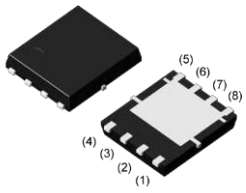
AD30N80D5

Datasheet

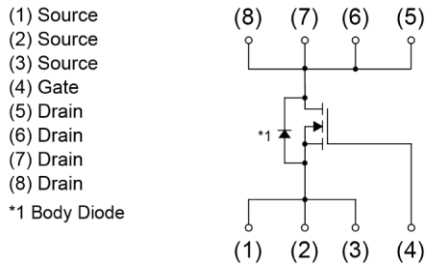
V_{DSS}	30V
$R_{DS(on)}$(Max.)	2.1mΩ
I_D	±80A
P_D	34W

Outline

HSOP8



Inner circuit



Features

1) Low on - resistance
2) High power package (HSOP8)
3) Pb-free lead plating ; RoHS compliant
4) Halogen free
5) 100% Rg and UIS tested

Packaging specifications

Type	Packing	Embossed Tape
	Reel size (mm)	330
	Tape width (mm)	12
	Basic ordering unit (pcs)	2500
	Taping code	TB1

Application

Switching

Absolute maximum ratings (T_a = 25°C, unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain - Source voltage		V_{DSS}	30	V
Continuous drain current	T_c = 25°C	I_{D} *1D	±80	A
	T_a = 25°C	I_D	±32	A
Pulsed drain current		I_{D} *2P	±128	A
Gate - Source voltage		V_{GSS}	±20	V
Avalanche current, single pulse		I_{A} *3S	32	A
Avalanche energy, single pulse		E_{A} *3S	77	mJ
Power dissipation		P *1D	34	W
		P *4D	3.0	W
Junction temperature		T_j	150	°C
Operating junction and storage temperature range		T_{stg}	-55 to +150	°C

Thermal resistance

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Thermal resistance, junction - case	R_{thJC} *1	-	-	3.6	°C/W
Thermal resistance, junction - ambient	R_{thJA} *4	-	-	41.7	°C/W

Electrical characteristics (T_a = 25°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	-	28	-	mV/°C
Zero gate voltage drain current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V	-	-	1	μA
Gate - Source leakage current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1mA	1.2	-	2.5	V
Gate threshold voltage temperature coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_j}$	I_D = 1mA referenced to 25°C	-	-3.87	-	mV/°C
Static drain - source on - state resistance	$R_{DS(on)}$ *5	V_{GS} = 10V, I_D = 32A	-	1.4	2.1	mΩ
		V_{GS} = 4.5V, I_D = 32A	-	1.8	2.9	
Gate resistance	R_G	f=1MHz, open drain	-	1.4	-	Ω
Forward Transfer Admittance	$\|Y_{fs}\|$ *5	V_{DS} = 5V, I_D = 32A	35.0	-	-	S

*1 Tc = 25°C, Limited only by maximum temperature allowed.

*2 Pw≦10μs , Duty cycle≦1%

*3 L ≒ 0.1mH, V_{DD} = 15V, R_G = 25Ω, Starting T_j = 25°C Fig.3-1,3-2

*4 Mounted on a Cu board (40×40×0.8mm)

*5 Pulsed

Electrical characteristics (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Input capacitance	C_{iss}	V_{GS} = 0V V_{DS} = 15V	-	2850	-	pF
Output capacitance	C_{oss}	f = 1MHz	-	740	-	
Reverse transfer capacitance	C_{rss}		-	210	-	
Turn - on delay time	$t_{d(on)}$ *5	V_{DD} ≒ 15V,V_{GS} = 10V	-	21.8	-	ns
Rise time	t_r *5	I_D = 16A R_L ≒ 0.93Ω R_G = 10Ω	-	15.6	-	
Turn - off delay time	$t_{d(off)}$ *5		-	74.6	-	
Fall time	t_f *5		-	28.5	-	

IGate charge characteristics (T_a = 25°C)

Parameter	Symbol	Conditions		Values			Unit
				Min.	Typ.	Max.	
Total gate charge	Q *5 g	V_{DD} ≒ 15V I_D = 32A	V_{GS} = 10V	-	42.8	-	nC
			V_{GS} = 4.5V	-	19.6	-	
Gate - Source charge	Q_{gs} *5			-	11.6	-	
Gate - Drain charge	Q_g *5 d			-	6.7	-	

IBody diode electrical characteristics (Source-Drain) (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Continuous forward current	I_S	T_a = 25°C	-	-	2.5	A
Pulse forward current	I_S *2 P		-	-	128	A
Forward voltage	V_S *5 D	V_{GS} = 0V, I_S = 2.5A	-	-	1.2	V
Reverse recovery time	t_r *5 r	I_S = 32A, V_{GS} =0V di/dt = 100A/μs	-	37.8	-	ns
Reverse recovery charge	*5 Q_{rr}		-	35.2	-	nC

Electrical characteristic curves

Fig.1 Power Dissipation Derating Curve

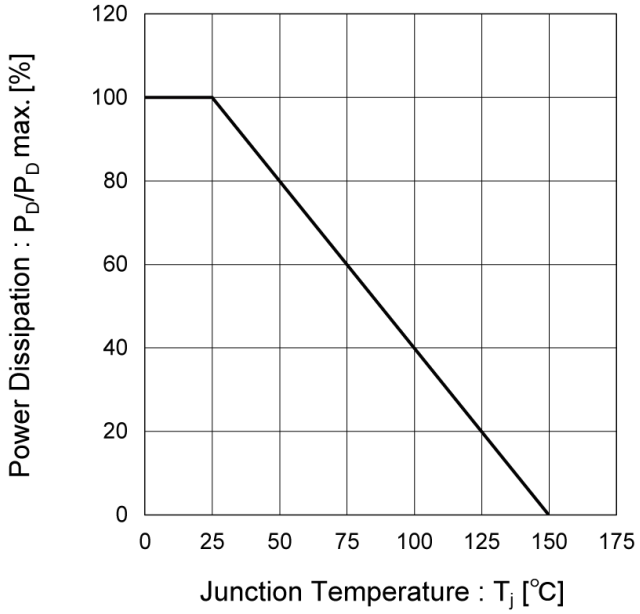


Fig.2 Maximum Safe Operating Area

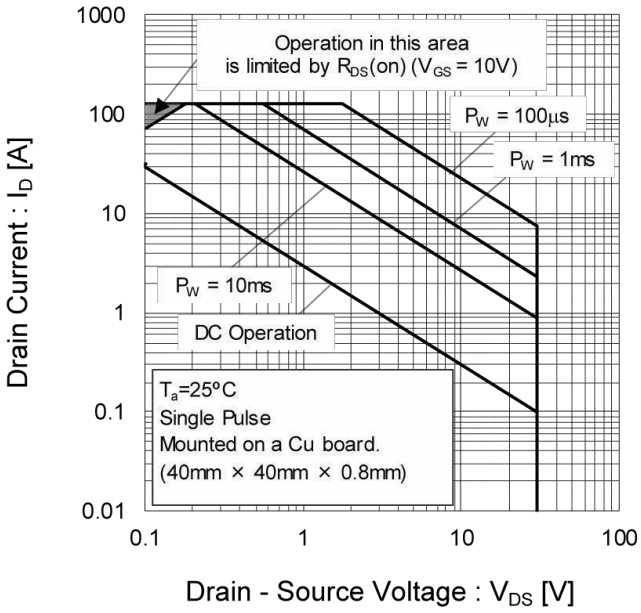


Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width

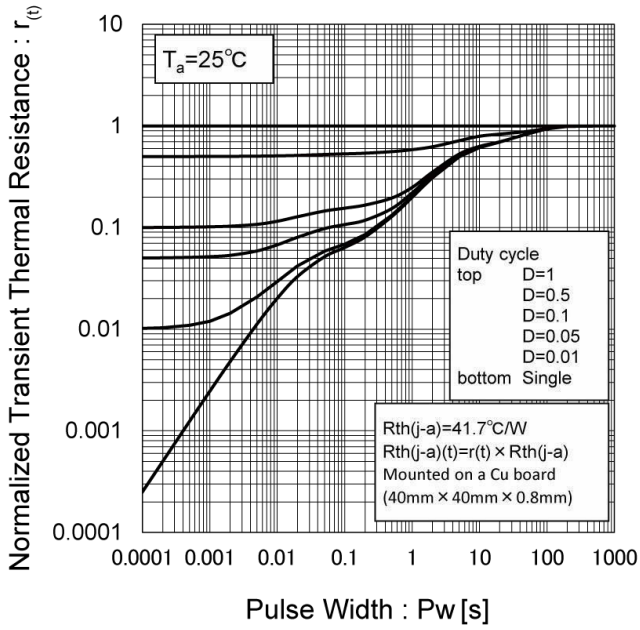
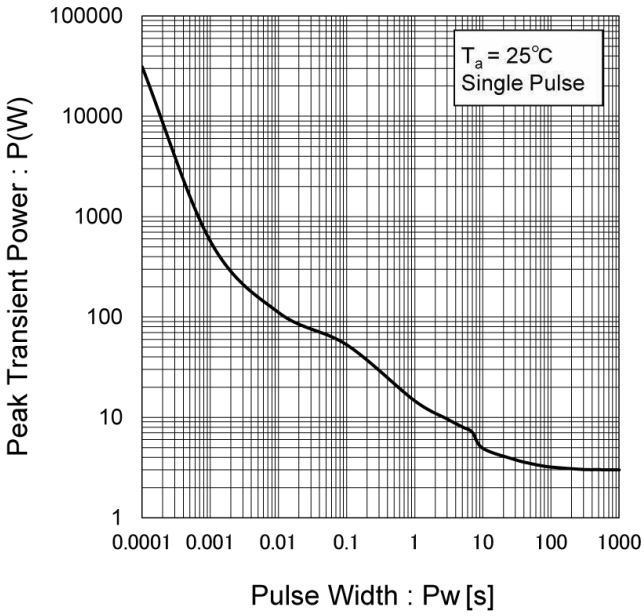


Fig.4 Single Pulse Maximum Power dissipation



Electrical characteristic curves

Fig.5 Typical Output Characteristics(I)

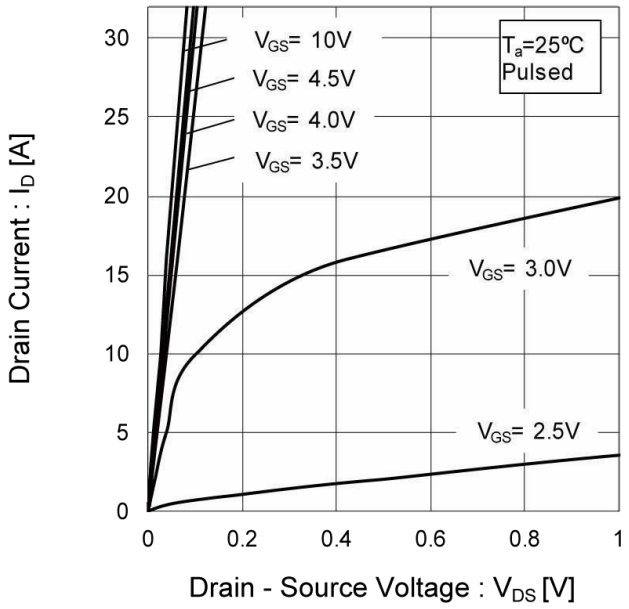


Fig.6 Typical Output Characteristics(II)

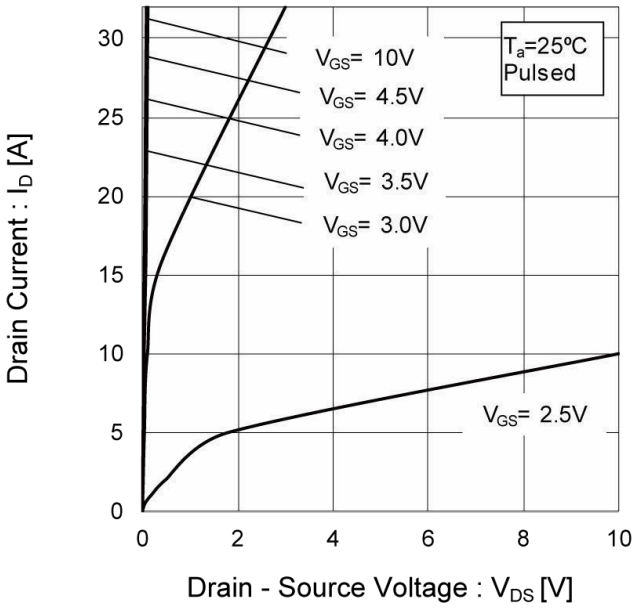


Fig.7 Breakdown Voltage vs. Junction Temperature

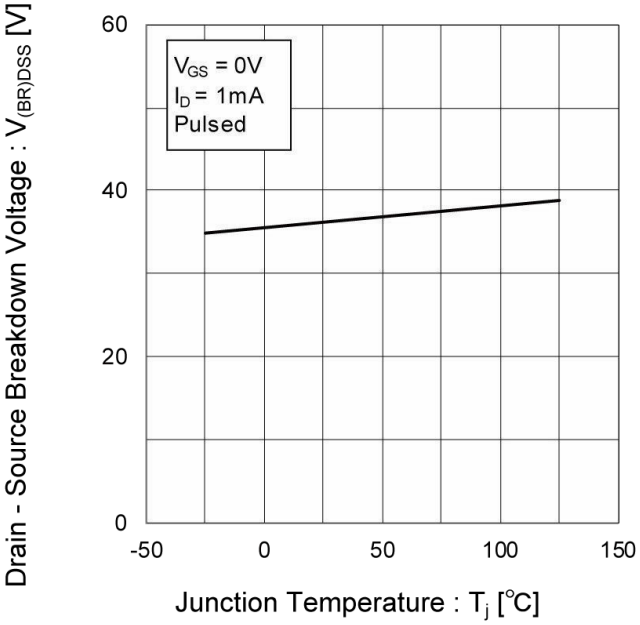
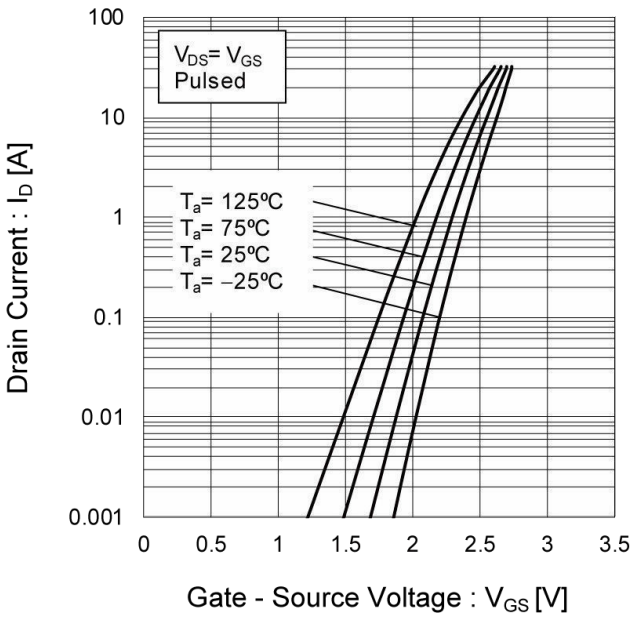


Fig.8 Typical Transfer Characteristics



Electrical characteristic curves

Fig.9 Gate Threshold Voltage vs. Junction Temperature

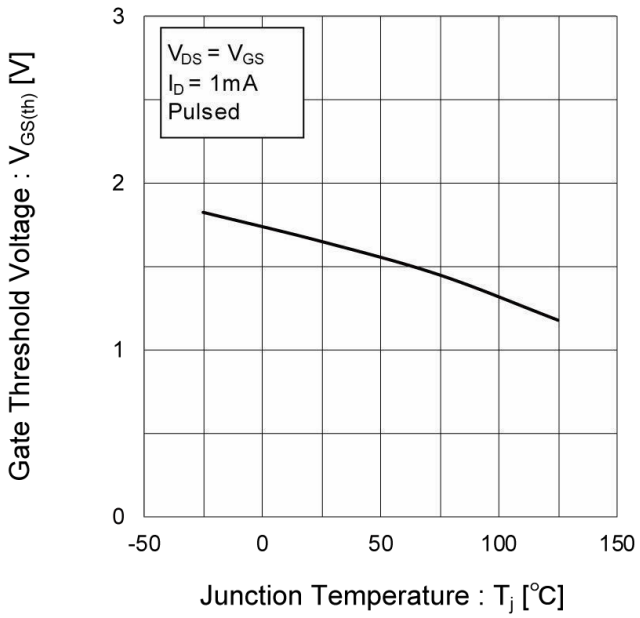


Fig.10 Forward Transfer Admittance vs. Drain Current

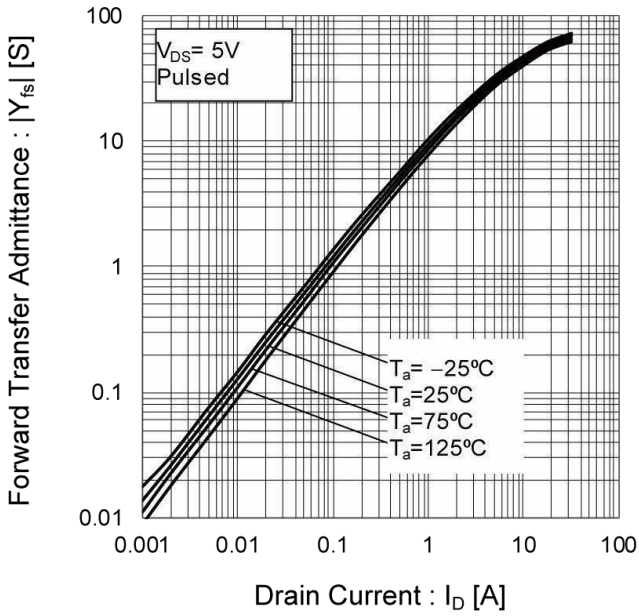


Fig.11 Drain Current Derating Curve

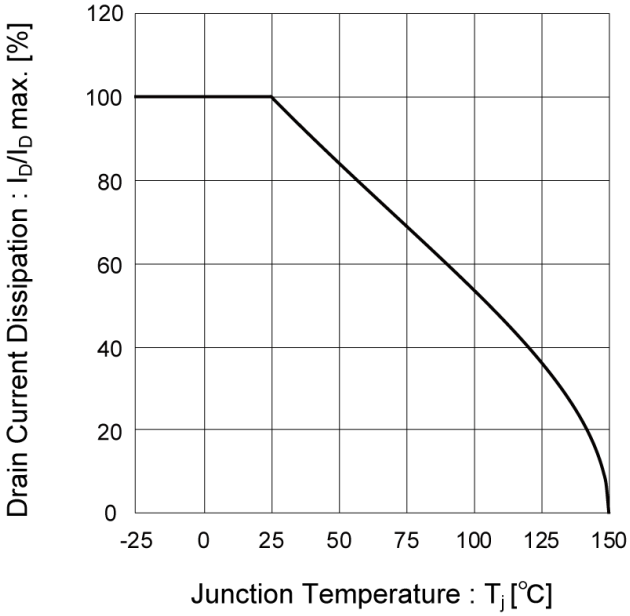
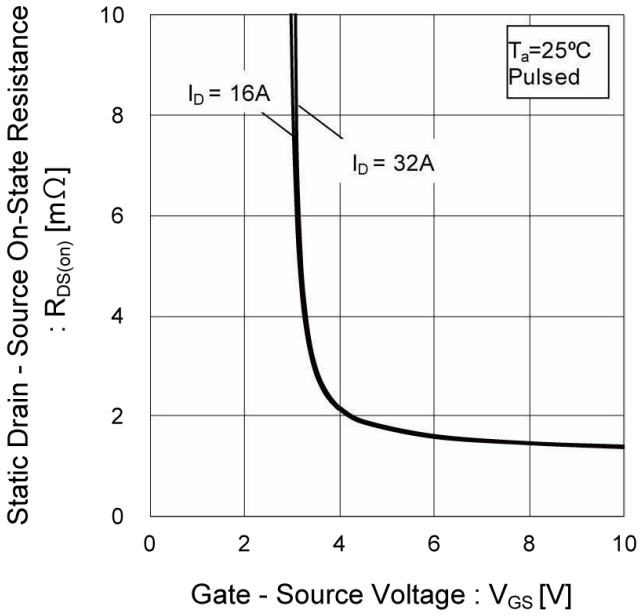


Fig.12 Static Drain - Source On - State Resistance vs. Gate Source Voltage



Electrical characteristic curves

Fig.13 Static Drain - Source On - State Resistance vs. Junction Temperature

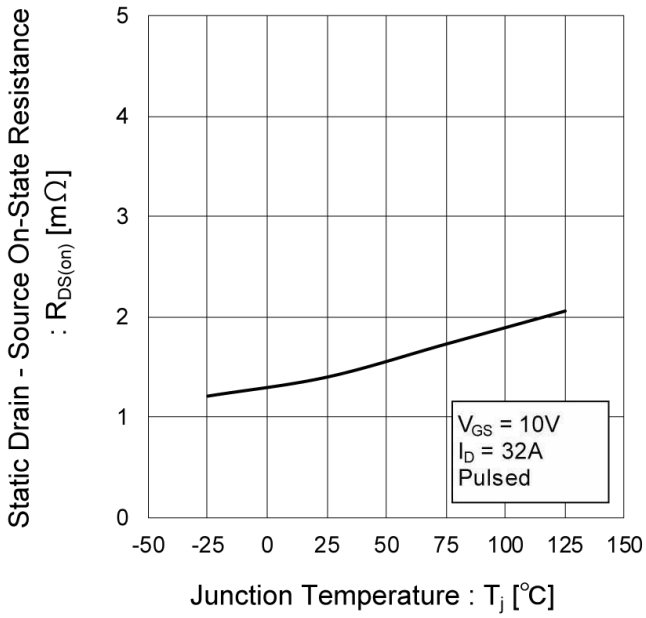


Fig.14 Static Drain - Source On - State Resistance vs. Drain Current (I)

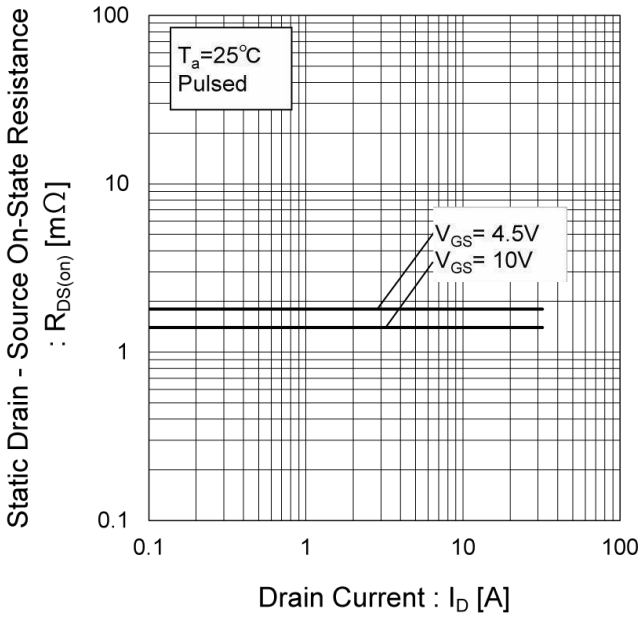


Fig.15 Static Drain - Source On - State Resistance vs. Drain Current (II)

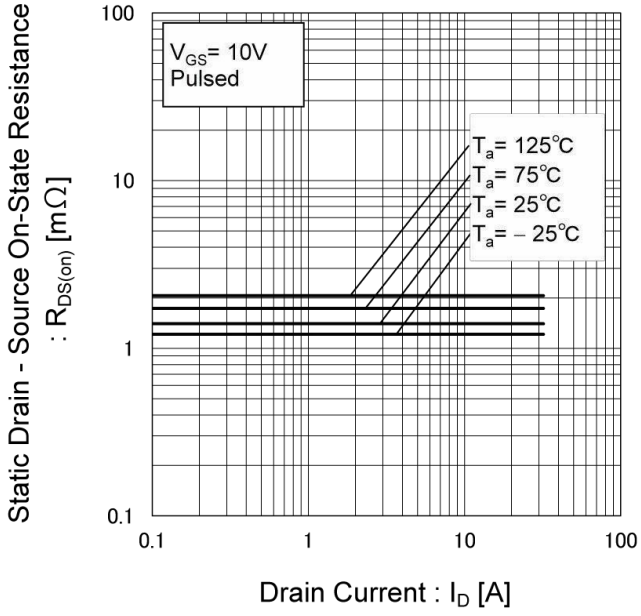
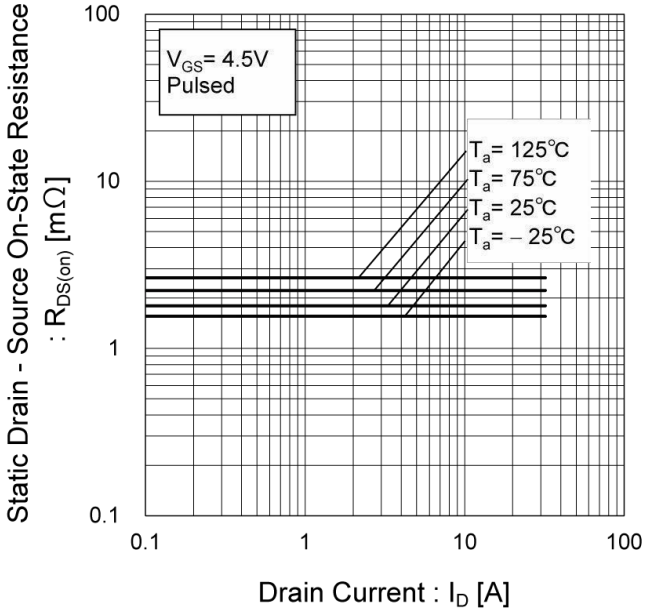


Fig.16 Static Drain - Source On - State Resistance vs. Drain Current (III)



Electrical characteristic curves

Fig.17 Typical Capacitance vs. Drain - Source Voltage

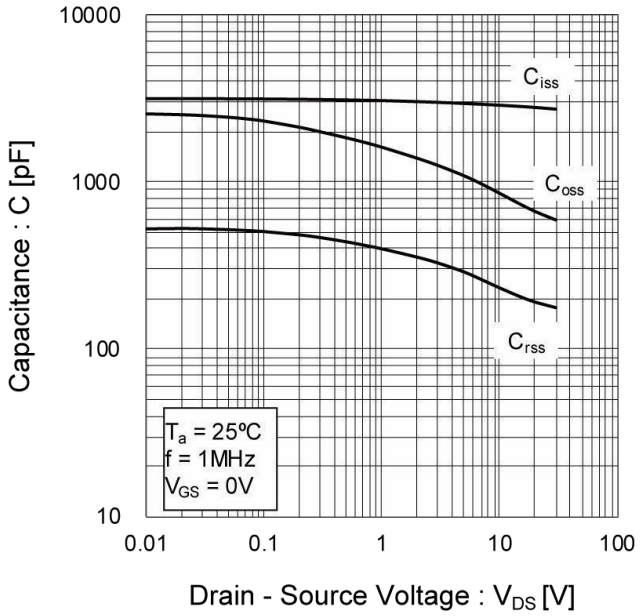


Fig.18 Switching Characteristics

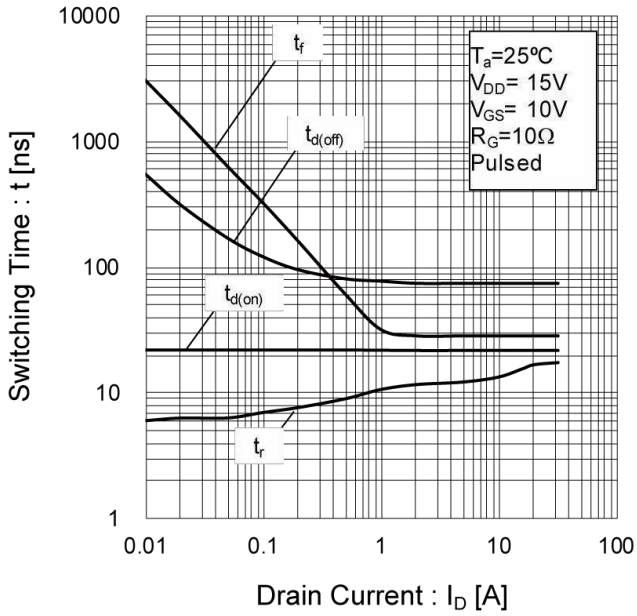


Fig.19 Dynamic Input Characteristics

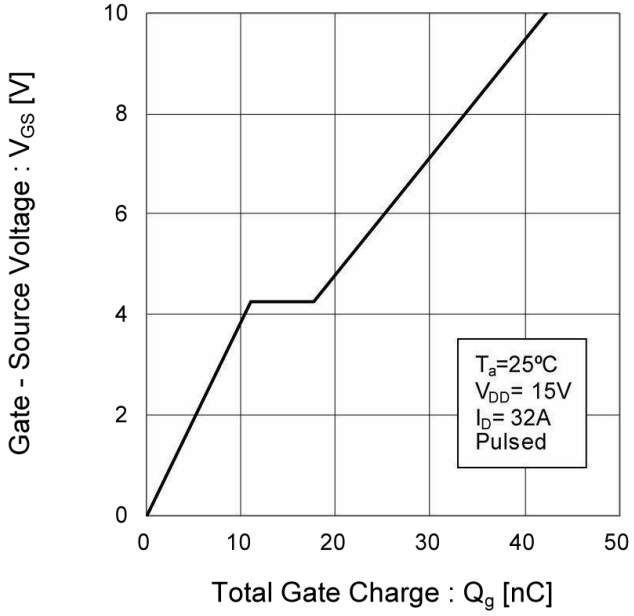
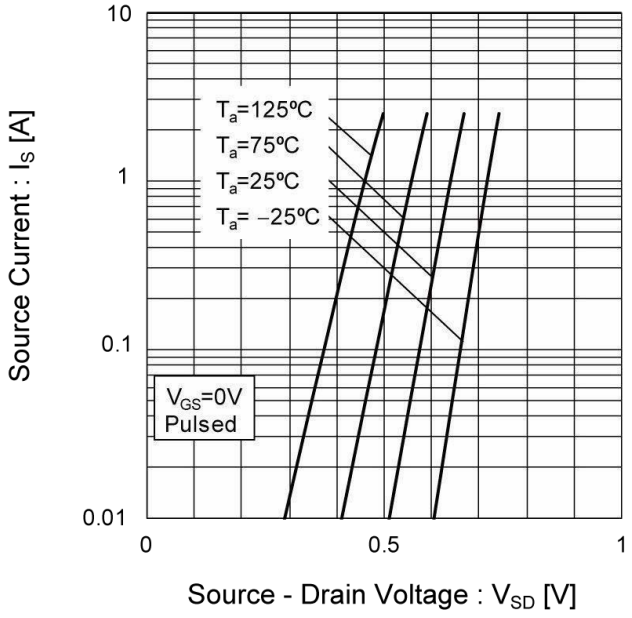


Fig.20 Source Current vs. Source Drain Voltage



Measurement circuits

Fig.1-1 Switching Time Measurement Circuit

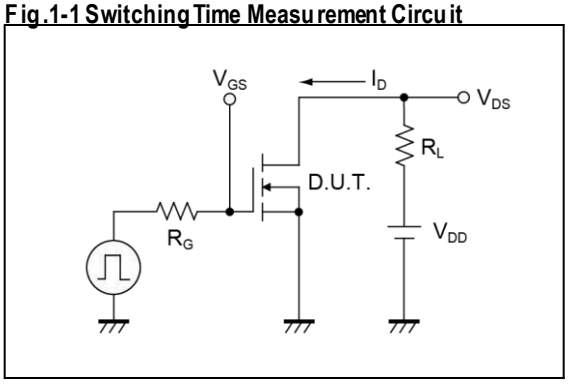


Fig.1-2 Switching Waveforms

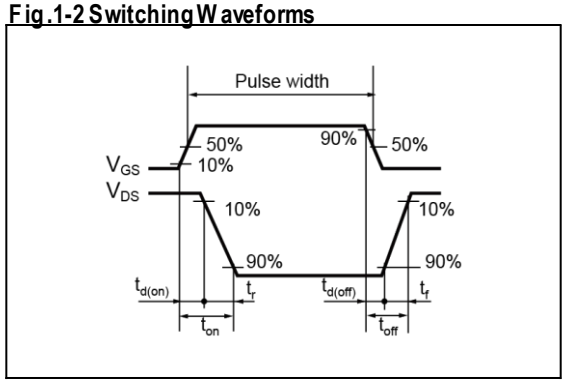


Fig.2-1 Gate Charge Measurement Circuit

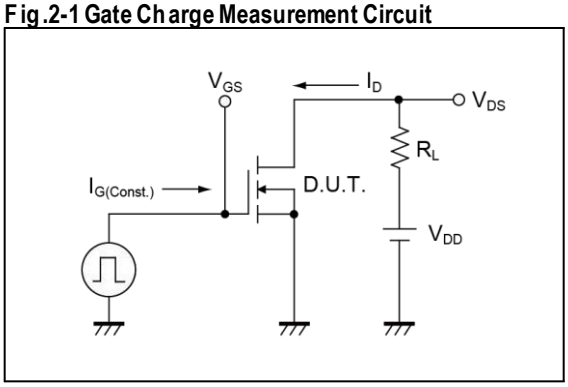


Fig.2-2 Gate Charge Waveform

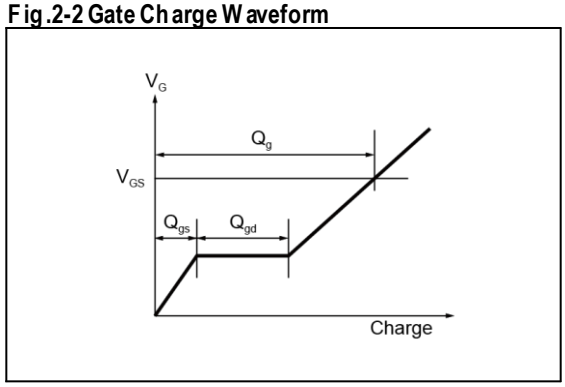


Fig.3-1 Avalanche Measurement Circuit

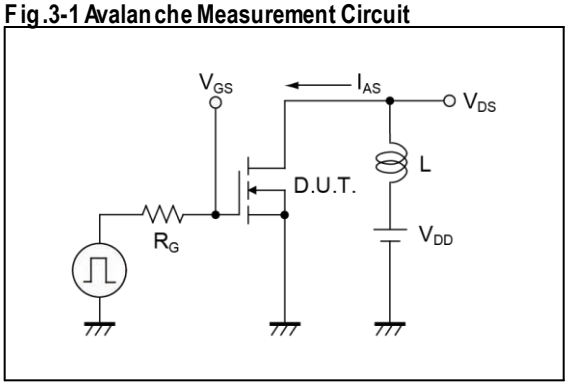
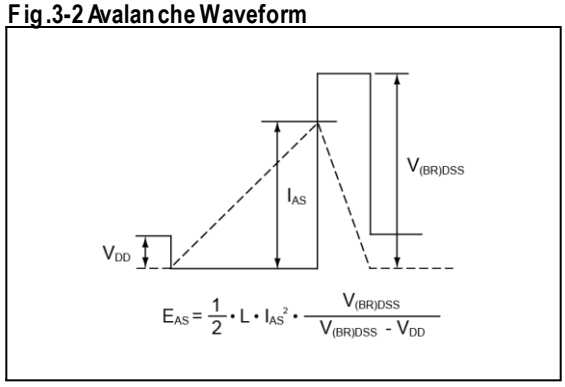


Fig.3-2 Avalanche Waveform

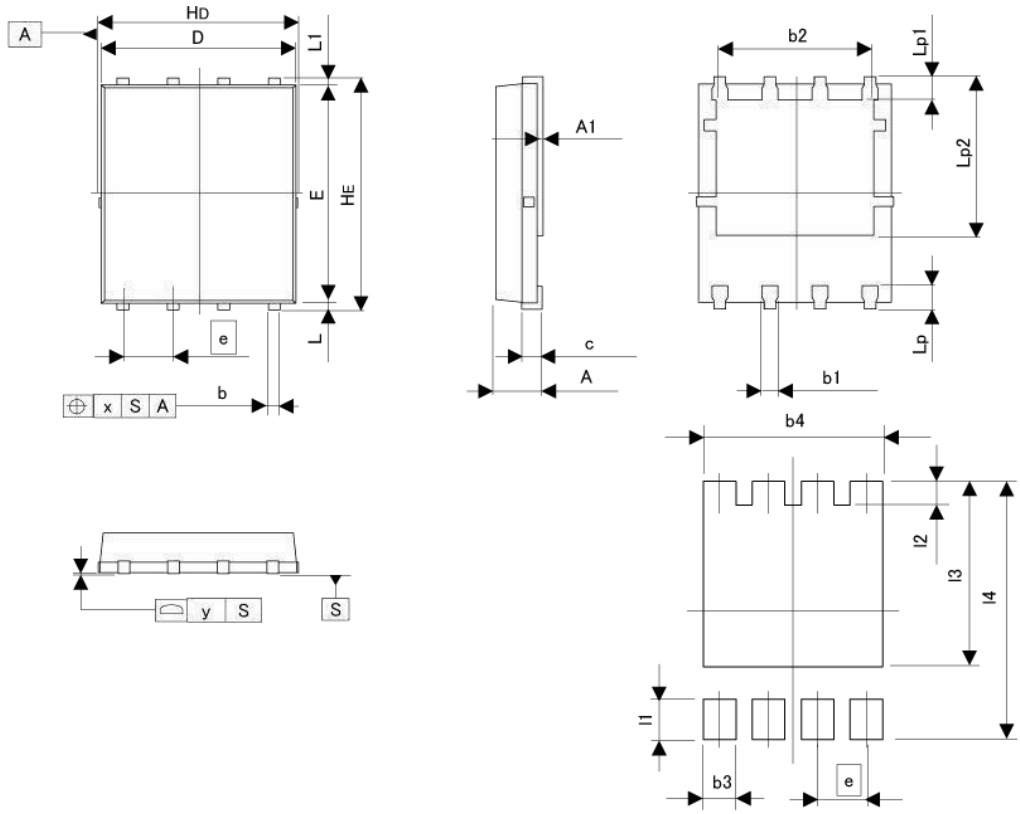


Notice

This product might cause chip aging and breakdown under the large electrified environment.
Please consider to design ESD protection circuit.

Dimensions

HSOP8 (5 x 6)



Pattern of terminal position areas
[Not a pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.10	0.035	0.043
A1	0.00	0.05	0.000	0.002
b	0.24	0.42	0.009	0.017
b1	0.29	0.49	0.011	0.019
b2	3.81	4.21	0.150	0.166
c	0.20	0.30	0.008	0.012
D	4.80	5.00	0.189	0.197
E	5.60	5.80	0.220	0.228
e	1.27		0.050	
HD	4.90	5.10	0.193	0.201
HE	5.90	6.10	0.232	0.240
L	0.07	0.25	0.003	0.010
L1	0.07	0.25	0.003	0.010
Lp	0.50	0.70	0.020	0.028
Lp1	0.52	0.72	0.020	0.028
Lp2	3.92	4.32	0.154	0.170
x	-	0.10	-	0.004
y	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b3	-	0.59	-	0.023
b4	-	4.21	-	0.166
l1	-	0.80	-	0.031
l2	-	0.82	-	0.032
l3	-	4.32	-	0.170
l4	-	6.10	-	0.240

Dimension in mm/inches