RoHS

LDMOS RF Power Transistor

HTL7G06S006P

100-600MHz, 6W, 7.2V
WIDE BAND
RF POWER LDMOS TRANSISTOR

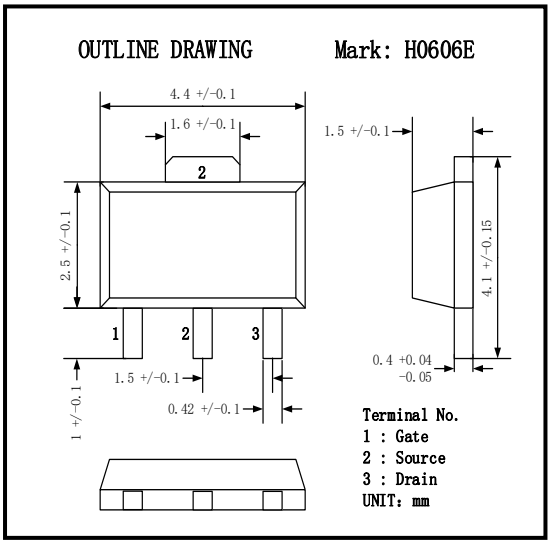
1. Description

HTL7G06S006P is a MOSFET type transistor specifically designed for VHF/UHF RF Power Amplifier applications.
This device has an internal monolithic Zener diode from gate to source for ESD protection.

2. Features

Frequency (MHz)	VDD (V)	Pin (W)	Pout (W)	Eff (%)
175(1)	7.4	0.32	6.5	66
520(2)	7.4	0.32	5.5	61

1. Measured in 175MHz narrowband reference circuit.
2. Measured in 520MHz narrowband reference circuit.



3. Application

- For output stage of high power amplifiers in VHF/UHF Band mobile radio sets.
- For drive stage of high power amplifiers in Universal Broadband.

4. Absolute Maximum Rarings

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Drain to source voltage	V_{DSS}	V_{gs} = 0V	20	V
Gate to source voltage	V_{GSS}	V_{ds} = 0V	-5 ~ 10	V
Operating Voltage	V_{DD}	-	9	V
Storage temperature	T_{stg}	-	-55 ~ 150	℃
Operating Junction Temperature	T_J	-	-40 ~ 150	℃
Thermal resistance	$Z_{th(j-c)}$	Junction to case	6.5	℃/W

5. Electrical Characteristics

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Breakdown Voltage	$V_{(BR)DDS}$	V_{GG} = 0V, I_D = 39.6uA	20	-	-	V
Zero Gate Voltage Drain Leakage Current	I_{DSS}	V_{DD} = 12V, V_{GG} = 0V	1	-	-	uA
Gate-Source Leakage Current	I_{GSS}	V_{DD} = 0V, V_{GG} = 10V	1	-	-	uA
Gate Threshold Voltage	V_{th}	V_{DD} = V_{GG}, Id = 39.6uA	0.8	1.55	2.6	V
Output Power	P_{out}	V_{DD} = 7.4V, P_{in} = 0.31W f = 175MHz, I_{DQ} = 500mA	-	6.5	-	W
Drain Efficiency	η_d		-	66	-	%
Output Power	P_{out}	V_{DD} = 7.4V, P_{in} = 0.31W f = 520MHz, I_{DQ} = 500mA	-	5.5	-	W
Drain Efficiency	η_d		-	61	-	%

6. ESD Protection Characteristics

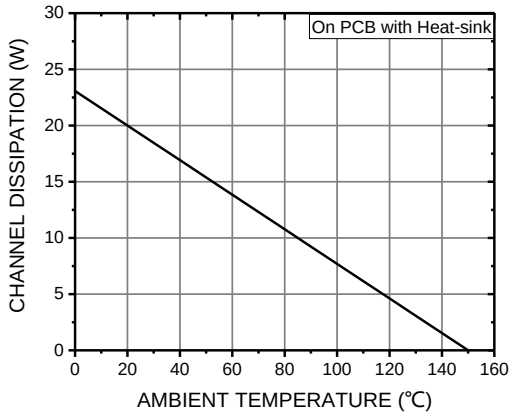
Test Methodology	Class
Human Body Model (per JESD22-A114)	1B
Machine Model (per EIA/JESD22-A115)	A
Charge Device Model (per JESD22-C101)	III

7. Load Mismatch（*in Huatai Test Fixture*）

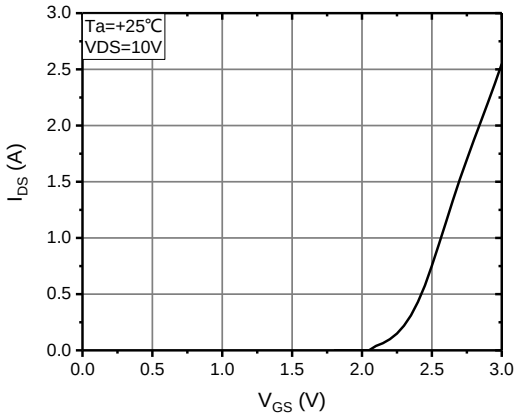
Test Methodology	Results
VSWR = 10:1 at all Phase Angles CW: VDD=8.4Vdc, IDQ=500mA, f=175MHz, Pout =37dBm.	No Device Degradation
VSWR = 10:1 at all Phase Angles CW: VDD=8.4Vdc, IDQ=500mA, f=520MHz, Pout =37dBm.	No Device Degradation

8. Typical Characteristics

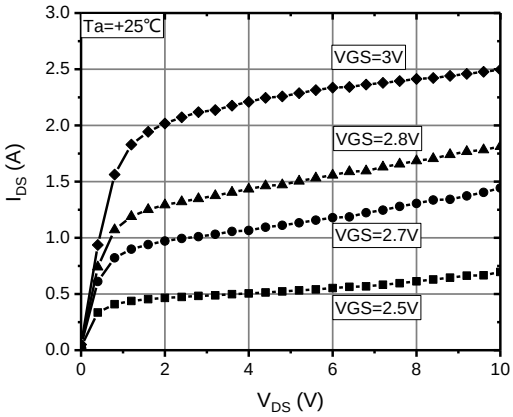
CHANNEL DISSIPATION VS. AMBIENT TEMPERATURE



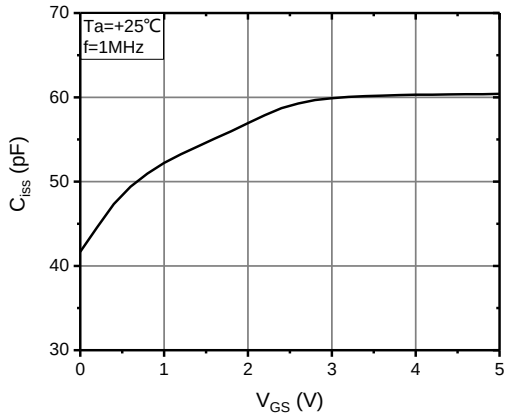
I_{DS} VS. V_{GS}



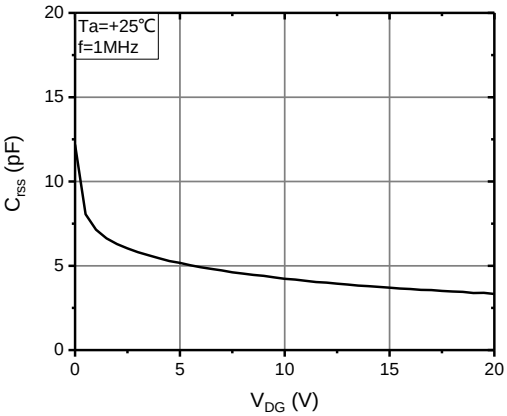
I_{DS} VS. V_{DS}



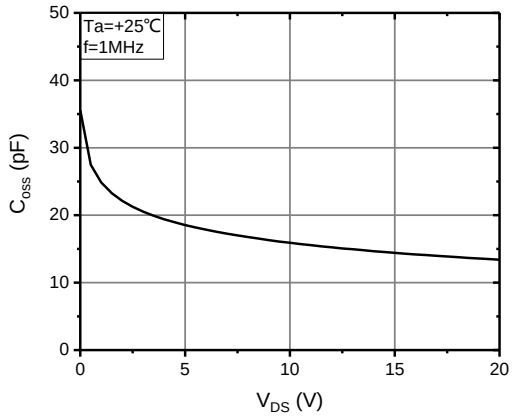
C_{iss} VS.V_{DS}



C_{rss} VS. V_{DS}

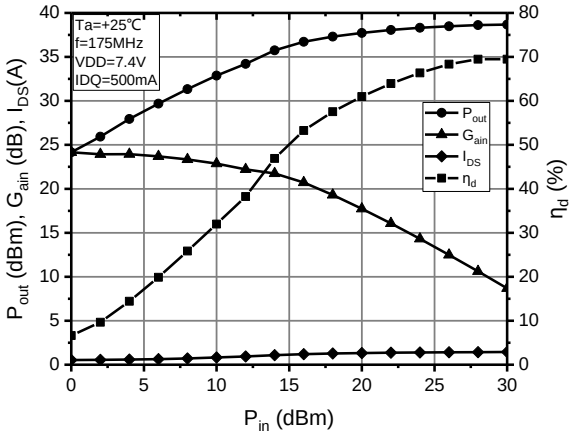


C_{oss} VS. V_{DS}

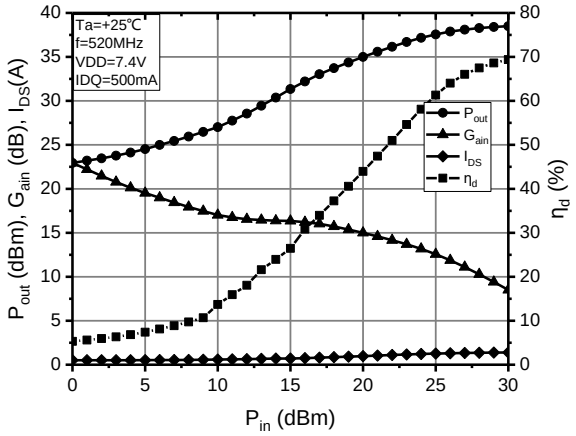


9. Typical Characteristics @V_{DD}=7.4V, VHF/UHF-band

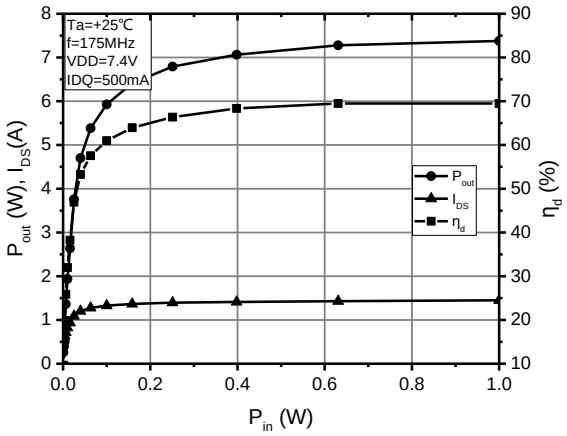
P_{out} VS. P_{in} @ f = 175MHz



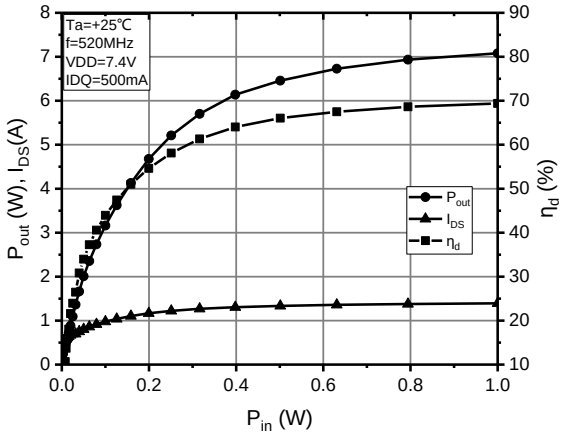
P_{out} VS. P_{in} @ f = 520MHz



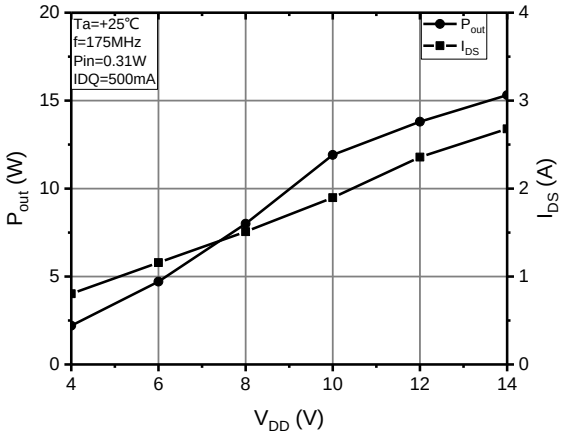
P_{out} VS. Pin @ f = 175MHz



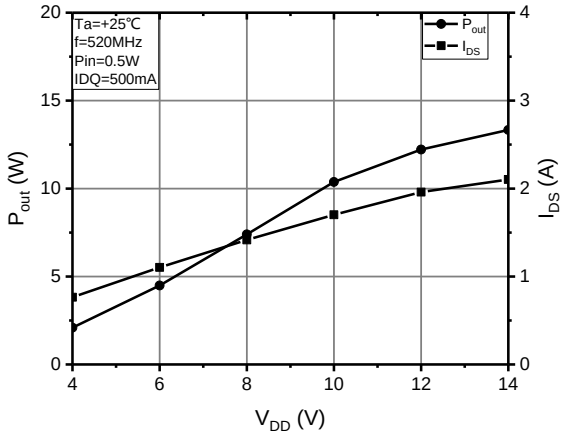
P_{out} VS. P_{in} @ f = 520MHz



P_{out} VS. V_{DD} @ f = 175MHz

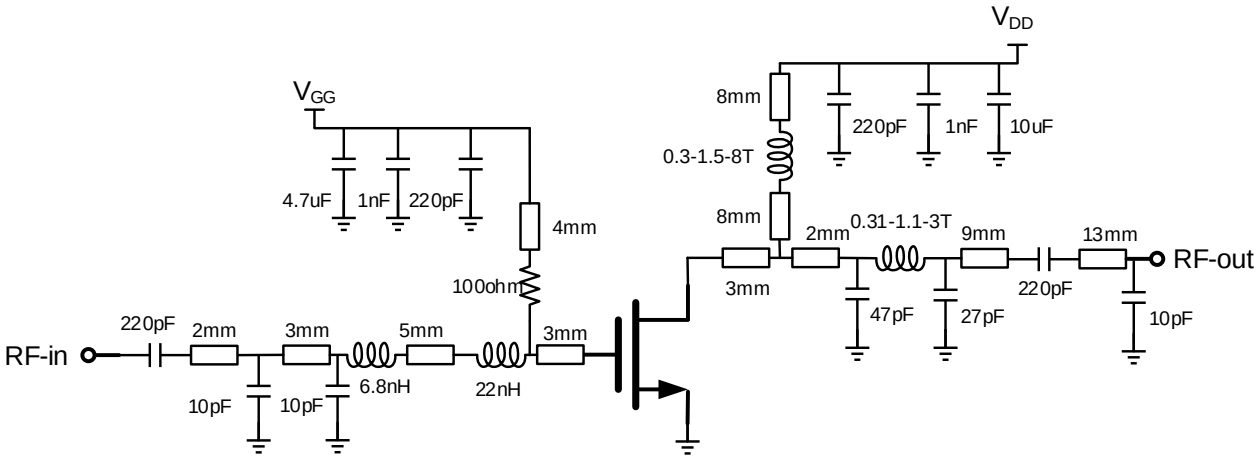


P_{out} VS. V_{DD} @ f = 520MHz



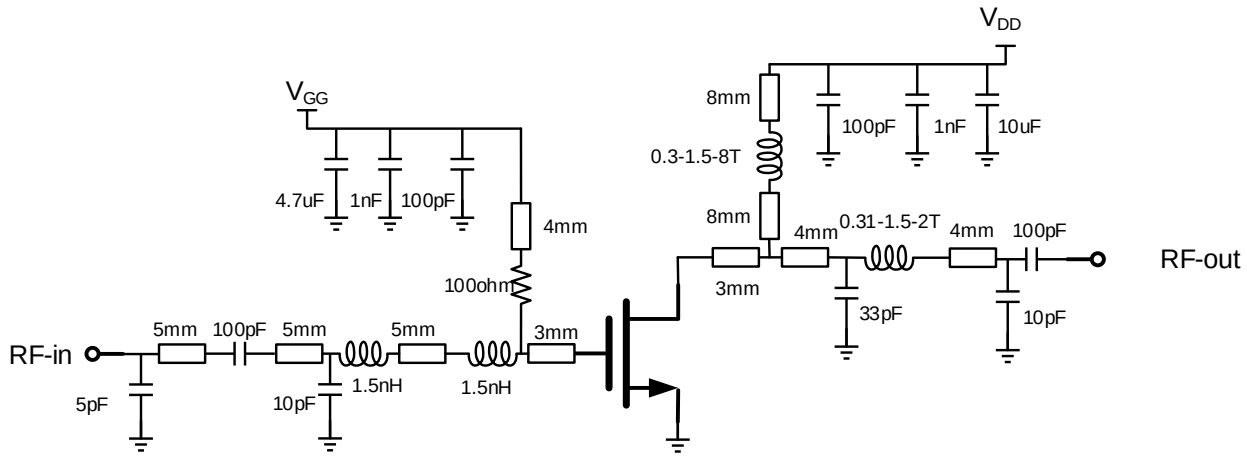
10.Test Circuit @V_{DD}=7.4V, VHF/UHF-band

175MHz @V_{DD} = 7.4V, I_{DQ} = 500mA



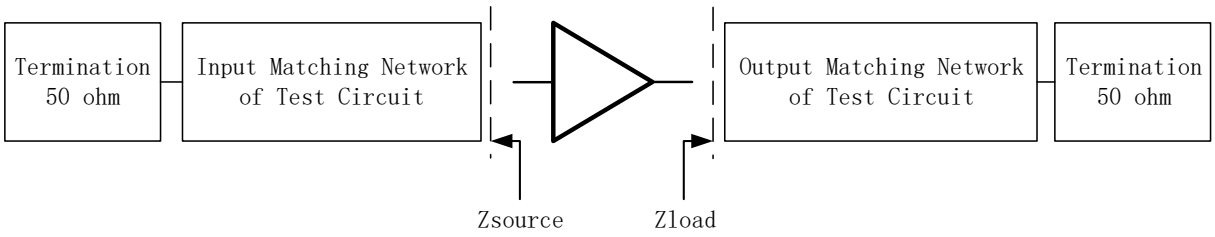
Note: The characteristic impedance of all microstrip lines: 50ohm

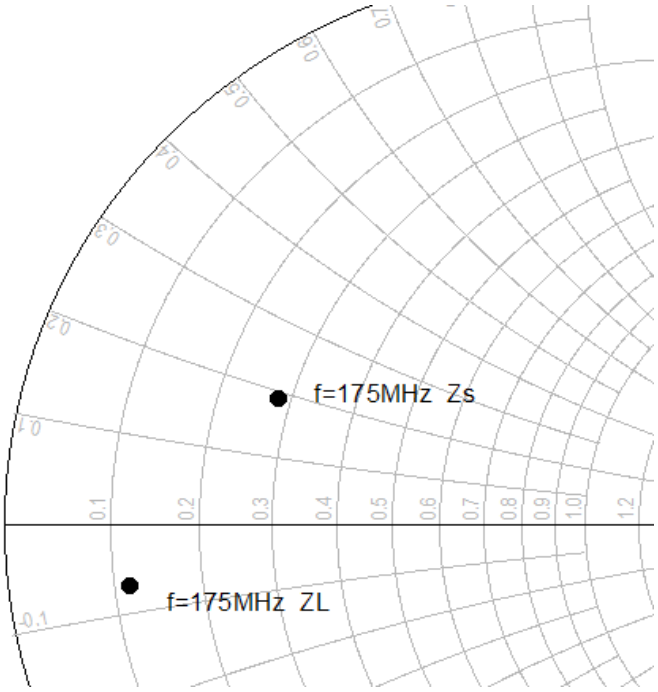
520MHz @V_{DD} = 7.4V, I_{DQ} = 500mA



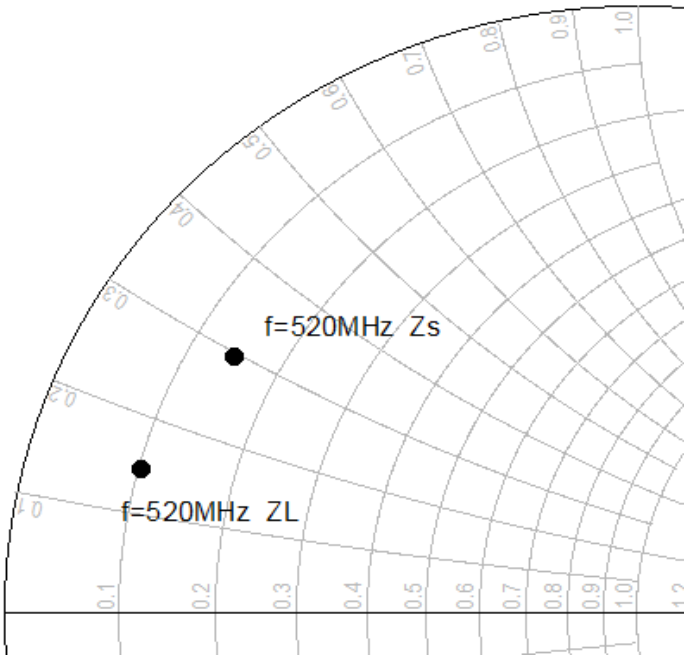
Note: The characteristic impedance of all microstrip lines: 50ohm

11.Input/Output Impedance Characteristics





@P_{in}=0.31W, V_{DS}=7.4V, I_{dq}=500mA	
Z_S	13.90 + j 9.38
Z_L	5.21 – j 3.41

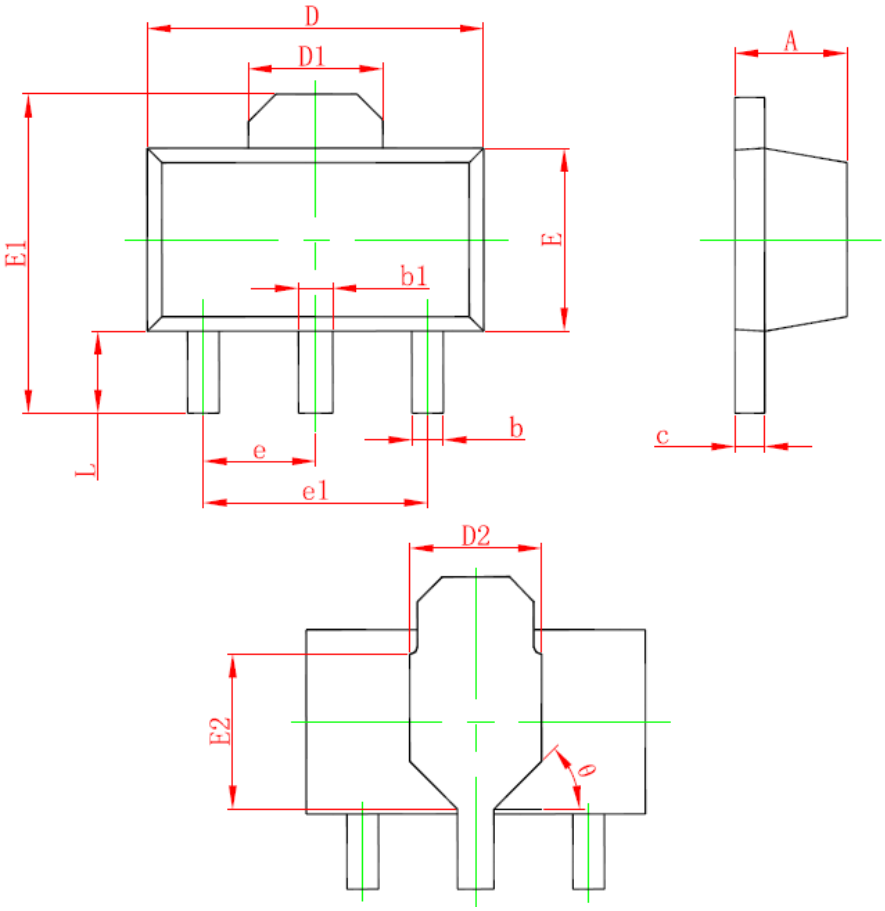


@P_{in}=0.5W, V_{DS}=7.4V, I_{dq}=500mA	
Z_S	7.02 + j 15.30
Z_L	4.92 + j 7.42

12.HTL7G06S006P S-Parameter Data (V_{DD}=7.4V, I_{dq}=500mA)

Freq	S11		S21		S12		S22	
(MHz)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
150	0.99	176.0	7.56	3.5	0.02	-83.3	0.84	15.1
175	0.97	172.4	6.66	-11.2	0.02	-97.2	0.84	-10.1
200	0.96	167.8	5.62	-32.9	0.02	-117.5	0.84	-46.2
250	0.94	161.2	4.44	-68.0	0.02	-151.7	0.84	-106.0
300	0.93	155.3	3.66	-102.2	0.02	175.7	0.84	-165.2
350	0.92	149.6	3.11	-135.8	0.02	144.3	0.83	136.3
400	0.92	144.2	2.70	-169.0	0.02	112.3	0.83	78.0
450	0.92	138.9	2.39	157.8	0.01	80.5	0.83	19.7
500	0.91	133.7	2.16	124.6	0.02	50.4	0.83	-38.6
520	0.91	131.6	2.07	111.2	0.02	37.5	0.84	-62.2
550	0.91	128.6	1.95	91.2	0.02	18.2	0.83	-97.2
600	0.91	123.4	1.77	58.0	0.01	-12.6	0.83	-155.8
650	0.91	118.4	1.62	25.2	0.01	-43.5	0.82	146.2
700	0.90	113.4	1.49	-7.2	0.01	-73.9	0.82	88.8
750	0.90	108.5	1.39	-39.7	0.01	-102.5	0.82	31.7
800	0.90	103.6	1.30	-72.3	0.01	-134.1	0.82	-25.7
850	0.89	98.7	1.23	-105.1	0.01	-164.7	0.82	-83.8
900	0.89	93.9	1.16	-138.2	0.01	162.4	0.81	-142.6
950	0.89	89.1	1.09	-171.1	0.01	131.3	0.81	158.6
1000	0.88	84.5	1.02	156.6	0.01	107.3	0.80	100.7
1050	0.87	80.0	0.97	124.3	0.01	72.7	0.80	43.9
1100	0.87	75.7	0.92	92.5	0.01	42.5	0.79	-12.8
1150	0.87	71.5	0.89	60.4	0.01	12.7	0.80	-70.4
1200	0.87	67.0	0.86	27.8	0.01	-18.1	0.79	-128.5
1250	0.87	62.5	0.83	-4.9	0.01	-49.3	0.79	172.8
1300	0.87	57.9	0.80	-37.5	0.01	-79.2	0.78	114.6
1350	0.87	53.3	0.78	-70.0	0.01	-108.3	0.78	56.6
1400	0.87	48.8	0.75	-102.4	0.01	-140.5	0.79	-0.8
1450	0.86	44.3	0.74	-135.0	0.01	-172.2	0.79	-58.6
1500	0.86	39.8	0.72	-167.7	0.01	158.4	0.78	-117.6

13.Recommended PCB Pad Layout



Symbol	Dimesions in Milimeters		Dimesions in Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
D2	1.750 REF.		0.069 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
E2	1.900 REF.		0.075 REF.	
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047
θ	45°		45°	

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