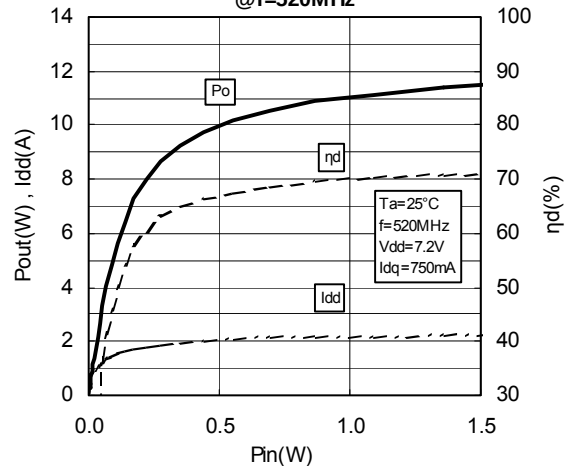
Pin-Po CHARACTERISTICS

@f=520MHz



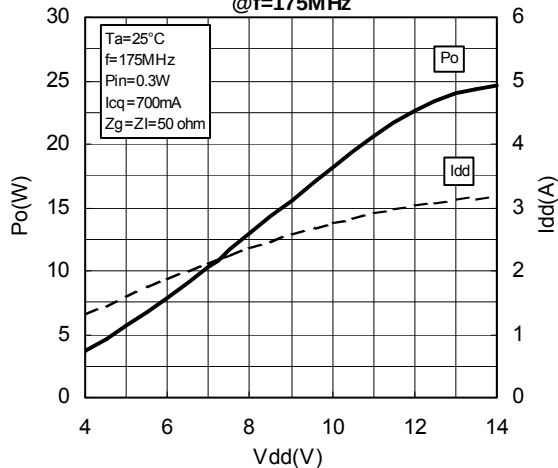
Pin-Po CHARACTERISTICS

@f=520MHz



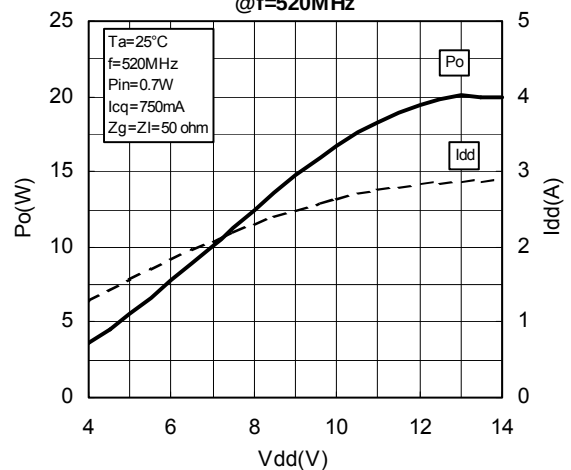
Vdd-Po CHARACTERISTICS

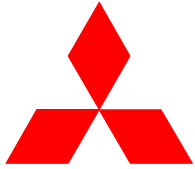
@f=175MHz



Vdd-Po CHARACTERISTICS

@f=520MHz



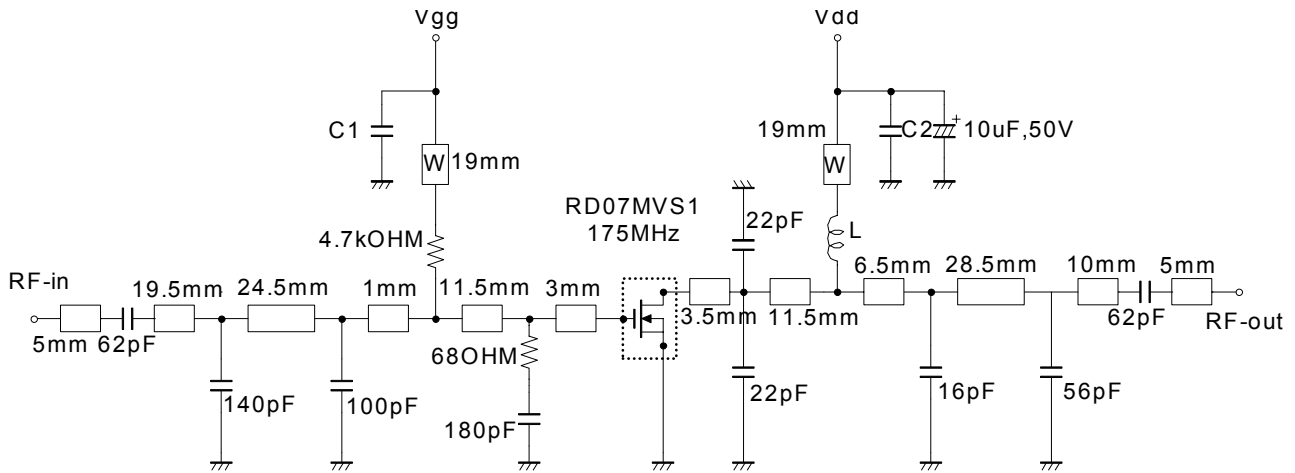


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MITSUBISHI RF POWER MOS FET RD07MVS1B

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

TEST CIRCUIT(f=175MHz)



L: Enameled wire 7Turns, D:0.43mm, 2.46mm O.D

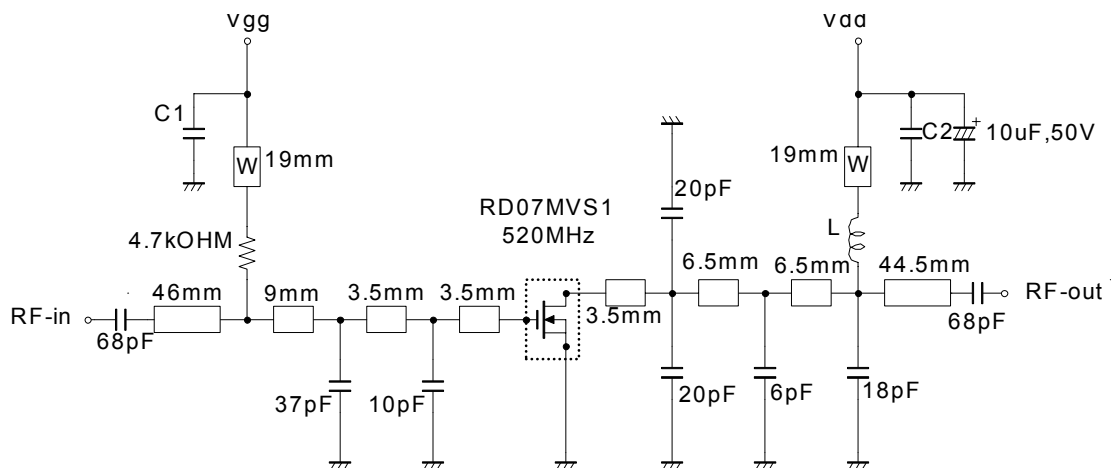
C1, C2: 1000pF, 0.022uF in parallel

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)



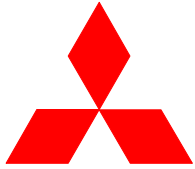
L: Enameled wire 5Turns, D:0.43mm, 2.46mm O.D

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



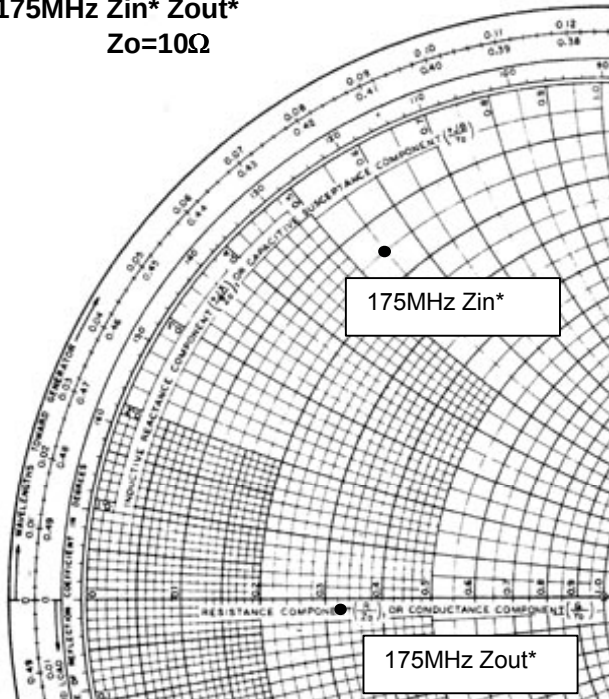
ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

MITSUBISHI RF POWER MOS FET RD07MVS1B

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

INPUT/OUTPUT IMPEDANCE VS. FREQUENCY CHARACTERISTICS

175MHz Z_{in}^* Z_{out}^*
 $Z_o=10\Omega$

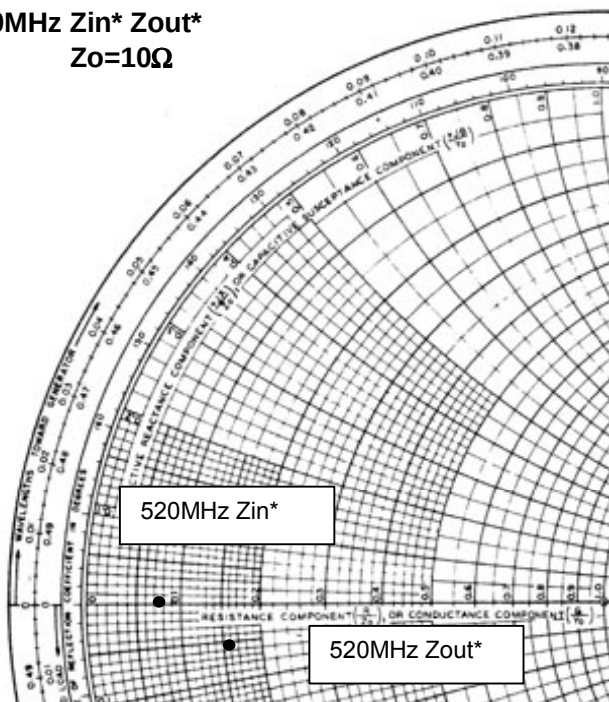


$V_{dd}=7.2V$, $I_{dq}=700mA$ (V_{gg} adj.), $P_{in}=0.28W$

$Z_{in}^*=1.55+j5.53$
 $Z_{out}^*=3.24-j0.26$

Z_{in}^* : Complex conjugate of input impedance
 Z_{out}^* : Complex conjugate of output impedance

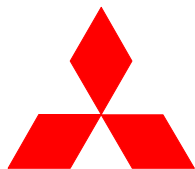
520MHz Z_{in}^* Z_{out}^*
 $Z_o=10\Omega$



$V_{dd}=7.2V$, $I_{dq}=750mA$ (V_{gg} adj.), $P_{in}=0.7W$

$Z_{in}^*=0.76+j0.06$
 $Z_{out}^*=1.61-j0.52$

Z_{in}^* : Complex conjugate of input impedance
 Z_{out}^* : Complex conjugate of output impedance



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RD07MVS1B

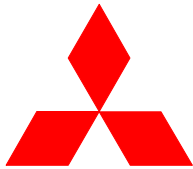
RoHS Compliance, Silicon MOSFET Power Transistor, 175MHz, 520MHz, 7W

RD07MVS1B S-PARAMETER DATA (@V_{dd}=7.2V, I_d=750mA)

Freq. [MHz]	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
100	0.881	-174.0	6.055	75.9	0.018	-14.2	0.767	-170.7
135	0.885	-175.5	4.358	68.8	0.017	-20.6	0.773	-172.2
150	0.888	-176.0	3.844	66.2	0.017	-23.4	0.774	-172.4
175	0.891	-176.6	3.207	62.8	0.016	-26.8	0.788	-172.4
200	0.896	-177.1	2.749	59.3	0.016	-29.8	0.810	-172.4
250	0.904	-178.0	2.069	51.8	0.015	-36.7	0.829	-173.0
300	0.914	-178.8	1.602	46.2	0.013	-42.2	0.842	-173.6
350	0.922	-179.7	1.288	40.5	0.012	-47.7	0.871	-174.6
400	0.929	-179.6	1.043	35.7	0.011	-52.2	0.878	-175.3
450	0.934	-178.8	0.864	31.8	0.009	-55.2	0.895	-176.3
500	0.939	-178.0	0.724	27.7	0.008	-57.6	0.907	-177.1
520	0.941	-177.8	0.678	26.4	0.008	-57.8	0.907	-177.4
527	0.941	-177.7	0.660	26.0	0.007	-59.8	0.908	-177.4
550	0.944	-177.4	0.616	24.7	0.007	-61.0	0.910	-177.8
600	0.947	-176.7	0.529	21.7	0.006	-62.4	0.925	-178.8
650	0.950	-176.1	0.458	19.1	0.005	-63.3	0.925	-179.3
700	0.953	-175.5	0.401	16.8	0.005	-63.4	0.933	-180.0
750	0.953	-174.9	0.351	14.4	0.004	-63.4	0.939	-179.4
800	0.956	-174.5	0.314	12.6	0.003	-61.4	0.940	-179.1
850	0.955	-174.1	0.279	10.9	0.003	-59.7	0.944	-178.3
900	0.958	-173.6	0.250	9.1	0.002	-59.3	0.948	-178.3
950	0.959	-173.4	0.225	8.1	0.002	-54.8	0.947	-177.7
1000	0.959	-172.9	0.204	6.3	0.001	-47.5	0.952	-177.2
1050	0.959	-172.7	0.186	5.3	0.001	-34.8	0.951	-177.2
1100	0.959	-172.5	0.170	3.9	0.001	-14.2	0.952	-176.5

RD07MVS1B S-PARAMETER DATA (@V_{dd}=12.5V, I_d=750mA)

Freq. [MHz]	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
100	0.880	-172.4	6.708	75.3	0.018	-13.9	0.726	-168.1
135	0.884	-174.2	4.812	67.7	0.017	-21.0	0.737	-169.4
150	0.886	-174.9	4.237	64.9	0.017	-23.8	0.742	-169.7
175	0.891	-175.5	3.523	61.2	0.016	-26.9	0.759	-169.7
200	0.897	-176.1	3.008	57.5	0.016	-30.8	0.784	-169.7
250	0.907	-177.2	2.249	49.7	0.014	-38.8	0.810	-170.5
300	0.916	-178.1	1.729	43.9	0.013	-43.0	0.829	-171.4
350	0.926	-179.2	1.383	38.2	0.012	-49.1	0.861	-172.5
400	0.932	-179.9	1.114	33.3	0.010	-54.0	0.870	-173.4
450	0.938	-179.1	0.918	29.3	0.009	-57.3	0.889	-174.6
500	0.943	-178.3	0.769	25.4	0.008	-61.1	0.903	-175.7
520	0.944	-178.0	0.716	24.0	0.007	-61.2	0.904	-176.0
527	0.944	-177.9	0.698	23.6	0.007	-62.3	0.905	-176.0
550	0.946	-177.5	0.651	22.3	0.007	-63.6	0.907	-176.5
600	0.950	-176.8	0.557	19.3	0.006	-63.7	0.921	-177.6
650	0.952	-176.3	0.480	16.7	0.005	-66.5	0.923	-178.1
700	0.954	-175.5	0.420	14.5	0.004	-64.0	0.932	-179.0
750	0.955	-175.0	0.368	12.1	0.004	-65.9	0.937	-179.7
800	0.957	-174.6	0.326	10.3	0.003	-66.5	0.937	-179.9
850	0.956	-174.1	0.291	8.8	0.002	-62.7	0.943	-179.2
900	0.958	-173.7	0.260	7.0	0.002	-64.3	0.946	-179.0
950	0.958	-173.4	0.235	5.7	0.001	-62.3	0.947	-178.5
1000	0.959	-173.0	0.212	4.1	0.001	-54.8	0.952	-177.9
1050	0.960	-172.6	0.193	3.2	0.001	-27.4	0.950	-178.0
1100	0.959	-172.4	0.177	1.9	0.000	10.8	0.950	-177.1



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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.

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.