

## 20V, 20mΩ, 6A, N-Channel Enhancement Mode Power MOSFET

### 1.Features

- ◆ High Power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface Mount Package

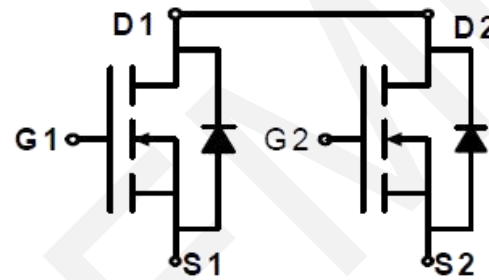
V <sub>DS</sub> Typ.	R <sub>DS(on)</sub> Typ.	I <sub>D</sub> Max.
20V	20mΩ @ 4.5V	6A
	25mΩ @ 2.5V	

### 2.Applications

- ◆ Battery Protection
- ◆ Battery Powered Systems
- ◆ Power Management in Notebook Computer
- ◆ Portable Equipment



TSSOP8  
Pin Description



Schematic Diagram

### 3.Absolute Max Ratings at Ta=25°C (Note1)

Parameter	Symbol	Maximum	Units
Drain to Source Voltage	V <sub>DSS</sub>	20	V
Gate to Source Voltage	V <sub>GSS</sub>	±12	V
Drain Current-Continuous	I <sub>D</sub>	6	A
Drain Current (Pulse)	I <sub>DM</sub>	16	A
Maximum Power Dissipation	P <sub>D</sub>	1.6	W
Operating Junction and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 to +150	°C
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)	T <sub>L</sub>	260	°C

Note 1: Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

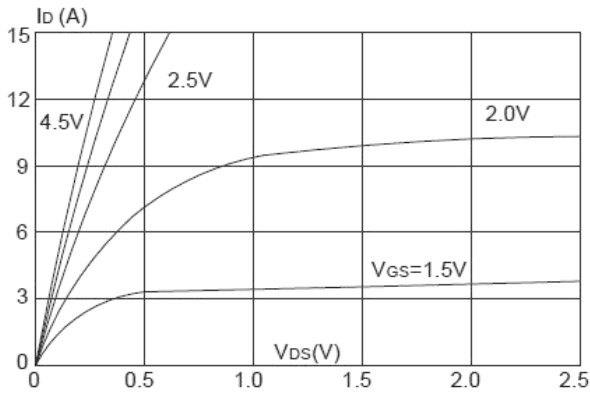
**4. Electrical Characteristics at Ta=25°C (Note 2)**

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	20	21		V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 18V, V_{GS} = 0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 12V, V_{DS} = 0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.5	0.65	1.2	V
Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 6A, V_{GS} = 4.5V$		20	23	m $\Omega$
		$I_D = 2A, V_{GS} = 2.5V$		25	28	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{GS}=0V,$ $V_{DS}=10V,$ Frequency=1.0MHz		358		pF
Output Capacitance	$C_{oss}$			69		pF
Reverse Transfer Capacitance	$C_{riss}$			59		pF
Turn-ON Delay Time	$t_{d(on)}$			16		ns
Turn-ON Rise Time	$t_r$	$V_{DD} = 10V, I_D = 6A,$ $V_{GS} = 4.5V,$ $R_{GEN} = 3\Omega$		51		ns
Turn-OFF Delay Time	$t_{d(off)}$			21		ns
Turn-ON Fall Time	$t_f$			19		ns
Total Gate Charge	$Q_g$				5.6	
Gate-Source Charge	$Q_{gs}$	$V_{DS} = 10V,$ $V_{GS} = 4.5V,$ $I_D = 3A$		0.8		nC
Gate-Drain Charge	$Q_{gd}$			1		nC
Diode Forward Voltage	$V_{SD}$		$I_d = 6A, V_{GS} = 0V$		0.9	1.2

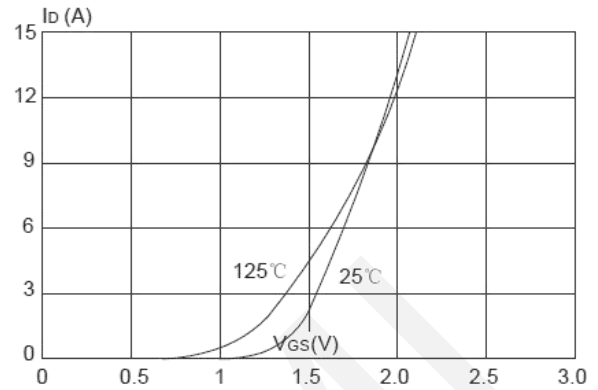
Note 2 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



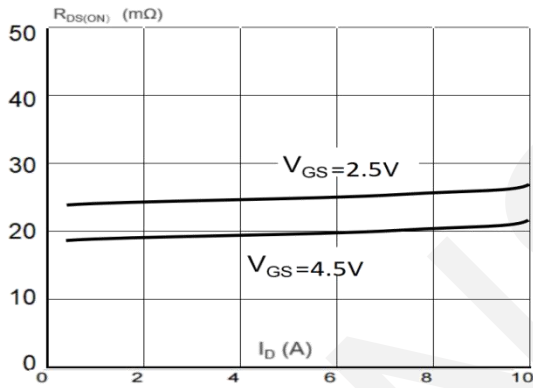
### 5. Typical electrical and thermal characteristics



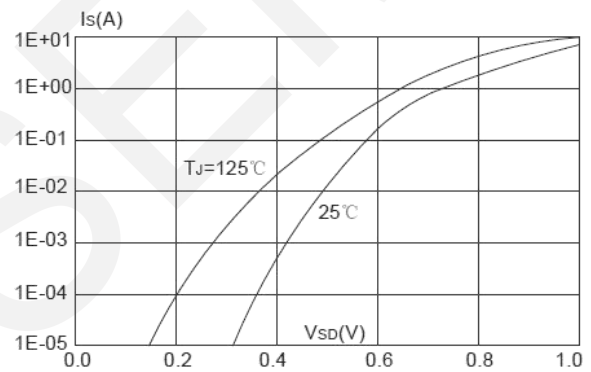
Output Characteristics



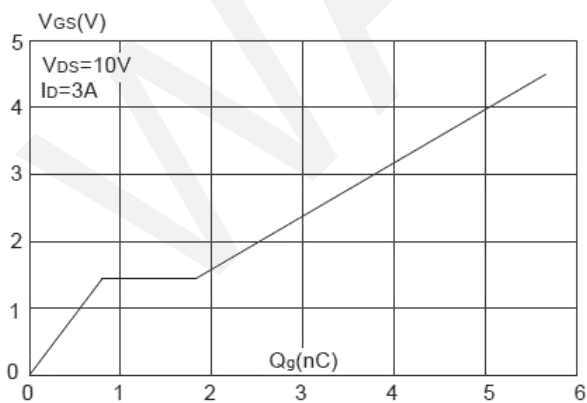
Typical Transfer Characteristics



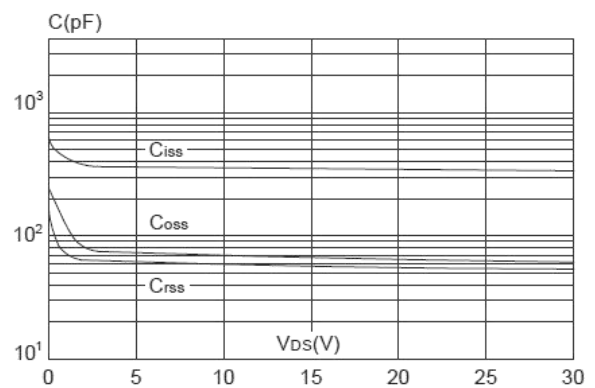
On-resistance vs. Drain Current



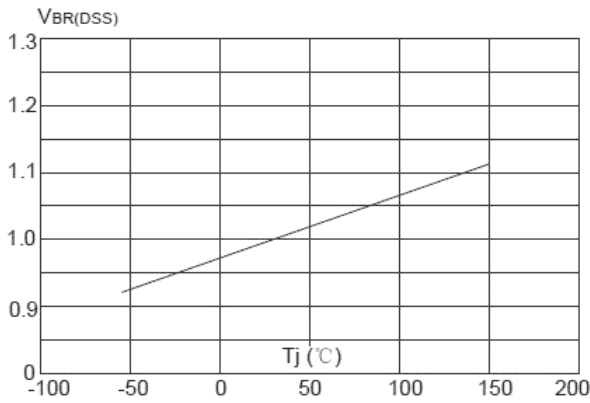
Body Diode Characteristics



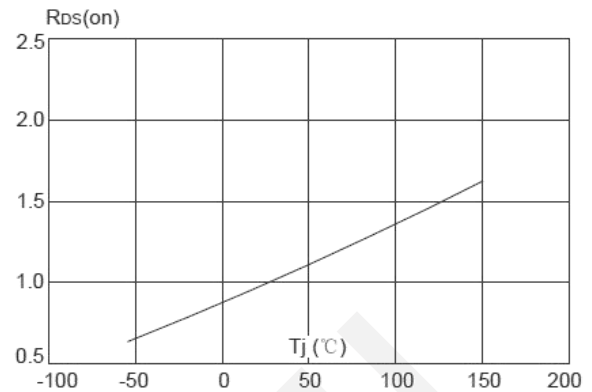
Gate Charge Characteristics



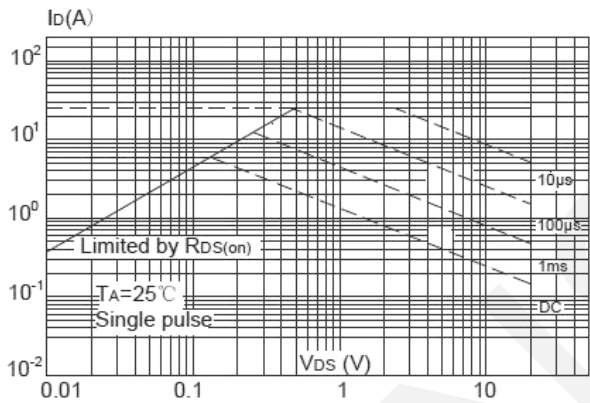
Capacitance Characteristics



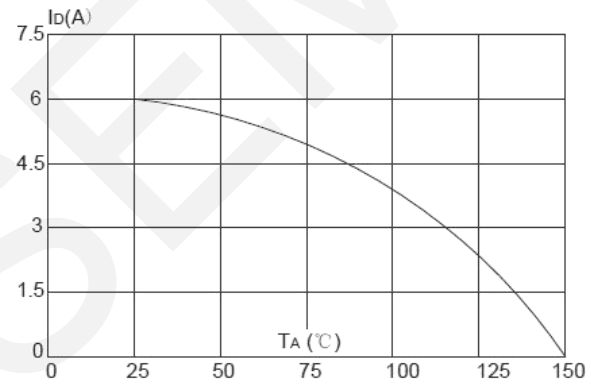
Normalized Breakdown Voltage vs. Junction Temperature



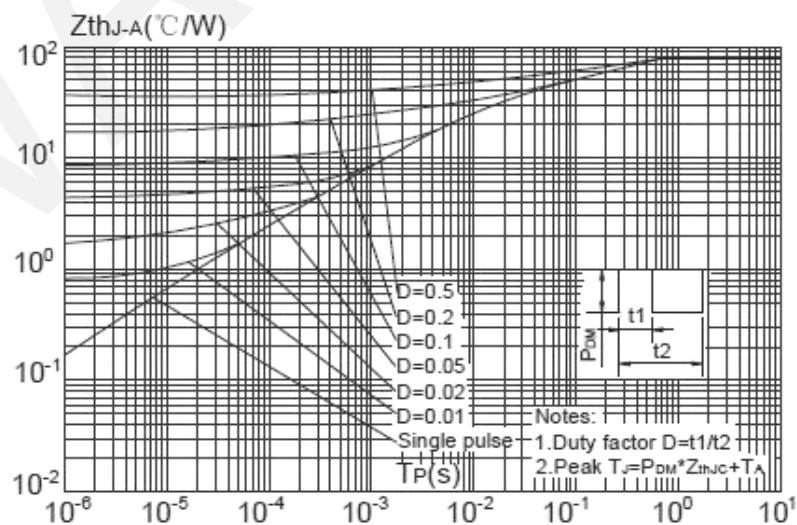
Normalized on Resistance vs. Junction Temperature



Maximum Safe Operating Area



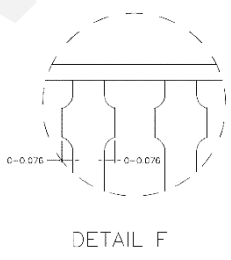
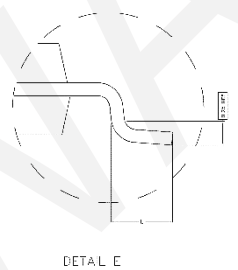
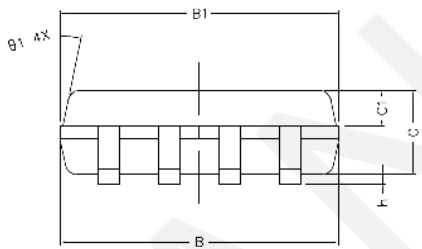
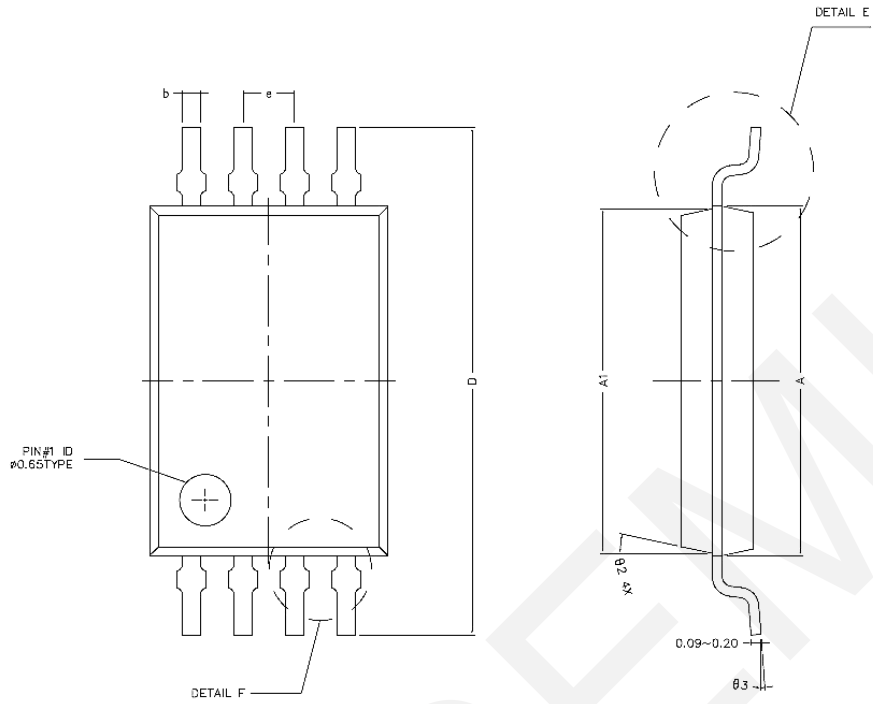
Maximum Continuous Drain Current vs. Ambient Temperature



Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



**6.Package Dimensions**



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	4.300	4.400	4.500
A1	4.240	4.340	4.440
B	2.900	3.000	3.100
B1	2.840	2.940	3.040
C	0.850	0.900	0.950
C1	0.337	0.387	0.437
D	6.250	6.400	6.550
L	0.450	0.600	0.750
b	0.170	0.220	0.300
h	0.050	0.100	0.150
e	0.650TYPE		
θ <sub>1</sub>	12° TYPE		
θ <sub>2</sub>	12° TYPE		
θ <sub>3</sub>	0° ~ 7°		

## 7.Important Notice

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