



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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V_{DSS}	-30V
$R_{DS(on)}$ (Max.)	21m Ω
I_D	-7.5A
P_D	2.0W

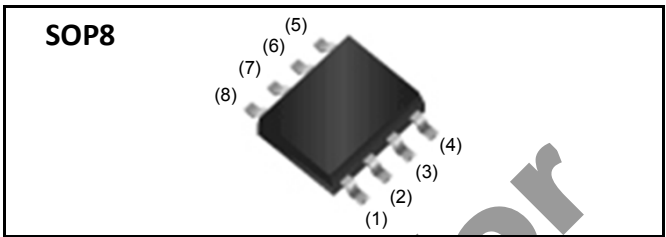
●Features

- 1) Low on - resistance.
- 2) Built-in G-S Protection Diode.
- 3) Small Surface Mount Package (SOP8).
- 4) Pb-free lead plating ; RoHS compliant

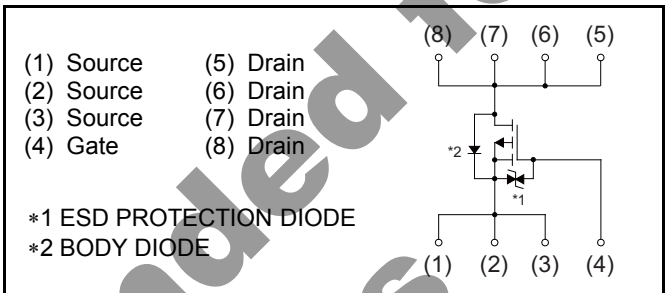
●Application

DC/DC Converter

●Outline



●Inner circuit



●Packaging specifications

Type	Packaging	Taping
	Reel size (mm)	330
	Tape width (mm)	12
	Basic ordering unit (pcs)	2,500
	Taping code	TB
	Marking	RRH075P03

●Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Drain - Source voltage	V_{DSS}	-30	V
Continuous drain current	I_D^{*1}	± 7.5	A
Pulsed drain current	$I_{D,pulse}^{*2}$	± 30	A
Gate - Source voltage	V_{GSS}	± 20	V
Avalanche energy, single pulse	E_{AS}^{*3}	0.5	mJ
Power dissipation	P_D^{*4}	2.0	W
	P_D^{*5}	0.65	W
Junction temperature	T_j	150	$^\circ\text{C}$
Range of storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

●Thermal resistance

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Thermal resistance, junction - ambient	R_{thJA}^{*4}	-	-	62.5	°C/W
Thermal resistance, junction - ambient	R_{thJA}^{*5}	-	-	192	°C/W

●Electrical characteristics($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Drain - Source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -1mA$	-30	-	-	V
Breakdown voltage temperature coefficient	$\frac{\Delta V_{(BR)DSS}}{\Delta T_j}$	$I_D = -1mA$ referenced to 25°C	-	-25	-	mV/°C
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$	-	-	-1	μA
Gate - Source leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 10	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = -10V, I_D = -1mA$	-1	-	-2.5	V
Gate threshold voltage temperature coefficient	$\frac{\Delta V_{(GS)th}}{\Delta T_j}$	$I_D = -1mA$ referenced to 25°C	-	3.9	-	mV/°C
Static drain - source on - state resistance	$R_{DS(on)}^{*6}$	$V_{GS} = -10V, I_D = -7.5A$	-	15	21	m Ω
		$V_{GS} = -4.5V, I_D = -4A$	-	22	31	
		$V_{GS} = -4.0V, I_D = -4A$	-	25	35	
		$V_{GS} = -10V, I_D = -7.5A, T_j = 125^\circ\text{C}$	-	23	33	
Gate input resistance	R_G	$f = 1\text{MHz}, \text{open drain}$	-	4	-	Ω
Transconductance	g_{fs}^{*6}	$V_{DS} = -10V, I_D = -7.5A$	9	18	-	S

*1 Limited only by maximum temperature allowed.

*2 $P_w \leq 10\mu\text{s}$, Duty cycle $\leq 1\%$

*3 $L \approx 10\mu\text{H}$, $V_{DD} = -15V$, $R_g = 25\Omega$, starting $T_j = 25^\circ\text{C}$

*4 Mounted on a ceramic board (30×30×0.8mm)

*5 Mounted on a FR4 (20×20×0.8mm)

●Electrical characteristics($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Input capacitance	C_{iss}	$V_{GS} = 0\text{V}$	-	1900	-	pF
Output capacitance	C_{oss}	$V_{DS} = -10\text{V}$	-	250	-	
Reverse transfer capacitance	C_{rss}	$f = 1\text{MHz}$	-	250	-	
Turn - on delay time	$t_{d(on)}^{*6}$	$V_{DD} \approx -15\text{V}, V_{GS} = -10\text{V}$	-	14	-	ns
Rise time	t_r^{*6}	$I_D = -4\text{A}$	-	25	-	
Turn - off delay time	$t_{d(off)}^{*6}$	$R_L = 3.8\Omega$	-	100	-	
Fall time	t_f^{*6}	$R_G = 10\Omega$	-	70	-	

●Gate Charge characteristics($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Total gate charge	Q_g^{*6}	$V_{DD} \approx -15\text{V}, I_D = -7.5\text{A}$ $V_{GS} = -5\text{V}$	-	21	-	nC
		$V_{DD} \approx -15\text{V}, I_D = -7.5\text{A}$ $V_{GS} = -10\text{V}$	-	41	-	
Gate - Source charge	Q_{gs}^{*6}	$V_{DD} \approx -15\text{V}, I_D = -7.5\text{A}$	-	5	-	
Gate - Drain charge	Q_{gd}^{*6}	$V_{GS} = -5\text{V}$	-	7	-	

●Body diode electrical characteristics (Source-Drain)($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Inverse diode continuous, forward current	I_S^{*1}	$T_a = 25^\circ\text{C}$	-	-	-1.6	A
Forward voltage	V_{SD}^{*6}	$V_{GS} = 0\text{V}, I_S = -7.5\text{A}$	-	-	-1.2	V
Reverse recovery time	t_{rr}^{*6}	$I_S = -7.5\text{A}$	-	30	60	ns
Reverse recovery charge	Q_{rr}^{*6}	$di/dt = 100\text{A} / \mu\text{s}$	-	20	40	μC

*6 Plused

●Electrical characteristic curves

Fig.1 Power Dissipation Derating Curve

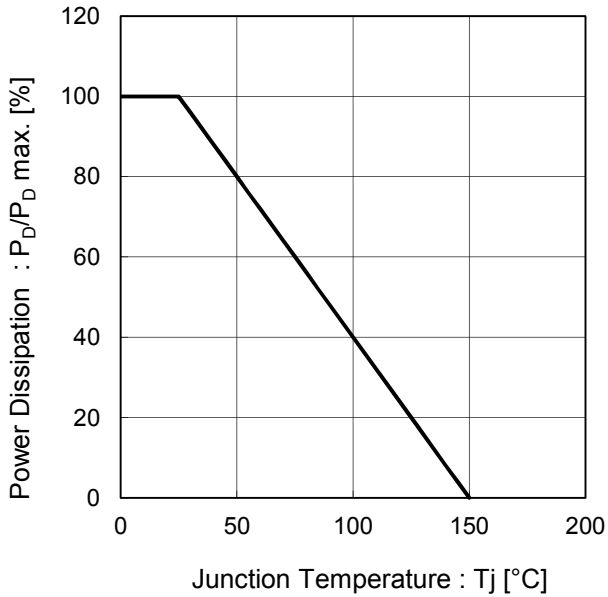


Fig.2 Maximum Safe Operating Area

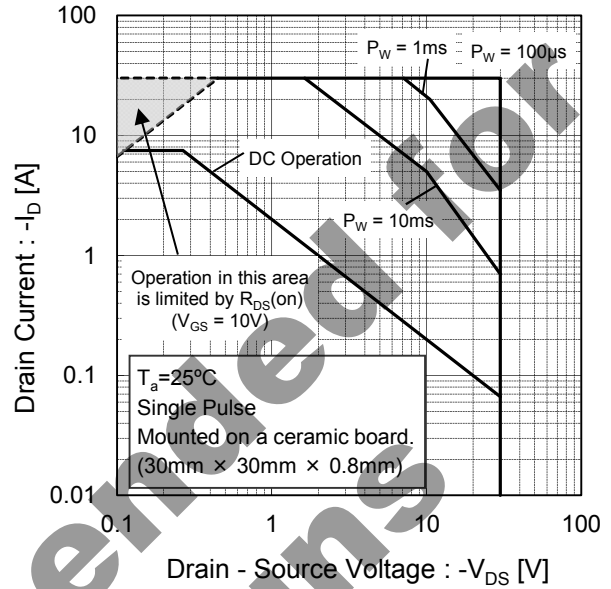


Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width

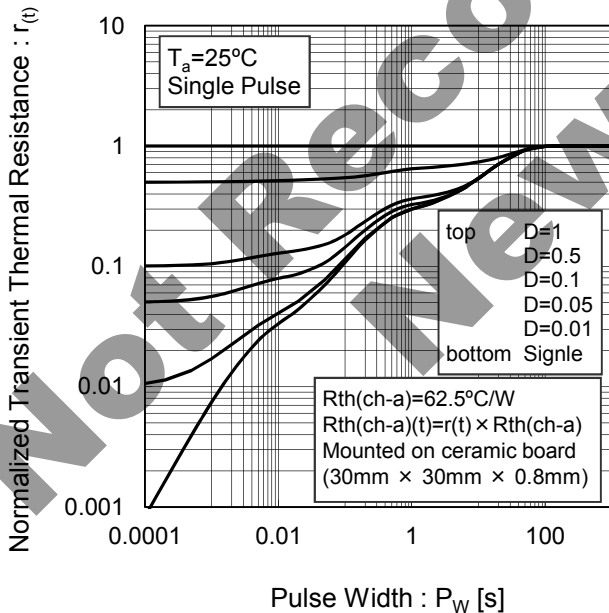
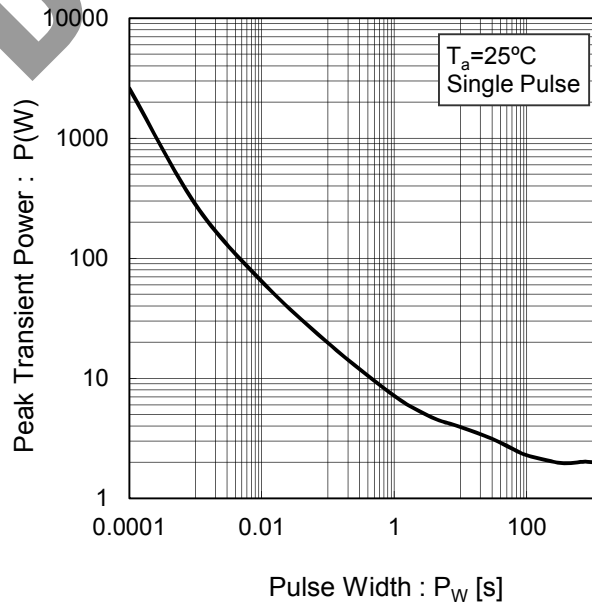


Fig.4 Single Pulse Maximum Power dissipation



●Electrical characteristic curves

Fig.5 Avalanche Current vs Inductive Load

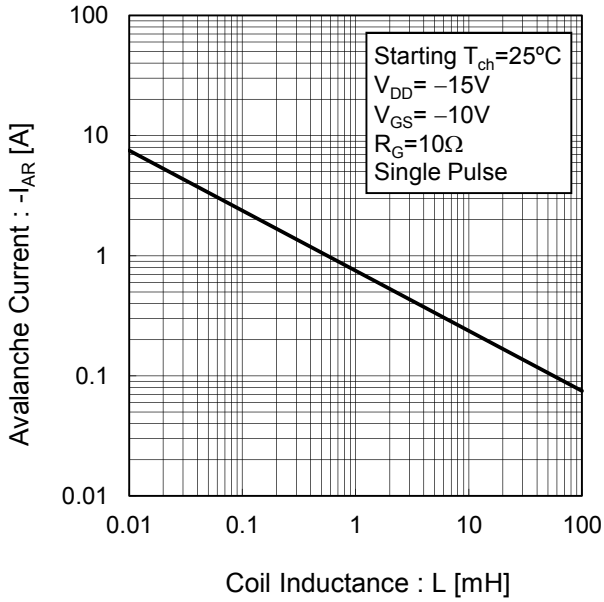


Fig.6 Avalanche Energy Derating Curve vs Junction Temperature

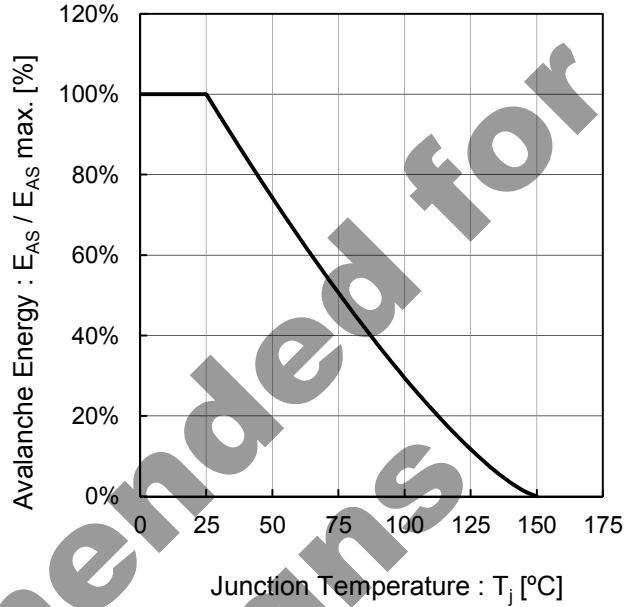


Fig.7 Typical Output Characteristics(I)

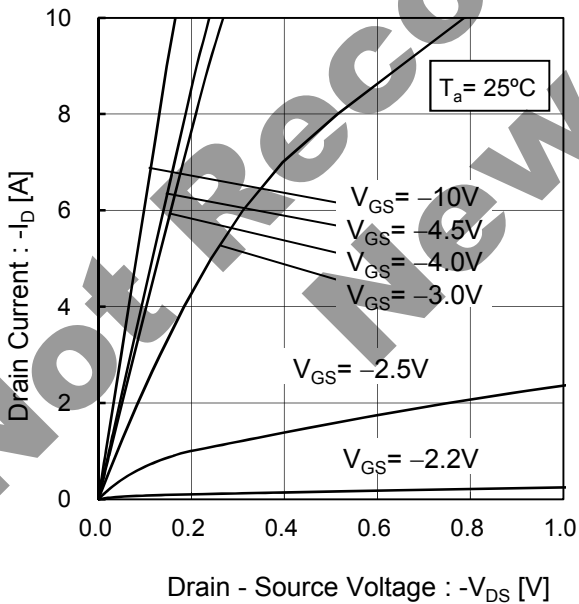
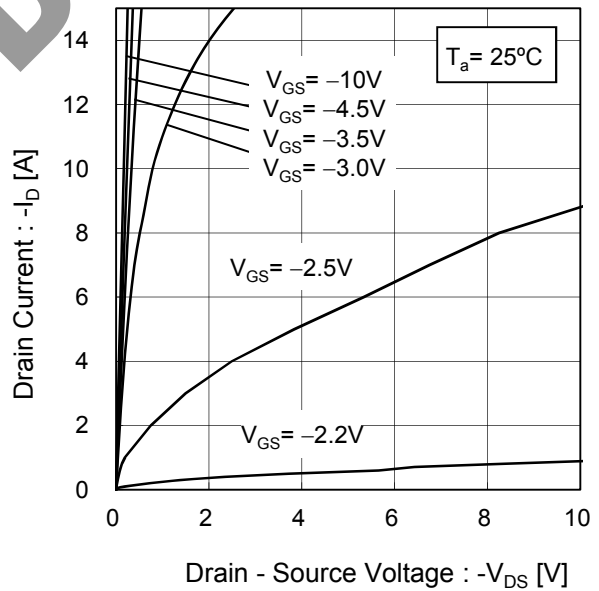


Fig.8 Typical Output Characteristics(II)



●Electrical characteristic curves

Fig.9 Breakdown Voltage vs. Junction Temperature

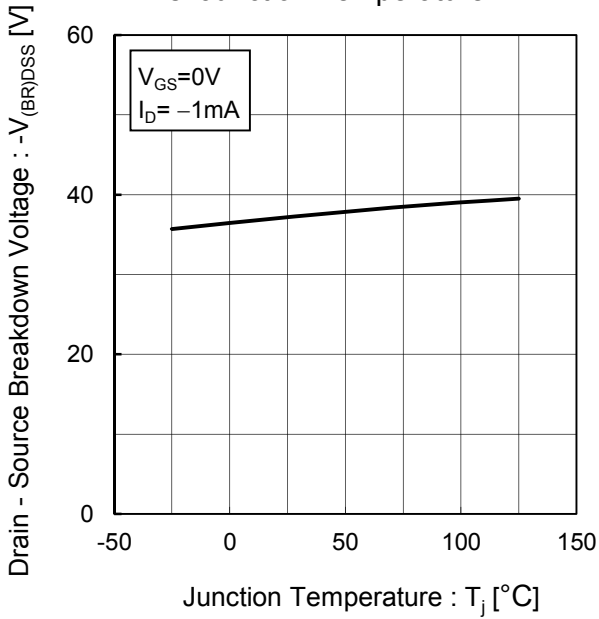


Fig.10 Typical Transfer Characteristics

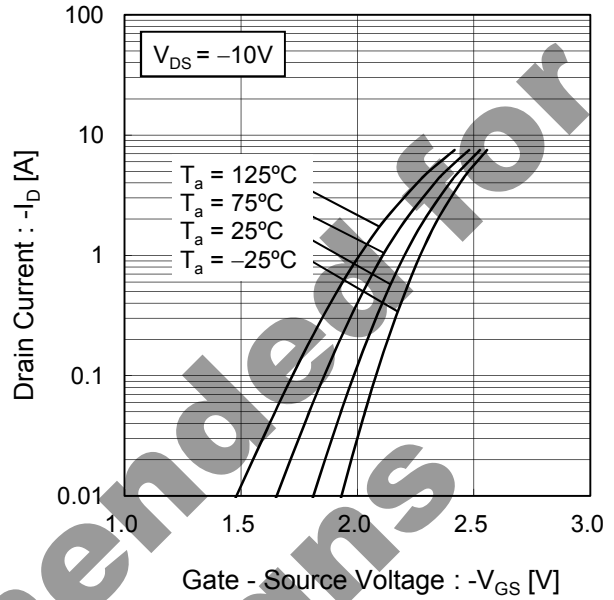


Fig.11 Gate Threshold Voltage vs. Junction Temperature

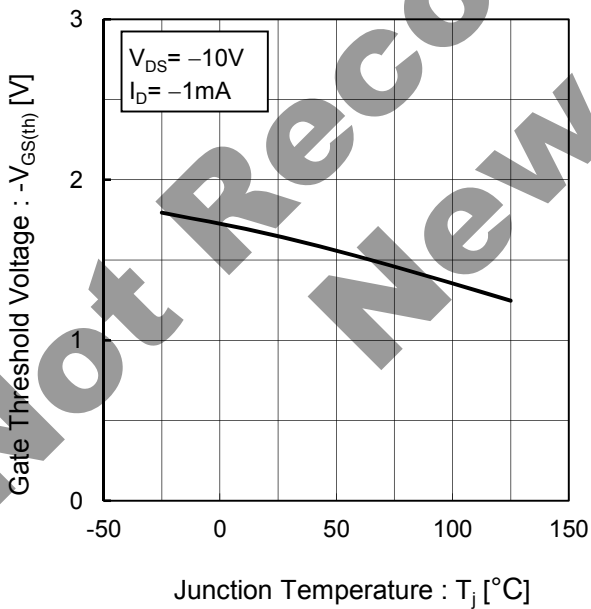
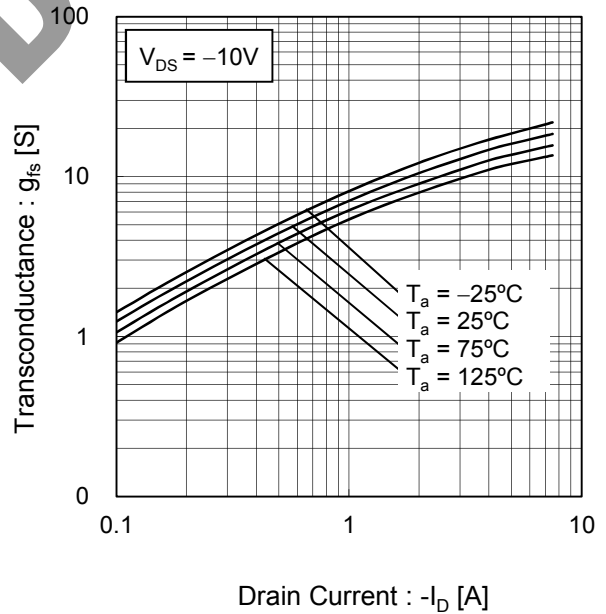


Fig.12 Transconductance vs. Drain Current



●Electrical characteristic curves

Fig.13 Drain Current Derating Curve

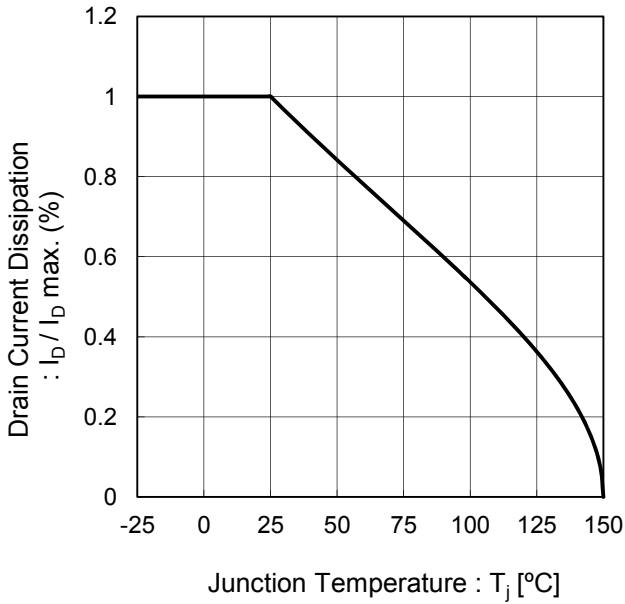


Fig.14 Static Drain - Source On - State Resistance vs. Gate Source Voltage

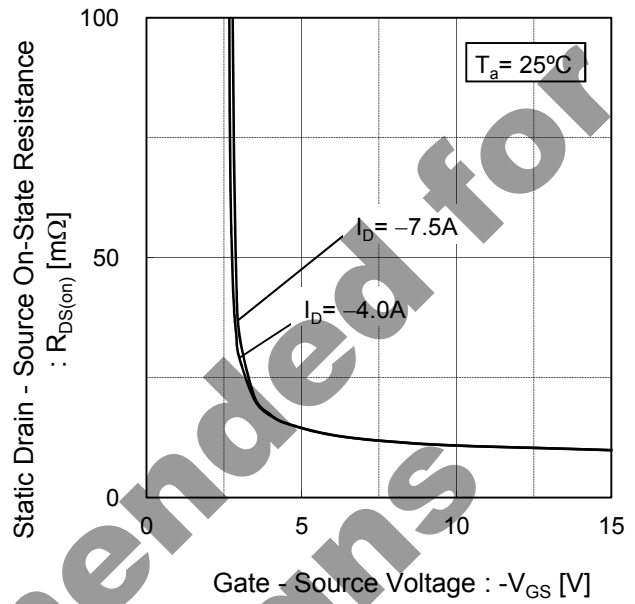


Fig.15 Static Drain - Source On - State Resistance vs. Drain Current (I)

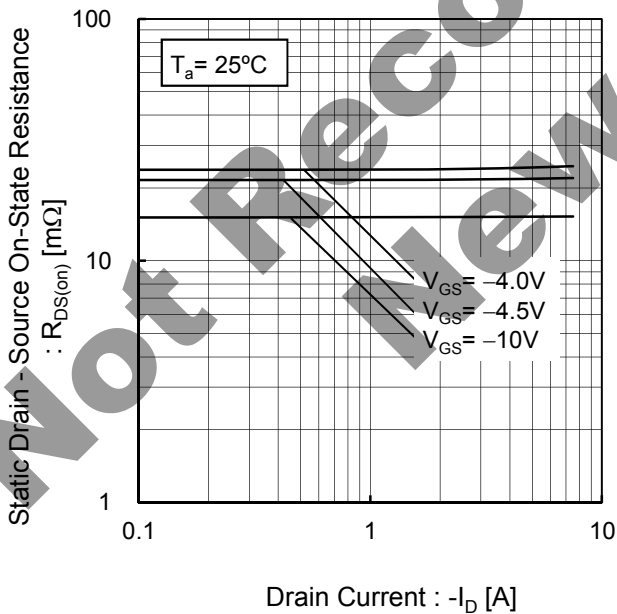
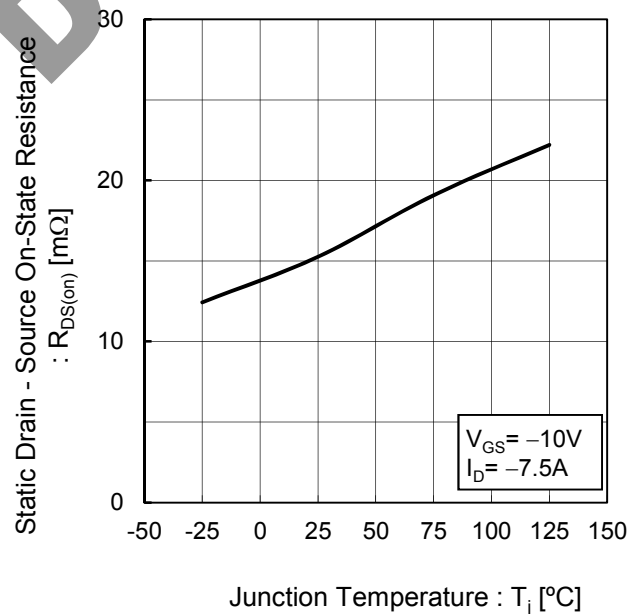


Fig.16 Static Drain - Source On - State Resistance vs. Junction Temperature



●Electrical characteristic curves

Fig.17 Static Drain - Source On - State Resistance vs. Drain Current(II)

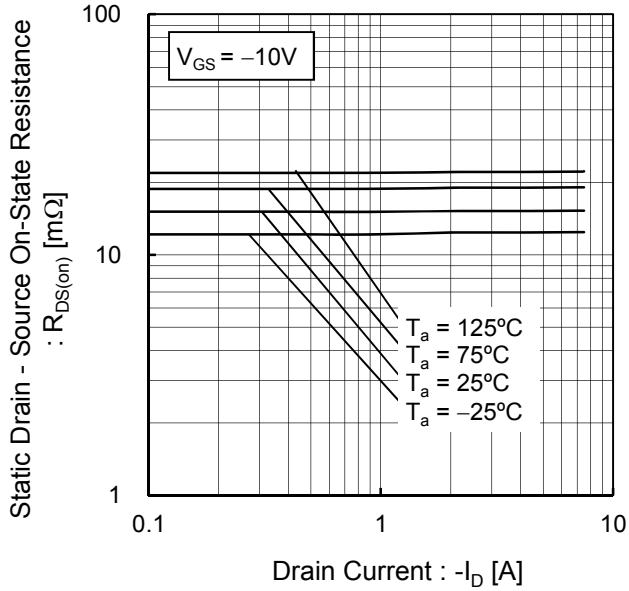


Fig.18 Static Drain - Source On - State Resistance vs. Drain Current(III)

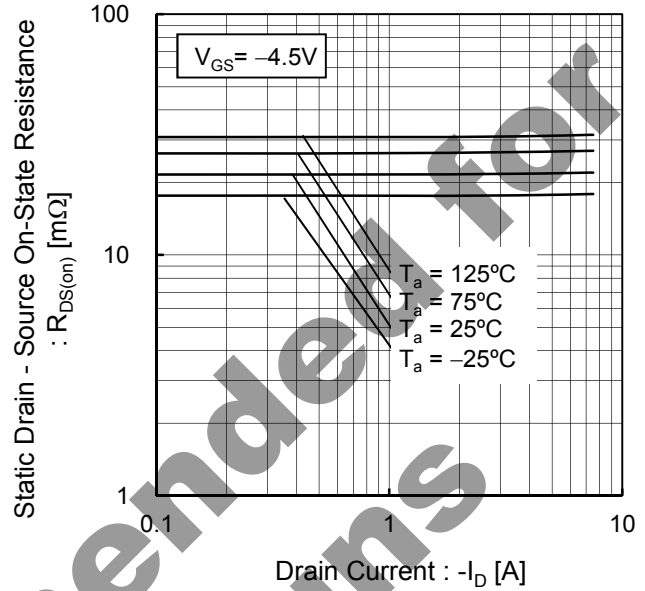
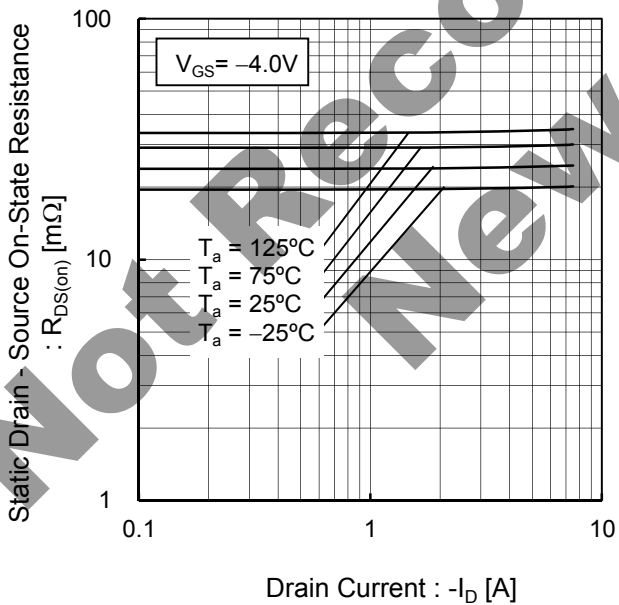


Fig.19 Static Drain - Source On - State Resistance vs. Drain Current(IV)



●Electrical characteristic curves

Fig.20 Typical Capacitance vs. Drain - Source Voltage

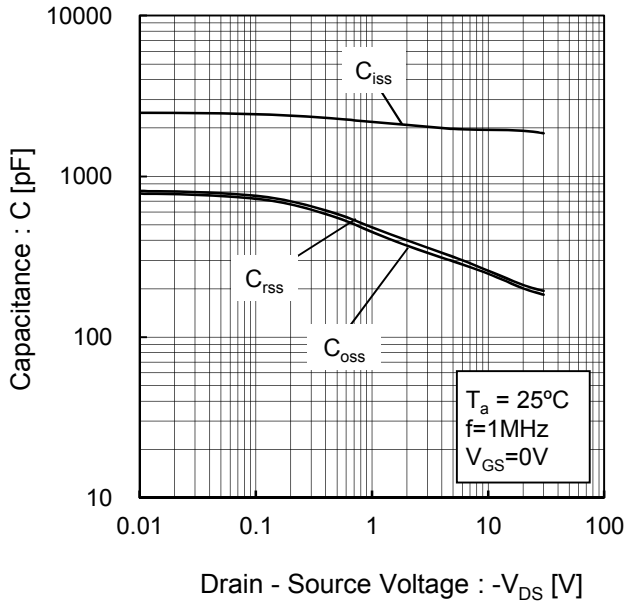


Fig.21 Switching Characteristics

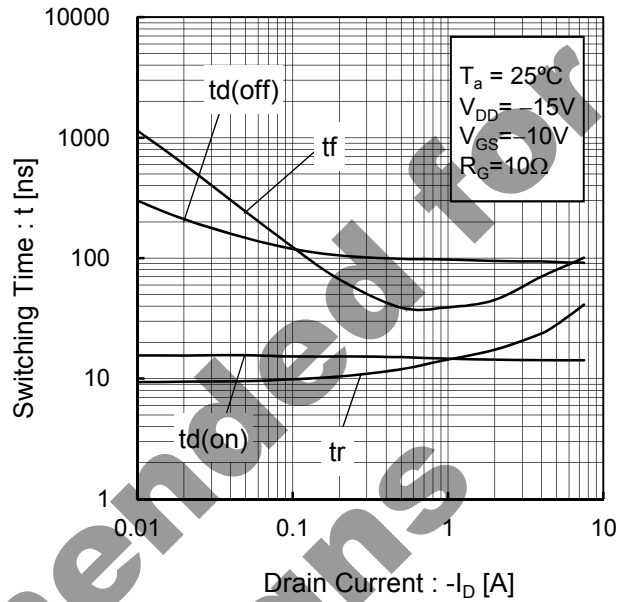


Fig.22 Dynamic Input Characteristics

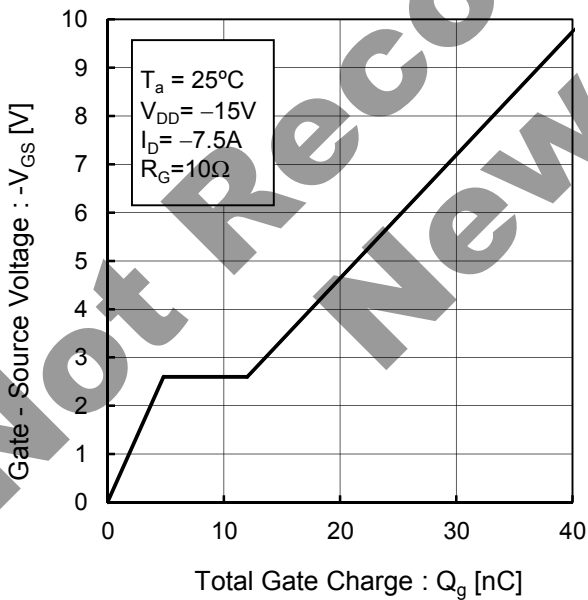
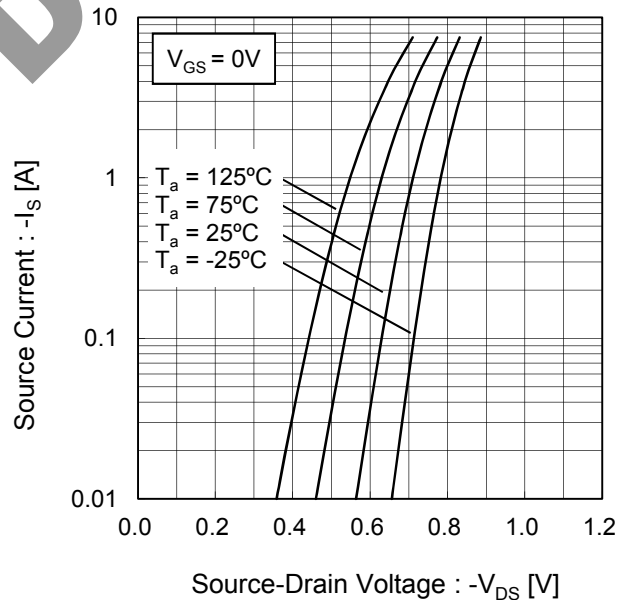


Fig.23 Source Current vs. Source Drain Voltage



●Measurement circuits

Fig.1-1 Switching Time Measurement Circuit

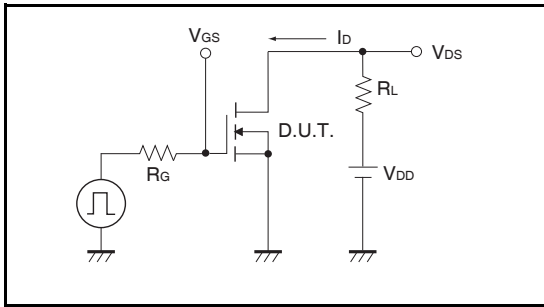


Fig.1-2 Switching Waveforms

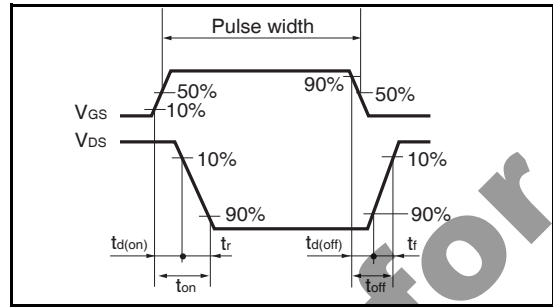


Fig.2-1 Gate Charge Measurement Circuit

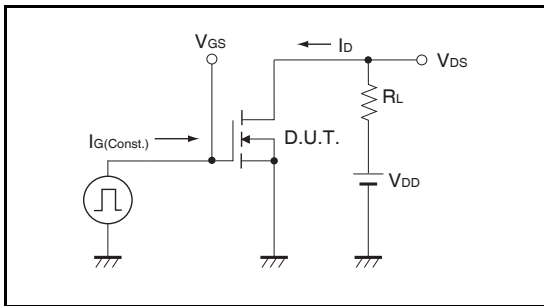


Fig.2-2 Gate Charge Waveform

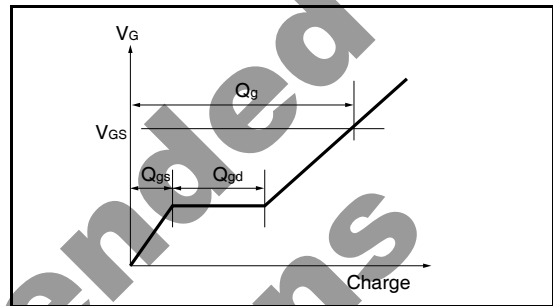


Fig.3-1 Avalanche Measurement Circuit

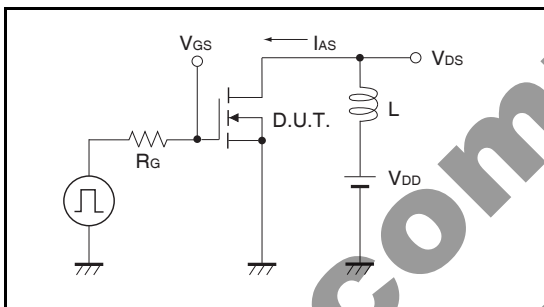
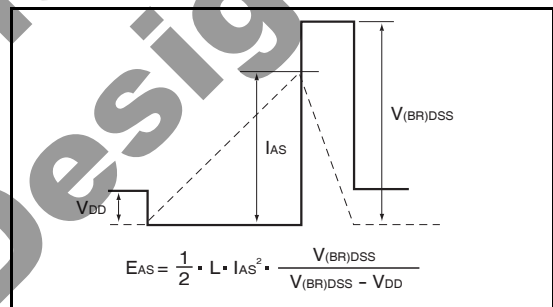


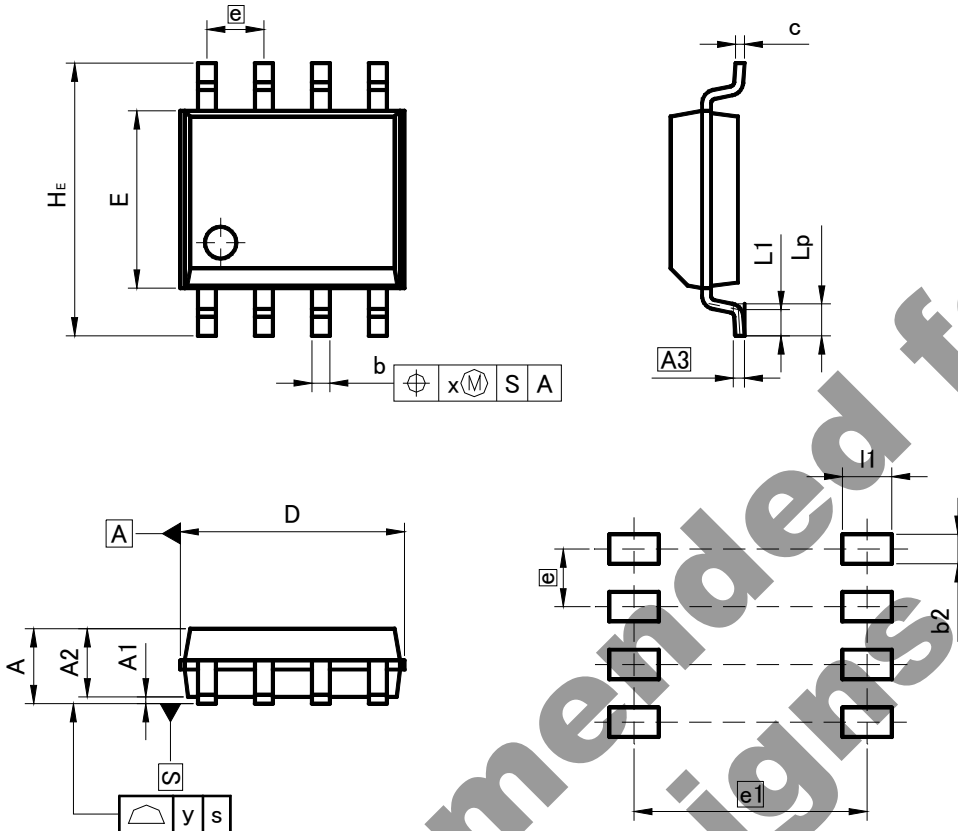
Fig.3-2 Avalanche Waveform



Not Recommended for New Designs

●Dimensions (Unit : mm)

SOP8



Pattern of terminal position areas

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	1.75	-	0.069
A1	0.15		0.006	
A2	1.40	1.60	0.055	0.063
A3	0.25		0.01	
b	0.30	0.50	0.012	0.02
c	0.10	0.30	0.004	0.012
D	4.80	5.20	0.189	0.205
E	3.75	4.05	0.148	0.159
e	1.27		0.05	
HE	5.70	6.30	0.224	0.248
L1	0.50	0.70	0.02	0.028
Lp	0.65	0.85	0.026	0.033
x	0.15		0.006	
y	0.10		0.004	

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.65	-	0.026
e1	5.15		0.203	
l1	-	1.15	-	0.045

Dimension in mm/inches

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