

$V_{DSS}$	30V
$R_{DS(on)}$ at 10V (Max.)	16.7m $\Omega$
$R_{DS(on)}$ at 4.5V (Max.)	22.8m $\Omega$
$I_D$	8A
$P_D$	2.0W

## ● Features

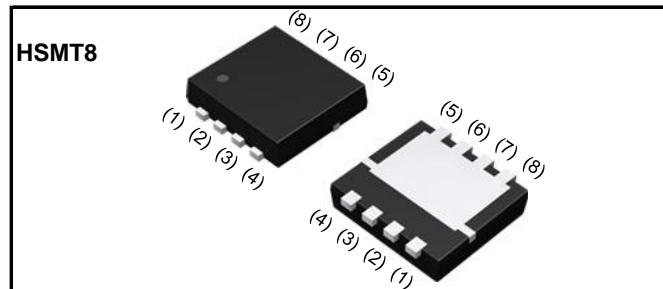
- 1) Low on - resistance.
  - 2) High Power Package (HSMT8).
  - 3) Pb-free lead plating ; RoHS compliant
  - 4) Halogen Free
  - 5) 100% Rq and UIS Tested

## ● Application

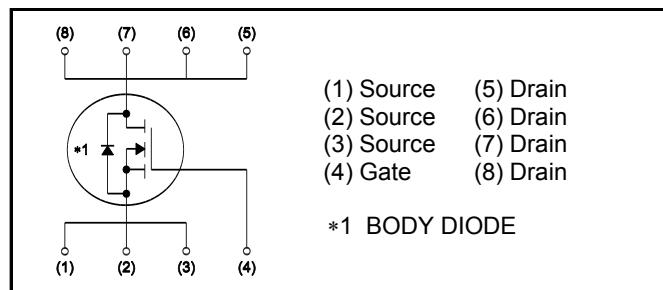
### DC/DC converters

Load switch

## ●Outline



### ● Inner circuit



## ●Packaging specifications

Type	Packaging	Taping
	Reel size (mm)	330
	Tape width (mm)	12
	Basic ordering unit (pcs)	3,000
	Taping code	TB
	Marking	E080GN

- Absolute maximum ratings ( $T_a = 25^\circ\text{C}$ ) ,unless otherwise specified

Parameter	Symbol	Value	Unit
Drain - Source voltage	$V_{DSS}$	30	V
Continuous drain current	$I_D^{*1}$	$\pm 8$	A
Pulsed drain current	$I_{D,pulse}^{*2}$	$\pm 32$	A
Gate - Source voltage	$V_{GSS}$	$\pm 20$	V
Power dissipation	$P_D^{*3}$	2.0	W
Junction temperature	$T_j$	150	°C
Range of storage temperature	$T_{stg}$	-55 to +150	°C

● Thermal resistance

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Thermal resistance, junction - ambient	$R_{thJA}$ <sup>*3</sup>	-	-	62.5	°C/W
	$R_{thJC}$	-	-	-	°C/W

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

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Drain - Source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}$ , $I_D = 1\text{mA}$	30	-	-	V
Breakdown voltage temperature coefficient	$\frac{\Delta V_{(BR)DSS}}{\Delta T_j}$	$I_D = 1\text{mA}$ referenced to $25^\circ\text{C}$	-	26.2	-	mV/°C
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 24\text{V}$ , $V_{GS} = 0\text{V}$	-	-	1	μA
Gate - Source leakage current	$I_{GSS}$	$V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$	-	-	$\pm 100$	nA
Gate threshold voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$ , $I_D = 1\text{mA}$	1.2	-	2.5	V
Gate threshold voltage temperature coefficient	$\frac{\Delta V_{(GS)\text{th}}}{\Delta T_j}$	$I_D = 1\text{mA}$ referenced to $25^\circ\text{C}$	-	-4.0	-	mV/°C
Static drain - source on - state resistance	$R_{DS(\text{on})}$ <sup>*4</sup>	$V_{GS} = 10\text{V}$ , $I_D = 8\text{A}$	-	12.9	16.7	mΩ
		$V_{GS} = 4.5\text{V}$ , $I_D = 8\text{A}$	-	17.5	22.8	
Gate input resistannce	$R_G$	f = 1MHz, open drain	-	2.5	-	Ω
Transconductance	$g_{fs}$ <sup>*4</sup>	$V_{DS} = 5\text{V}$ , $I_D = 8\text{A}$	7.0	-	-	S

\*1 Limited only by maximum temperature allowed.

\*2 Pw ≤ 10μs, Duty cycle ≤ 1%

\*3 Mounted on a Ceramic Board (30×30×0.8mm)

\*4 Pulsed

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

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Input capacitance	$C_{iss}$	$V_{GS} = 0\text{V}$ $V_{DS} = 15\text{V}$ $f = 1\text{MHz}$	-	295	-	pF
Output capacitance	$C_{oss}$		-	89	-	
Reverse transfer capacitance	$C_{rss}$		-	24	-	
Turn - on delay time	$t_{d(on)}^{*4}$	$V_{DD} \approx 15\text{V}, V_{GS} = 10\text{V}$ $I_D = 4\text{A}$ $R_L = 3.75\Omega$ $R_G = 10\Omega$	-	6.9	-	ns
Rise time	$t_r^{*4}$		-	3.6	-	
Turn - off delay time	$t_{d(off)}^{*4}$		-	17.3	-	
Fall time	$t_f^{*4}$		-	2.4	-	

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

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Total gate charge	$Q_g^{*4}$	$V_{DD} \approx 15\text{V}, I_D=8\text{A}$ $V_{GS} = 10\text{V}$	-	5.8	-	nC
		$V_{DD} \approx 15\text{V}, I_D=8\text{A}$ $V_{GS} = 4.5\text{V}$	-	2.8	-	
Gate - Source charge	$Q_{gs}^{*4}$	$V_{GS} = 4.5\text{V}$	-	1.4	-	
Gate - Drain charge	$Q_{gd}^{*4}$		-	0.7	-	

● 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	$I_S^{*1}$	$T_a = 25^\circ\text{C}$	-	-	1.67	A
Forward voltage	$V_{SD}^{*4}$	$V_{GS} = 0\text{V}, I_s = 1.67\text{A}$	-	-	1.2	V
Reverse recovery time	$t_{rr}^{*4}$	$I_S = 8\text{A}$ $di/dt = 100\text{A}/\mu\text{s}$	-	16.8	-	ns
Reverse recovery charge	$Q_{rr}^{*4}$		-	8.1	-	nC

## ● Electrical characteristic curves

Fig.1 Power Dissipation Derating Curve

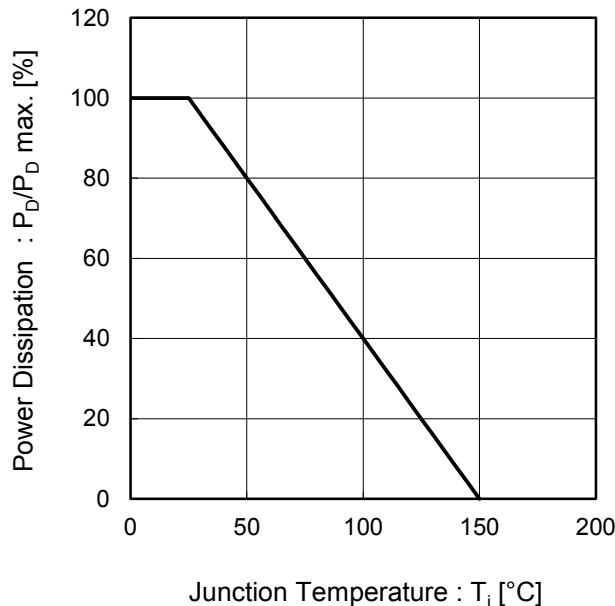


Fig.2 Maximum Safe Operating Area

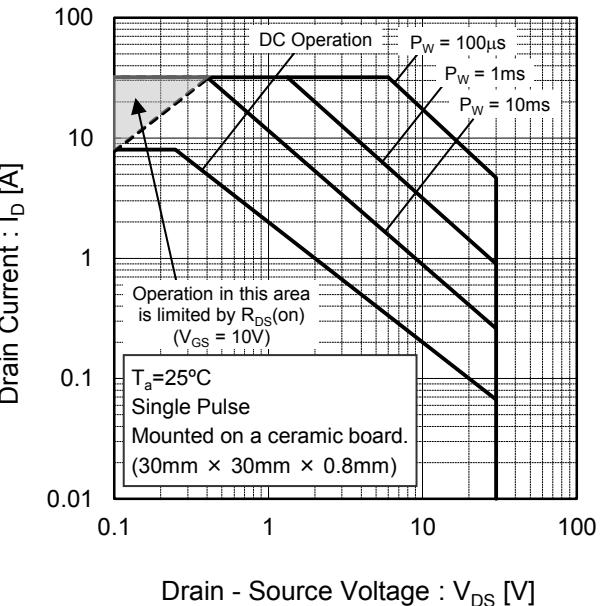


Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width

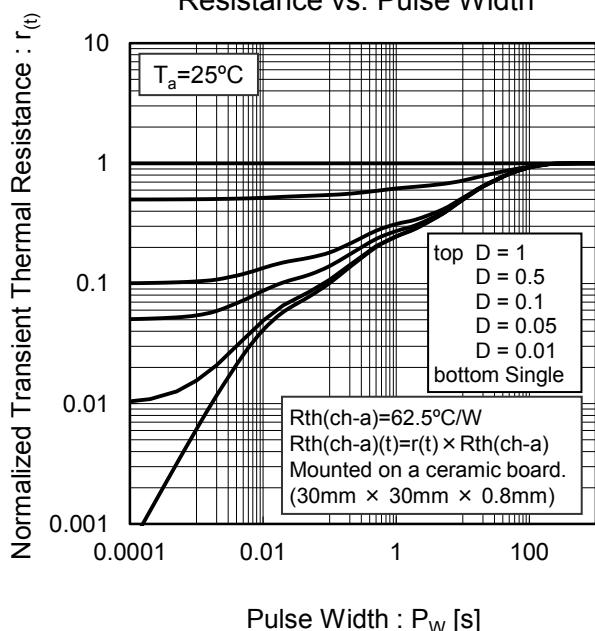
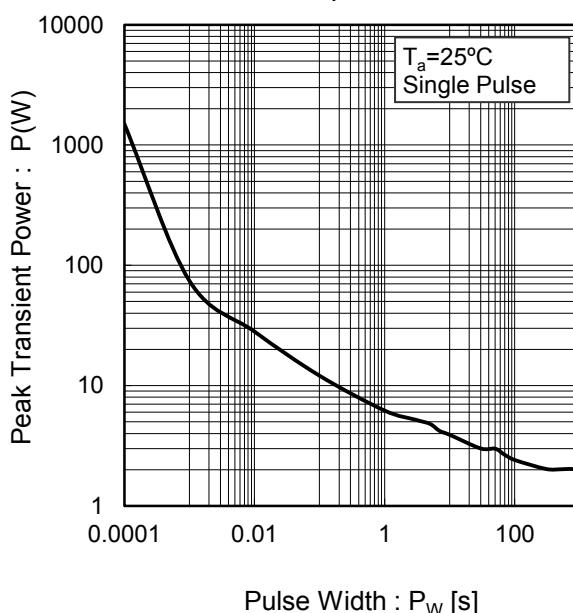


Fig.4 Single Pulse Maximum Power dissipation



● Electrical characteristic curves

Fig.5 Typical Output Characteristics(I)

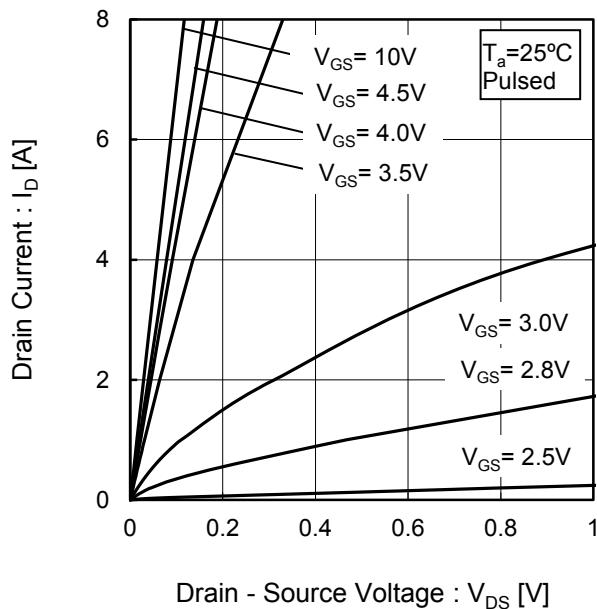


Fig.6 Typical Output Characteristics(II)

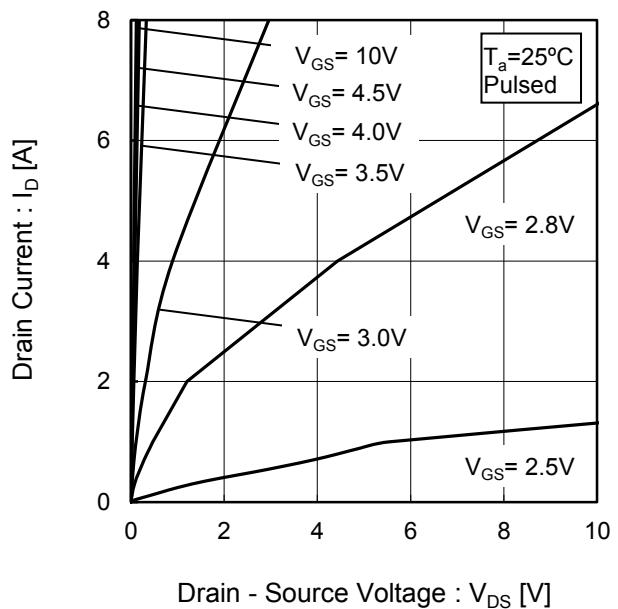


Fig.7 Breakdown Voltage vs. Junction Temperature

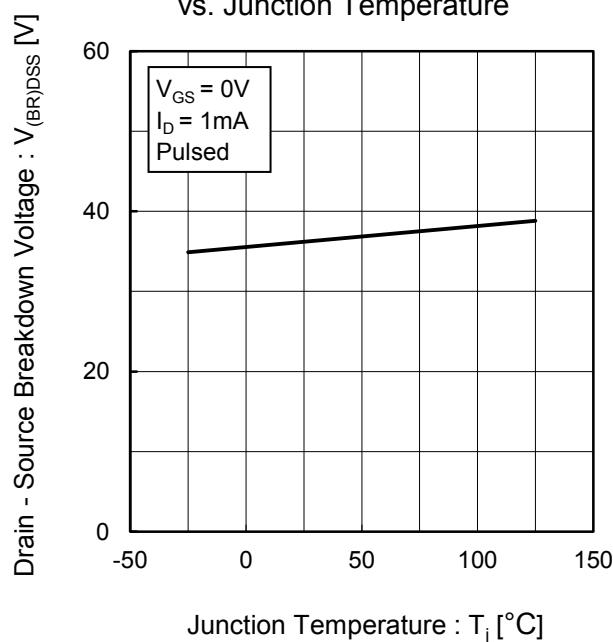
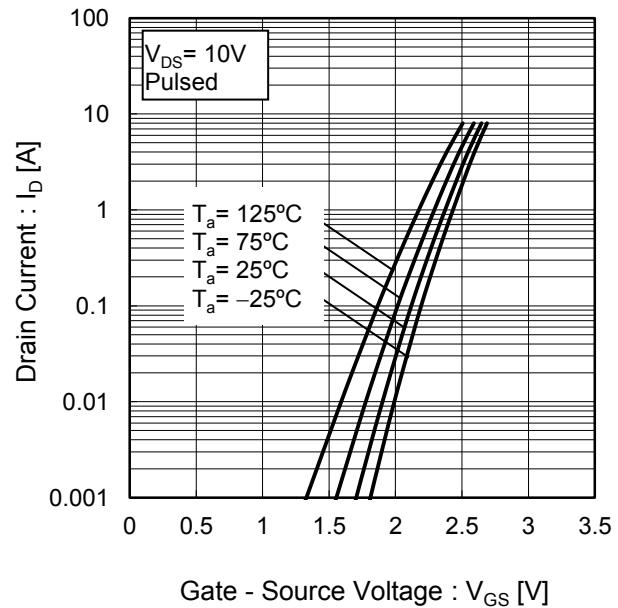


Fig.8 Typical Transfer Characteristics



● Electrical characteristic curves

Fig.9 Gate Threshold Voltage vs. Junction Temperature

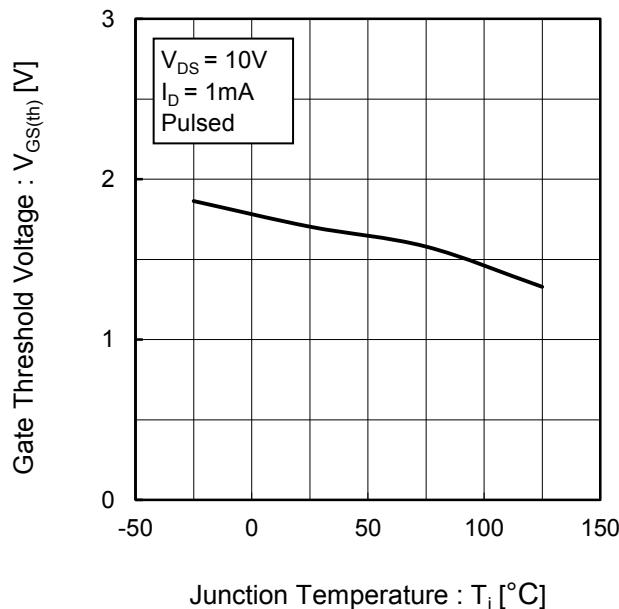


Fig.10 Transconductance vs. Drain Current

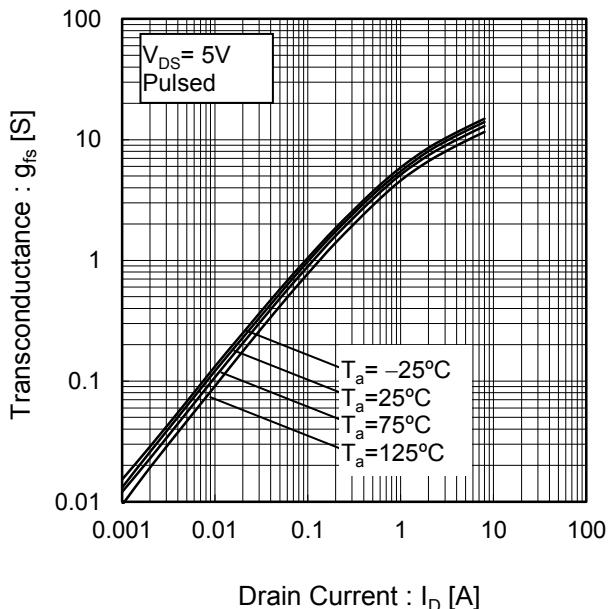


Fig.11 Drain Current Derating Curve

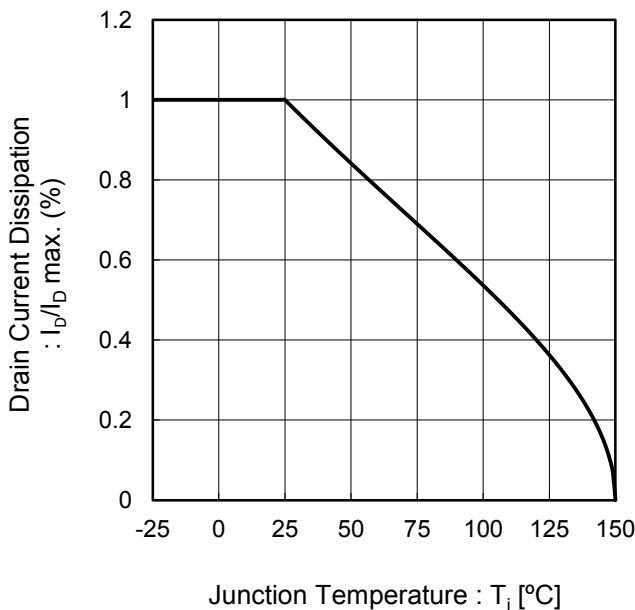
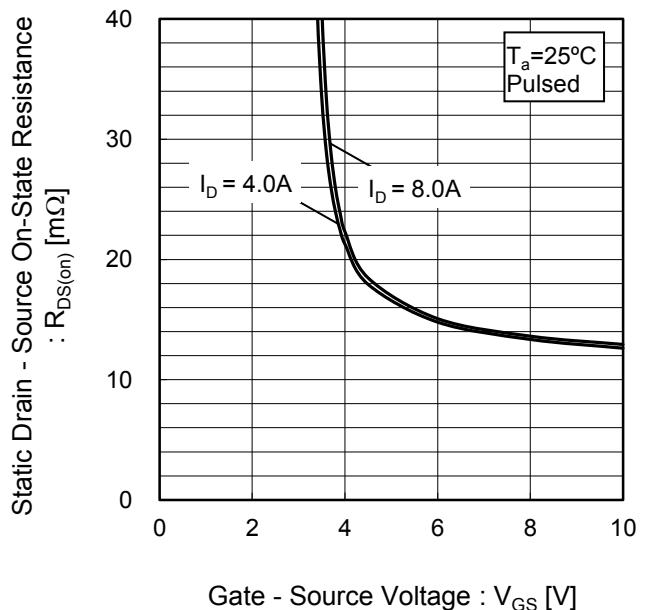


Fig.12 Static Drain - Source On - State Resistance vs. Gate Source Voltage



● Electrical characteristic curves

Fig.13 Static Drain - Source On - State Resistance vs. Drain Current(I)

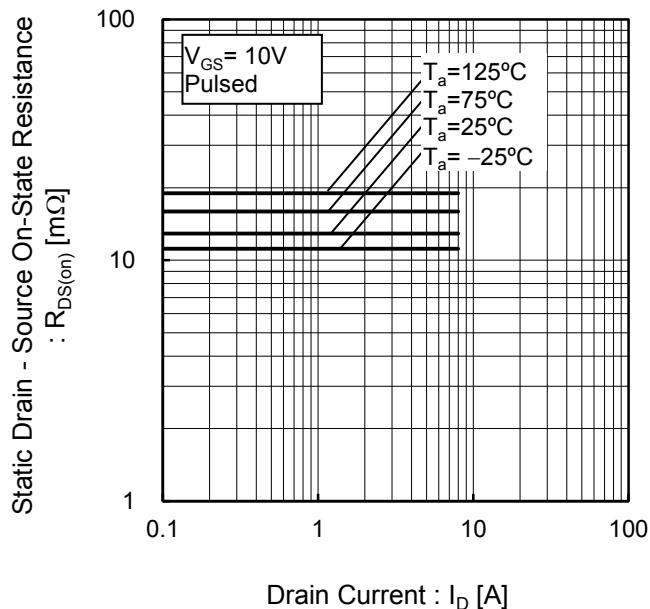


Fig.14 Static Drain - Source On - State Resistance vs. Junction Temperature

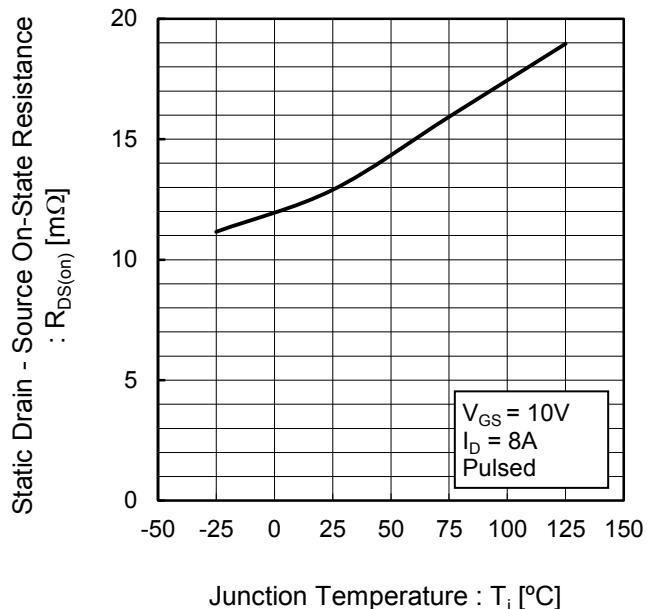
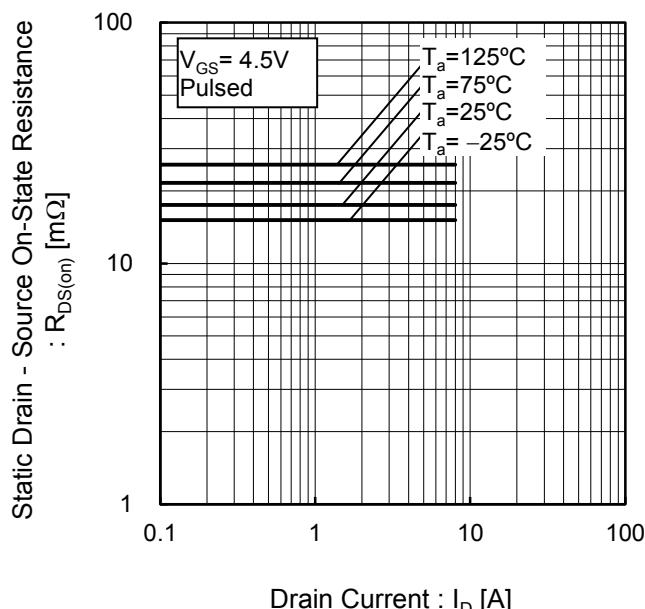


Fig.15 Static Drain - Source On - State Resistance vs. Drain Current(II)



● Electrical characteristic curves

Fig.16 Typical Capacitance  
vs. Drain - Source Voltage

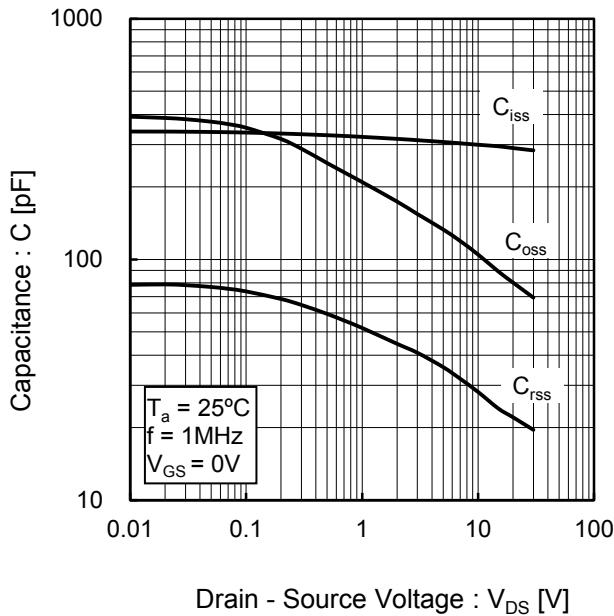


Fig.17 Switching Characteristics

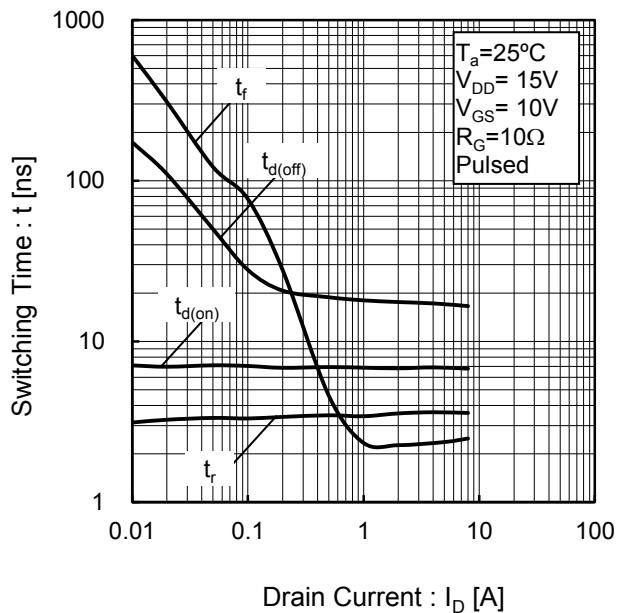


Fig.18 Dynamic Input Characteristics

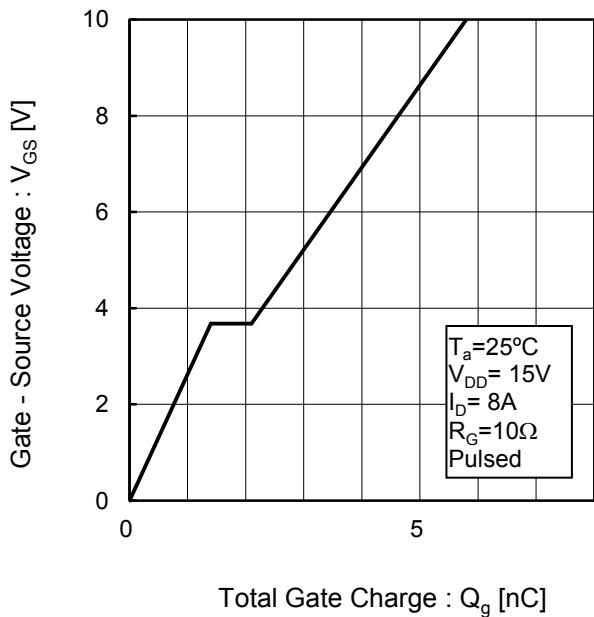
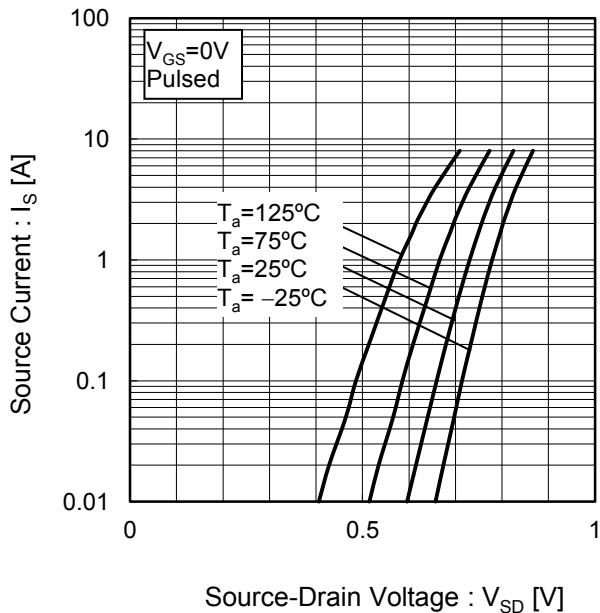


Fig.19 Source Current  
vs. Source Drain Voltage



## ●Measurement circuits

Fig.1-1 Switching Time Measurement Circuit

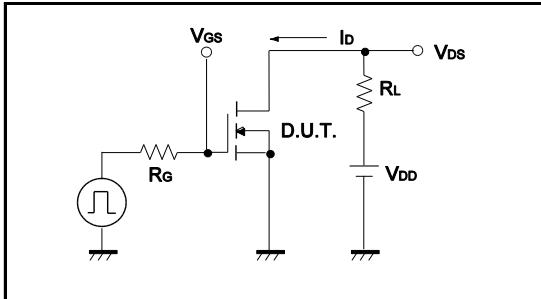


Fig.1-2 Switching Waveforms

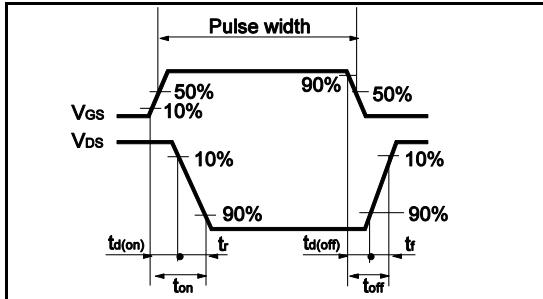


Fig.2-1 Gate Charge Measurement Circuit

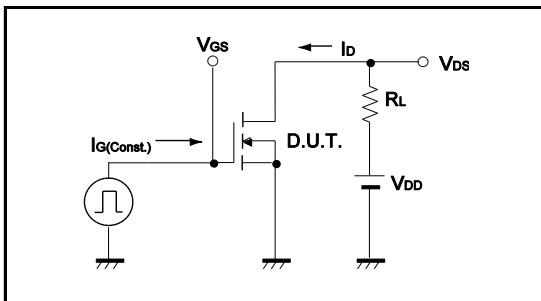
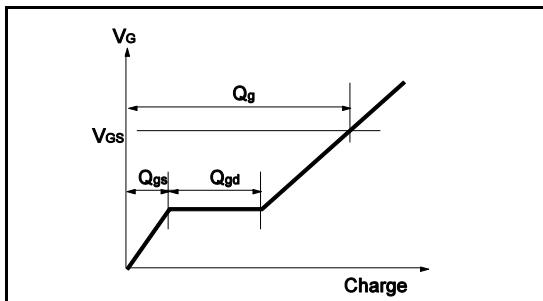
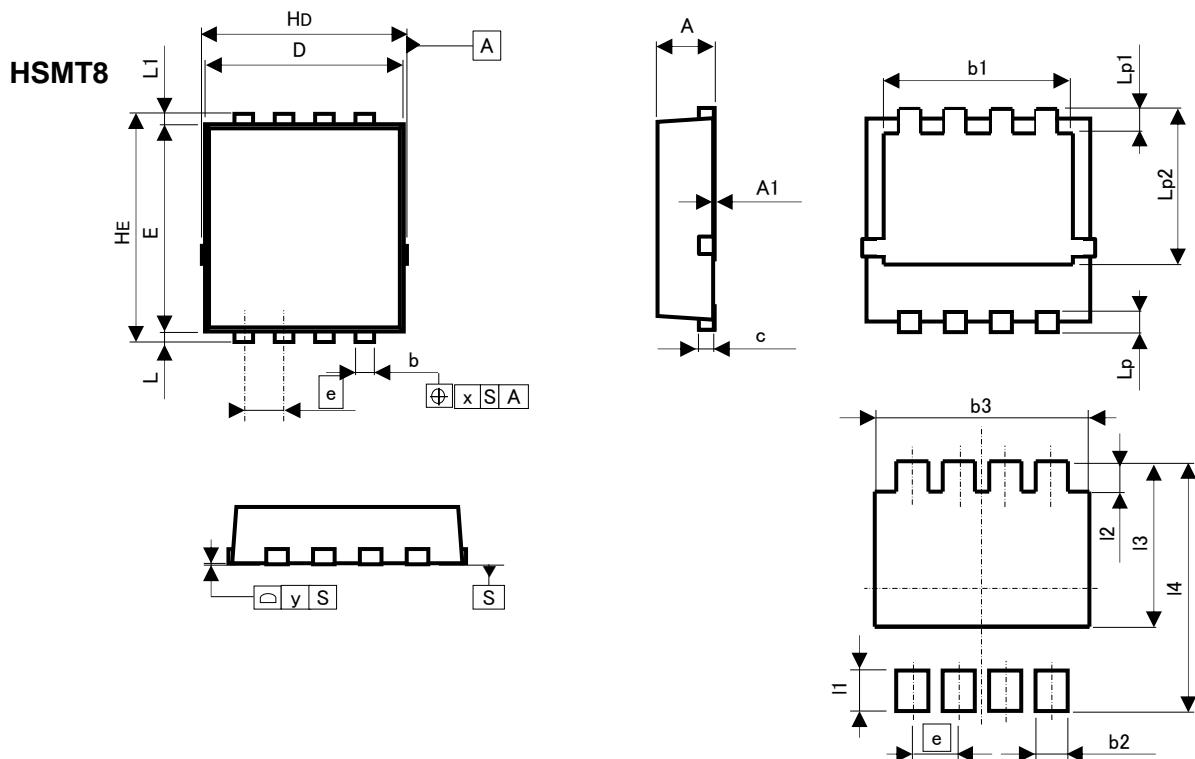


Fig.2-2 Gate Charge Waveform



●Dimensions (Unit : mm)



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

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.70	0.90	0.028	0.035
A1	0.00	0.05	0.000	0.002
b	0.27	0.37	0.011	0.015
b1	2.50	2.70	0.098	0.106
c	0.10	0.30	0.004	0.012
D	3.10	3.30	0.122	0.130
E	2.90	3.10	0.114	0.122
e	0.65		0.026	
HD	3.20	3.40	0.126	0.134
HE	3.20	3.40	0.126	0.134
L	0.07	0.25	0.003	0.010
L1	0.07	0.25	0.003	0.010
Lp	0.20	0.40	0.008	0.016
Lp1	0.25	0.45	0.010	0.018
Lp2	2.20	2.40	0.087	0.094
x	-	0.10	-	0.004
y	-	0.10	-	0.004

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.47	-	0.019
b3	-	2.70	-	0.106
I1	-	0.50	-	0.020
I2	-	0.55	-	0.022
I3	-	2.40	-	0.094
I4	-	3.40	-	0.134

Dimension in mm/inches

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