



# SPM3212

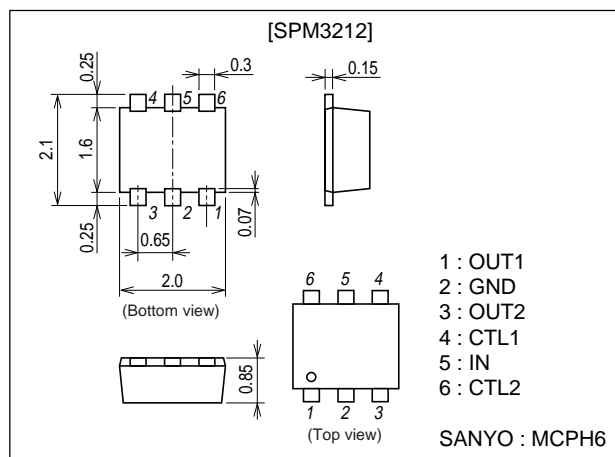
## Wide-band Switch MMIC Operating with Single Power Supply

### Features

- Control voltage : +3 / 0V.
- Small package (MCPH6).
- High isolation.
- Low Insertion loss.
- High surge breakdown voltage.

### Package Dimensions

unit : mm  
1323



### Specifications

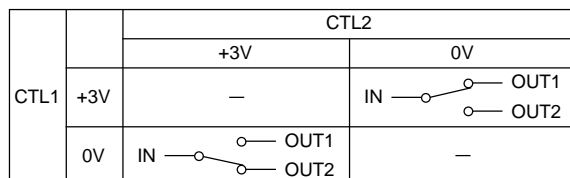
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Control Voltage	V <sub>CTL</sub>		5.0	V
Power Dissipation	P <sub>D</sub>		150	mW
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C
Operating Temperature	T <sub>opr</sub>		-40 to +85	°C

Electrical Characteristics at Ta=25°C Control Voltage 1, 2 : 0 / +3V

Parameter	Conditions	Ratings			Unit
		min	typ	max	
Insertion Loss	IN-OUT1, IN-OUT2	f=1GHz	0.45	0.75	dB
		f=2GHz	0.5	0.8	dB
		f=2.5GHz	0.55	0.85	dB
Isolation	IN-OUT1, IN-OUT2	f=1GHz	19	22	dB
		f=2GHz	15	18	dB
		f=2.5GHz	13	16	dB

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Marking : RE

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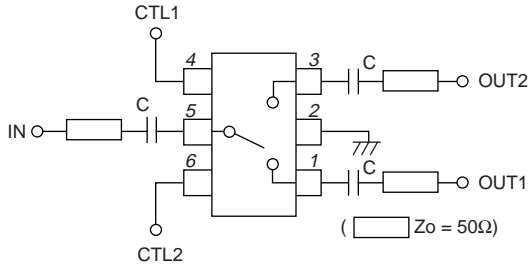
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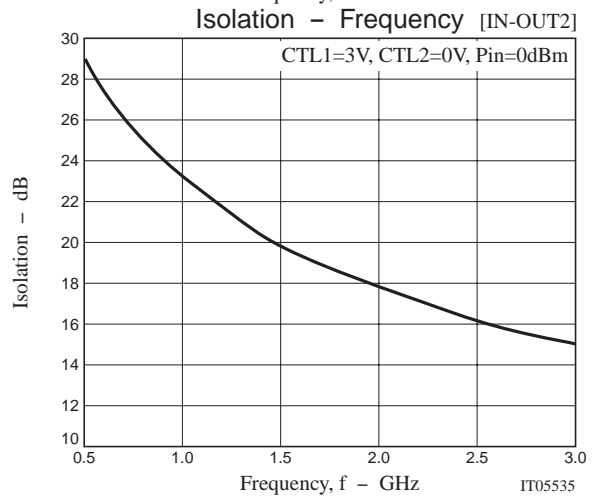
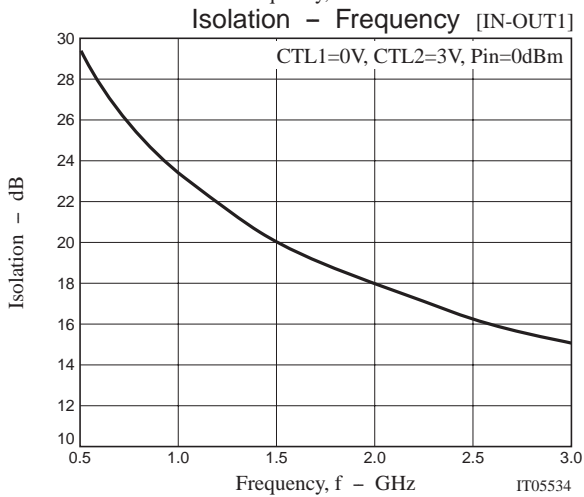
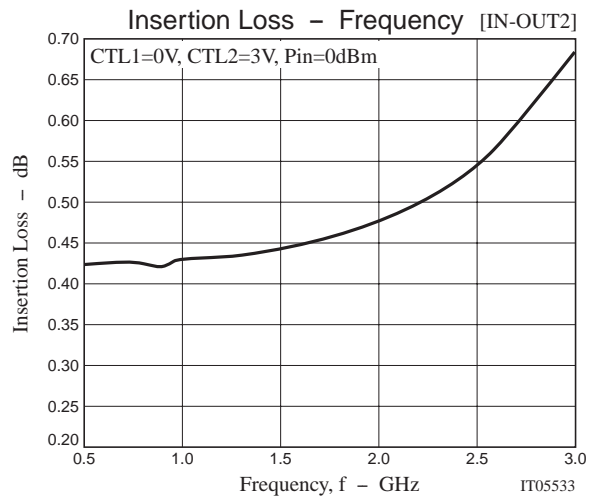
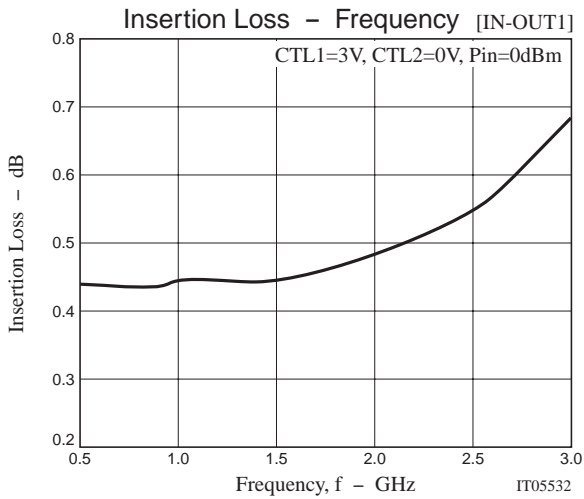
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Parameter	Conditions	Ratings			Unit
		min	typ	max	
VSWR	IN-OUT1, IN-OUT2	f=1GHz to 2.5GHz			
Switching Time		f=1GHz to 2.5GHz			ns
P <sub>IN</sub> 1dB	IN-OUT1, IN-OUT2	24	28		dBm

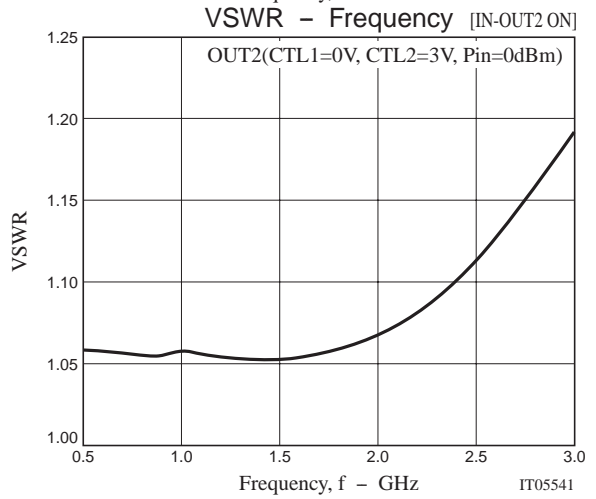
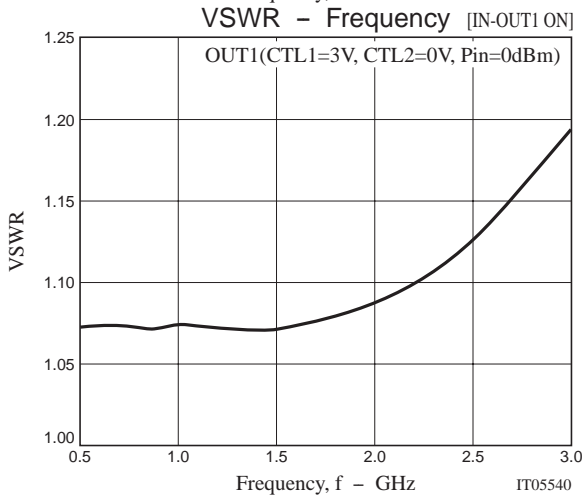
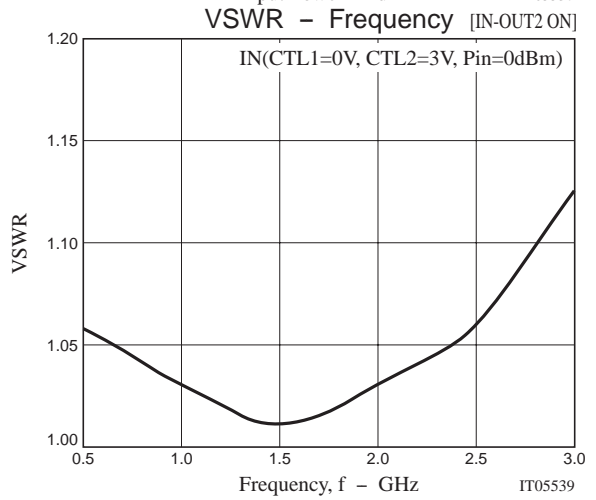
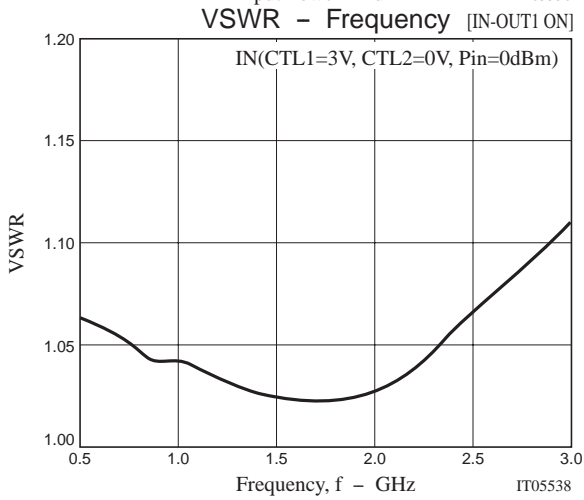
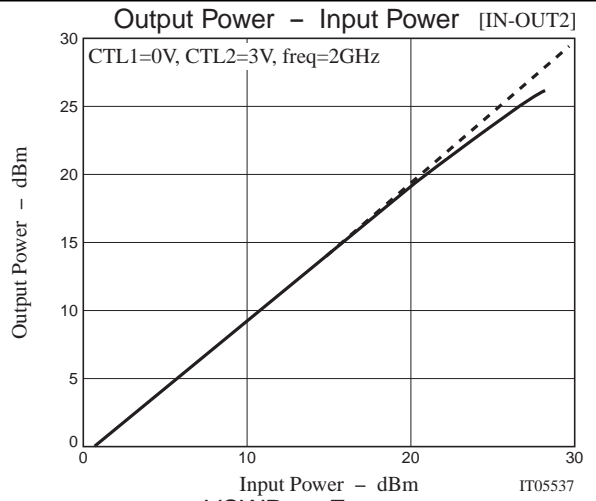
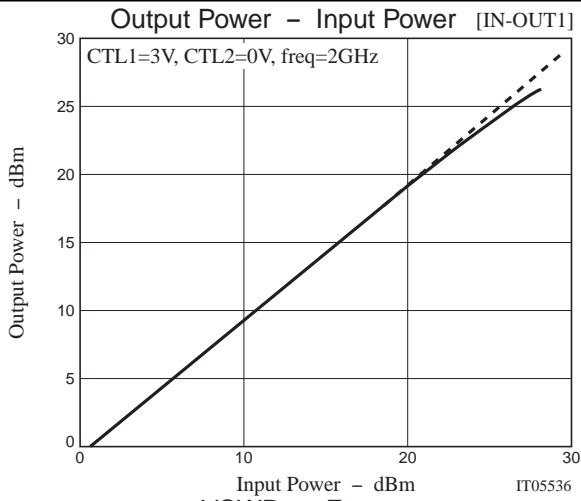
## Application Circuit



C : at 0.8 to 1.5GHz 33pF  
at 1.9 to 2.5GHz 10pF



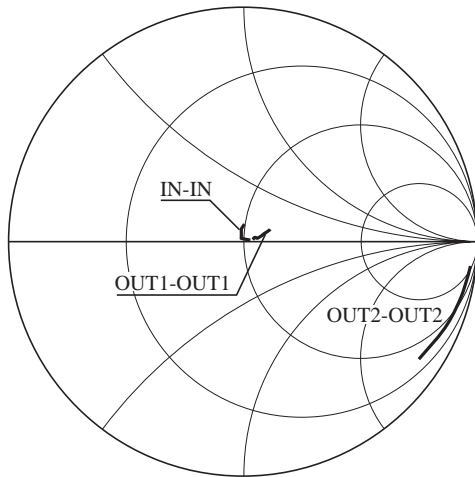
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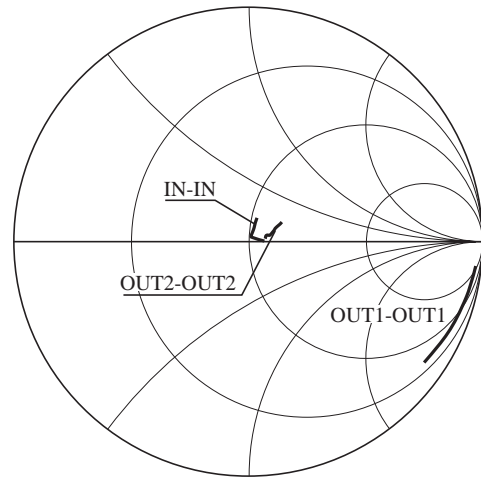
## S-parameter

(CTL1=3V, CTL2=0V, Pin=0dBm, f=0.5 to 3GHz)



## S-parameter

(CTL1=0V, CTL2=3V, Pin=0dBm, f=0.5 to 3GHz)



## IN-OUT1 ON

(CTL1=3V, CTL2=0V, 0dBm)

Frequency (GHz)	IN-IN		IN-OUT2		IN-OUT1		OUT2-IN		OUT2-OUT2		OUT2-OUT1		OUT1-IN		OUT1-OUT2		OUT1-OUT1	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.5	0.027	-2.1	0.036	69.2	0.945	-3.2	0.036	74.5	0.970	-6.2	0.034	75.5	0.947	-3.3	0.033	72.7	0.028	10.7
0.6	0.025	-1.9	0.043	69.6	0.945	-3.8	0.043	75.4	0.966	-7.4	0.040	76.2	0.944	-3.8	0.040	72.4	0.029	11.1
0.7	0.022	-2.0	0.049	72.4	0.942	-4.4	0.050	75.5	0.966	-8.7	0.047	76.4	0.943	-4.4	0.046	75.4	0.027	14.3
0.8	0.019	-2.0	0.056	70.9	0.940	-5.0	0.057	75.9	0.961	-9.8	0.053	77.6	0.941	-4.9	0.052	74.9	0.027	14.9
0.9	0.015	-1.5	0.062	73.2	0.937	-5.6	0.063	75.5	0.962	-11.2	0.059	77.3	0.939	-5.5	0.058	76.1	0.026	15.3
1.0	0.013	2.7	0.068	73.9	0.936	-6.1	0.069	75.0	0.961	-12.3	0.066	77.2	0.938	-6.0	0.065	76.8	0.027	16.4
1.1	0.010	4.8	0.075	72.2	0.933	-6.6	0.076	75.5	0.955	-13.7	0.071	78.3	0.934	-6.7	0.071	76.0	0.025	14.6
1.2	0.007	17.5	0.082	73.8	0.932	-7.2	0.082	74.6	0.957	-14.8	0.078	76.6	0.932	-7.2	0.077	77.1	0.026	17.4
1.3	0.005	52.0	0.088	71.9	0.931	-7.8	0.089	74.6	0.951	-16.2	0.085	78.0	0.929	-7.7	0.082	76.0	0.025	14.9
1.4	0.004	73.4	0.094	73.2	0.929	-8.3	0.094	73.9	0.952	-17.3	0.088	76.7	0.929	-8.2	0.089	76.7	0.026	17.1
1.5	0.004	108.1	0.100	73.2	0.926	-8.9	0.102	73.6	0.951	-18.8	0.097	76.7	0.927	-8.8	0.096	77.1	0.025	12.3
1.6	0.006	119.2	0.106	72.3	0.923	-9.3	0.106	72.9	0.946	-19.9	0.100	76.9	0.925	-9.4	0.100	77.1	0.027	13.1
1.7	0.009	128.8	0.112	72.2	0.921	-10.0	0.115	72.6	0.946	-21.3	0.109	76.1	0.924	-9.9	0.106	76.3	0.027	9.2
1.8	0.011	135.0	0.117	70.4	0.919	-10.5	0.118	72.3	0.937	-22.3	0.112	76.3	0.920	-10.4	0.112	74.5	0.029	10.5
1.9	0.013	132.9	0.124	70.1	0.917	-11.1	0.127	71.8	0.936	-23.6	0.120	75.7	0.919	-11.0	0.119	74.5	0.030	6.4
2.0	0.015	135.5	0.128	69.1	0.915	-11.6	0.128	71.8	0.931	-24.7	0.122	76.1	0.916	-11.6	0.121	74.3	0.032	7.3
2.1	0.017	130.5	0.134	69.7	0.912	-12.1	0.137	69.4	0.936	-25.8	0.132	74.2	0.914	-12.2	0.128	74.7	0.036	6.2
2.2	0.019	128.0	0.139	68.7	0.911	-12.8	0.142	70.4	0.931	-27.0	0.137	75.8	0.911	-12.7	0.134	74.0	0.037	8.6
2.3	0.022	121.6	0.145	69.4	0.908	-13.3	0.148	69.7	0.931	-27.9	0.141	73.6	0.909	-13.3	0.140	73.9	0.042	8.9
2.4	0.024	116.6	0.149	69.0	0.904	-13.9	0.153	69.8	0.930	-29.0	0.148	74.6	0.906	-13.8	0.144	74.6	0.045	11.6
2.5	0.028	108.6	0.155	69.2	0.903	-14.5	0.156	70.2	0.927	-29.7	0.148	75.5	0.904	-14.4	0.147	74.9	0.052	10.8
2.6	0.032	104.0	0.158	68.7	0.899	-15.0	0.160	67.1	0.928	-30.8	0.156	72.3	0.900	-15.0	0.154	73.8	0.057	16.0
2.7	0.037	98.7	0.166	67.9	0.897	-15.6	0.172	69.0	0.922	-31.4	0.166	75.4	0.899	-15.6	0.162	74.4	0.064	16.3
2.8	0.042	92.2	0.168	67.7	0.896	-16.3	0.167	67.9	0.919	-32.3	0.160	72.6	0.895	-16.3	0.160	73.3	0.071	19.7
2.9	0.049	86.3	0.174	66.6	0.891	-16.9	0.183	67.5	0.915	-32.8	0.177	74.5	0.892	-16.9	0.168	73.7	0.079	20.9
3.0	0.057	81.3	0.200	66.2	0.888	-17.7	0.176	69.1	0.905	-33.6	0.169	75.6	0.887	-17.6	0.169	72.6	0.087	22.9

\*The characteristic contains evaluation system loss.

## IN-OUT2 ON

(CTL1=0V, CTL2=3V, 0dBm)

Frequency (GHz)	IN-IN		IN-OUT2		IN-OUT1		OUT2-IN		OUT2-OUT2		OUT2-OUT1		OUT1-IN		OUT1-OUT2		OUT1-OUT1	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.5	0.031	2.4	0.952	-3.2	0.034	76.1	0.952	-3.2	0.034	11.7	0.032	79.4	0.035	87.6	0.033	89.0	0.976	-6.4
0.6	0.029	7.0	0.950	-3.8	0.042	78.4	0.951	-3.8	0.035	11.5	0.039	81.2	0.041	86.2	0.038	87.5	0.976	-7.7
0.7	0.025	3.6	0.948	-4.4	0.048	80.2	0.949	-4.4	0.035	12.3	0.045	82.8	0.048	85.4	0.046	86.7	0.974	-8.9
0.8	0.025	9.2	0.947	-5.0	0.055	80.2	0.947	-5.0	0.034	14.3	0.052	82.8	0.054	85.0	0.051	86.7	0.972	-10.2
0.9	0.019	9.2	0.945	-5.6	0.061	80.4	0.945	-5.6	0.034	12.8	0.057	83.1	0.061	82.3	0.058	84.7	0.968	-11.5
1.0	0.020	13.7	0.943	-6.1	0.068	78.6	0.944	-6.1	0.035	14.6	0.064	81.2	0.068	83.2	0.064	85.4	0.964	-12.7
1.1	0.015	23.0	0.941	-6.7	0.074	79.5	0.942	-6.7	0.034	12.4	0.070	82.6	0.073	81.9	0.070	84.0	0.962	-14.0
1.2	0.015	22.3	0.939	-7.3	0.080	77.3	0.940	-7.2	0.035	16.0	0.075	80.1	0.080	81.8	0.077	84.0	0.955	-15.2
1.3	0.013	39.9	0.938	-7.8	0.088	77.5	0.938	-7.8	0.033	11.5	0.083	81.0	0.085	80.4	0.082	83.6	0.953	-16.4
1.4	0.011	39.1	0.935	-8.3	0.092	77.8	0.936	-8.3	0.036	16.4	0.087	81.2	0.093	78.8	0.089	82.1	0.952	-17.8
1.5	0.011	49.6	0.934	-9.0	0.100	76.8	0.934	-8.9	0.034	10.8	0.095	80.3	0.100	80.0	0.095	82.8	0.952	-19.0
1.6	0.009	64.0	0.932	-9.5	0.105	77.1	0.932	-9.5	0.036	14.4	0.100	81.0	0.103	77.6	0.099	81.0	0.948	-20.2
1.7	0.010	66.8	0.930	-10.1	0.111	74.5	0.931	-10.0	0.035	10.2	0.106	78.5	0.112	78.1	0.108	81.8	0.944	-21.4
1.8	0.010	86.3	0.928	-10.7	0.117	75.4	0.928	-10.6	0.038	12.4	0.112	79.4	0.115	76.2	0.110	80.1	0.942	-22.7
1.9	0.011	75.5	0.925	-11.2	0.122	74.9	0.927	-11.2	0.038	10.1	0.116	79.0	0.128	76.5	0.122	80.2	0.943	-23.8
2.0	0.013	96.5	0.924	-11.8	0.128	74.2	0.924	-11.7	0.041	11.0	0.122	78.4	0.125	76.4	0.121	80.1	0.941	-25.1
2.1	0.013	85.7	0.922	-12.4	0.133	73.5	0.923	-12.3	0.043	11.3	0.128	78.4	0.134	73.3	0.130	78.1	0.941	-26.1
2.2	0.017	90.9	0.920	-13.0	0.140	72.7	0.920	-12.9	0.045	12.5	0.134	77.4	0.138	74.4	0.133	79.1	0.937	-27.2
2.3	0.017	87.7	0.917	-13.6	0.145	72.9	0.918	-13.5	0.050	13.6	0.139	77.3	0.146	73.4	0.140	77.5	0.936	-28.2
2.4	0.022	83.4	0.915	-14.2	0.149	71.7	0.916	-14.0	0.051	15.3	0.144	76.5	0.149	75.1	0.144	79.1	0.935	-29.1
2.5	0.024	84.5	0.911	-14.8	0.155	71.5	0.912	-14.7	0.058	16.6	0.150	77.3	0.153	73.7	0.150	79.3	0.931	-29.9
2.6	0.028	75.4	0.911	-15.4	0.158	70.6	0.912	-15.4	0.061	19.2	0.152	76.4	0.158	71.5	0.153	77.4	0.929	-30.8
2.7	0.033	76.7	0.906	-15.9	0.167	71.6	0.907	-15.7	0.069	20.5	0.163	77.3	0.169	72.2	0.164	77.6	0.932	-31.5
2.8	0.038	70.3	0.906	-16.7	0.168	71.1	0.905	-16.7	0.073	23.1	0.159	76.3	0.166	71.7	0.159	76.5	0.927	-32.3
2.9	0.046	69.5	0.901	-17.2	0.176	70.1	0.903	-17.0	0.082	24.6	0.170	76.2	0.175	71.5	0.170	77.2	0.927	-32.9
3.0	0.051	65.7	0.900	-18.1	0.177	69.8	0.897	-18.0	0.087	26.9	0.170	76.9	0.175	72.0	0.170	79.1	0.919	-33.4

\*The characteristic contains evaluation system loss.

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