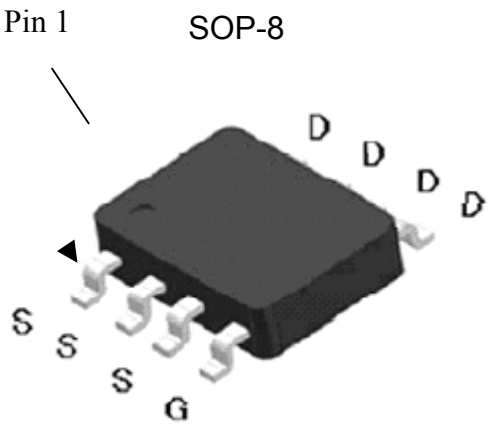
N-Channel Enhancement Mode Power MOSFET

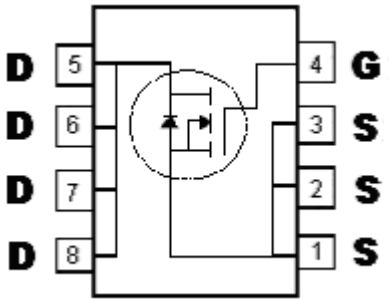
Features:

- Single Drive Requirement
- Low On-resistance
- Fast Switching Characteristic
- Repetitive Avalanche Rated
- Pb-free & Halogen-free package



Description:

The KSC7451 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



G：Gate
D：Drain
S：Source

BV_{DSS}	**150V**
I_D @ T_A=25°C, V_{GS}=10V	**4.5A**
$R_{DS(ON)}$@V_{GS}=10V, I_D=4.5A	**55 mΩ (typ)**
$R_{DS(ON)}$@V_{GS}=6V, I_D=3.3A	**59 mΩ (typ)**
$R_{DS(ON)}$@V_{GS}=5V, I_D=2A	**65 mΩ (typ)**

Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current @ T_A=25°C, V_{GS}=10V		I_D	4.5	A
Continuous Drain Current @ T_A=100°C, V_{GS}=10V			2.8	
Pulsed Drain Current		I_{DM}	20 *1	
Avalanche Current		I_{AS}	4.5	
Avalanche Energy @ L=10mH, I_D=4.5A, R_G=25Ω		E_{AS}	100	mJ
Repetitive Avalanche Energy @ L=0.05mH		E_{AR}	1.6 *2	
Total Power Dissipation	T_A=25 °C	P_D	3.1	W
	T_A=100 °C		1.2	
Operating Junction and Storage Temperature		Tj, Tstg	-55~+150	°C

Note : *1. Pulse width limited by maximum junction temperature
*2. Duty cycle ≤ 1%

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case	$R_{th,j-c}$	25	°C/W
Thermal Resistance, Junction-to-ambient (Note)	$R_{th,j-a}$	40	

Note : 40℃ / W when mounted on a 1 in^2 pad of 2 oz copper, t≤10s; 125 ˚C/W when mounted on minimum pad.

Characteristics (T_C=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	150	-	-	v	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	2.0	-	4.0		V_{DS} = V_{GS}, I_D=250μA
G_{FS}	-	9	-	S	V_{DS} =10V, I_D=2.2A
I_{GSS}	-	-	±100	nA	V_{GS}=±30V
I_{DSS}	-	-	1	μA	V_{DS} =120V, V_{GS} =0V
	-	-	25		V_{DS} =120V, V_{GS} =0V, Tj=125°C
*$R_{DS(ON)}$	-	55	73	mΩ	V_{GS} =10V, I_D=4.5A
	-	59	78		V_{GS} =6V, I_D=3.3A
	-	65	85		V_{GS} =5V, I_D=2A
Dynamic					
Qg *1, 2	-	24	-	nC	V_{DS}=75V,I_D=4.5A, V_{GS}=10V
Qgs *1, 2	-	5.3	-		
Qgd *1, 2	-	7.8	-		
Ciss	-	1284	-	pF	V_{DS}=25V, V_{GS}=0V, f=1MHz
Coss	-	128	-		
Crss	-	56	-		

Characteristics (Cont. T_C=25°C, unless otherwise specified)

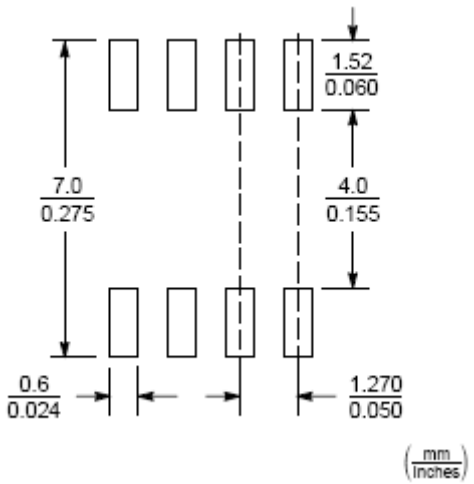
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Dynamic					
$t_{d(ON)}$ *1, 2	-	14.4	-	ns	V_{DS}=75V, I_D=1A, V_{GS}=10V, R_G=3Ω
tr *1, 2	-	18	-		
$t_{d(OFF)}$ *1, 2	-	35.2	-		
t_f *1, 2	-	23	-		
Source-Drain Diode Ratings and Characteristics					
I_S *1	-	-	2.3	A	
I_{SM} *3	-	-	9.2		
V_{SD} *1	-	0.78	1.2	V	I_F=2.3A, V_{GS}=0V
trr	-	39	-	ns	I_F=2.3A, dI_F/dt=100A/μs
Qrr	-	68	-	nC	

Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

Ordering Information

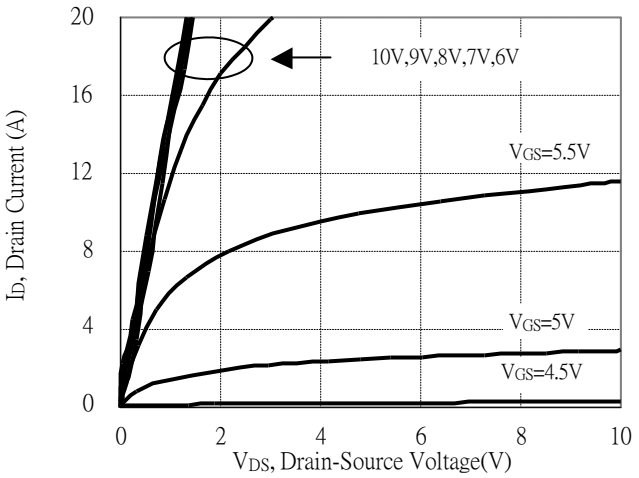
Device	Package	Shipping
KSC7451	SOP-8 (RoHS compliant & Halogen-free package)	2500 pcs / Tape & Reel

Recommended Soldering Footprint

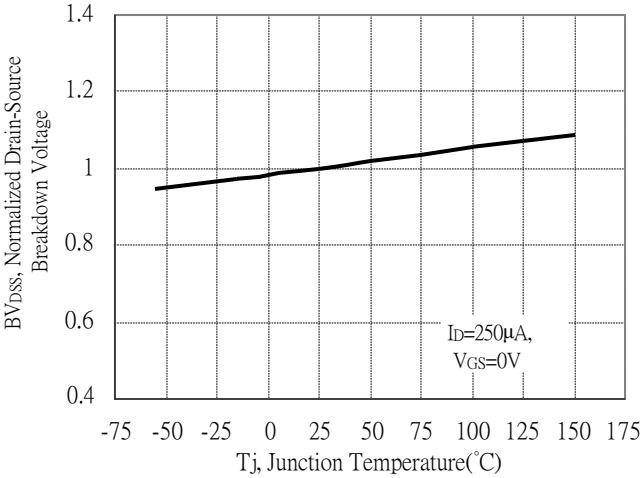


Typical Characteristics

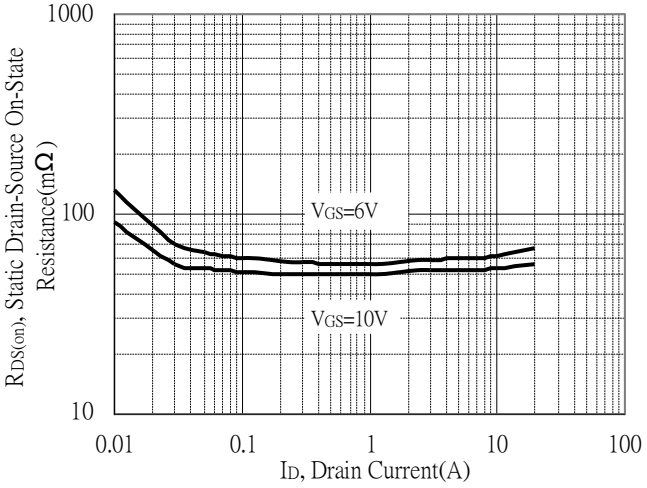
Typical Output Characteristics



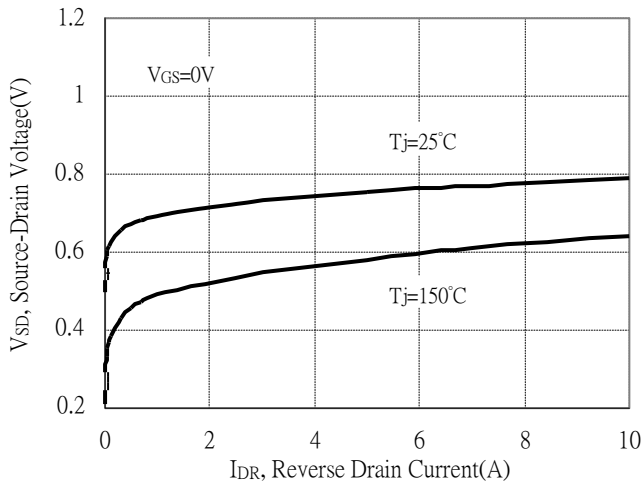
Brekdown Voltage vs Ambient Temperature



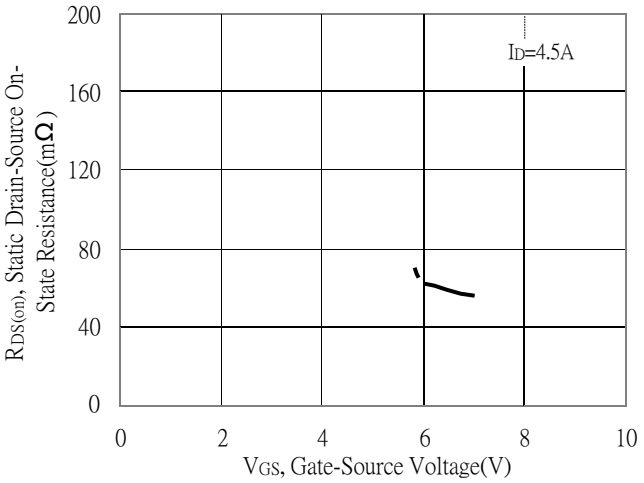
Static Drain-Source On-State resistance vs Drain Current



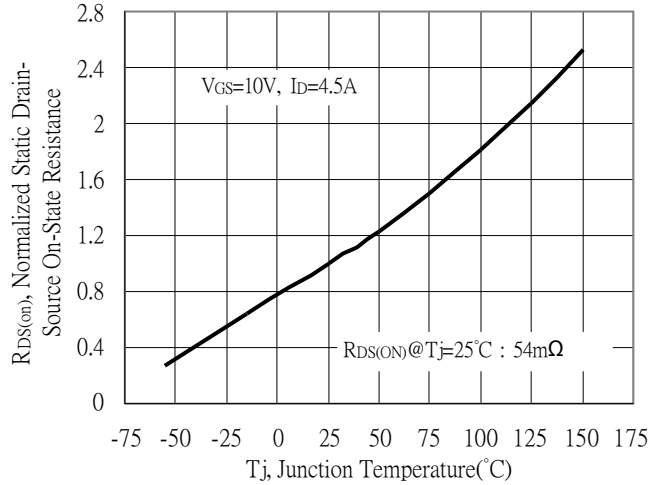
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

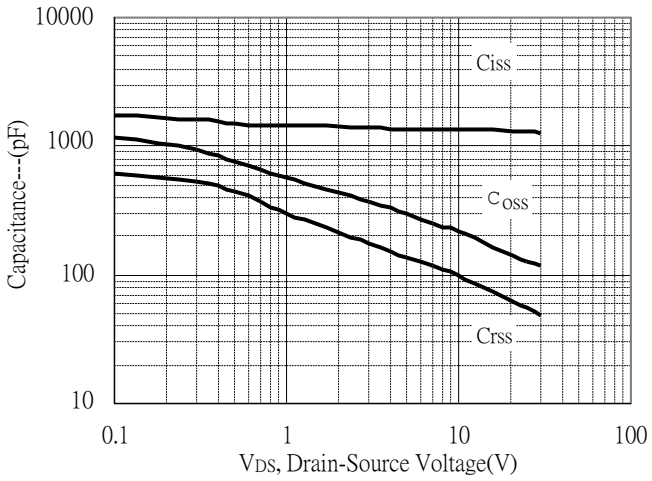


Drain-Source On-State Resistance vs Junction Tempearture

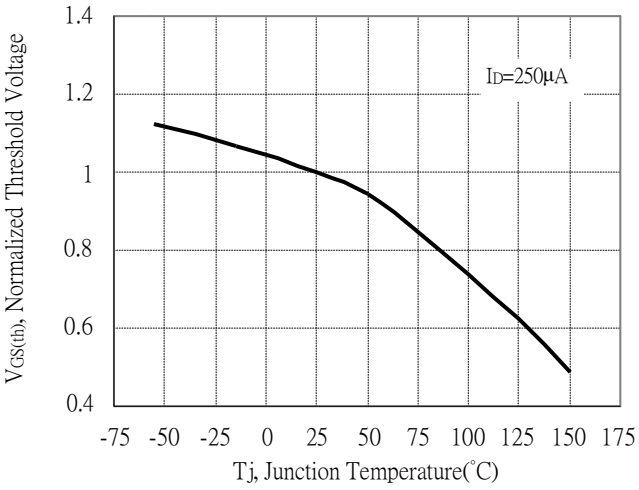


Typical Characteristics(Cont.)

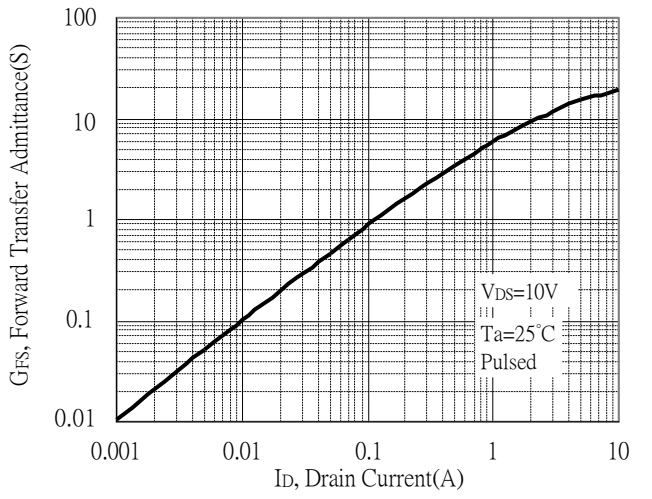
Capacitance vs Drain-to-Source Voltage



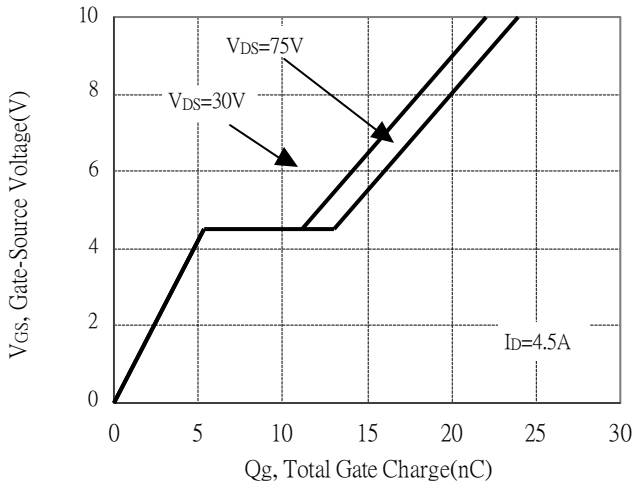
Threshold Voltage vs Junction Tempearture



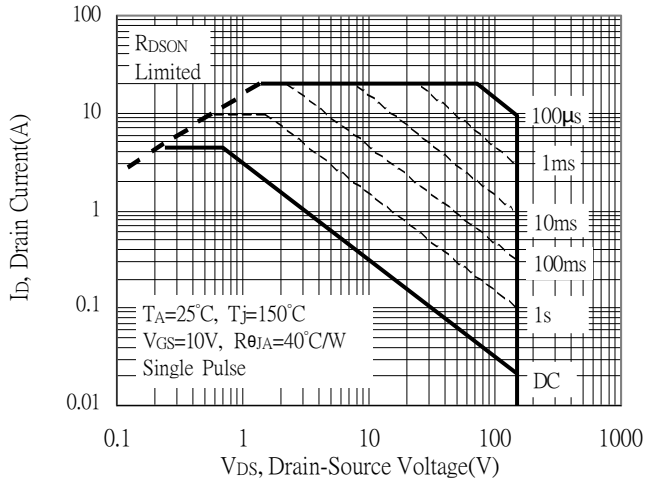
Forward Transfer Admittance vs Drain Current



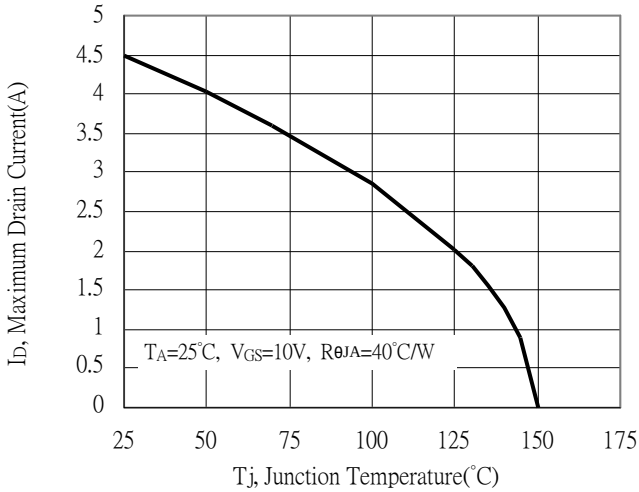
Gate Charge Characteristics



Maximum Safe Operating Area

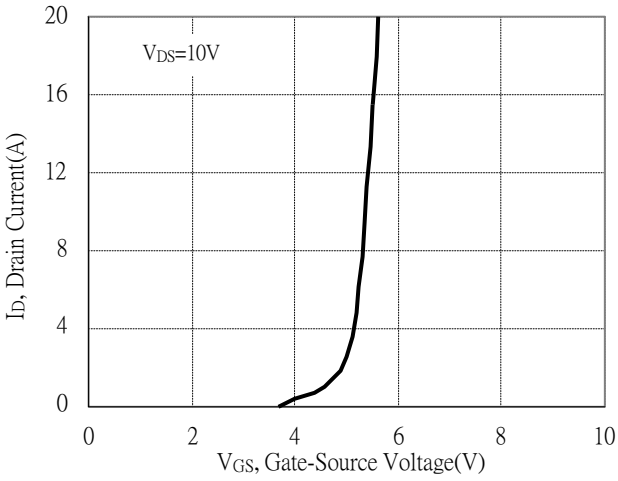


Maximum Drain Current vs Junction Temperature

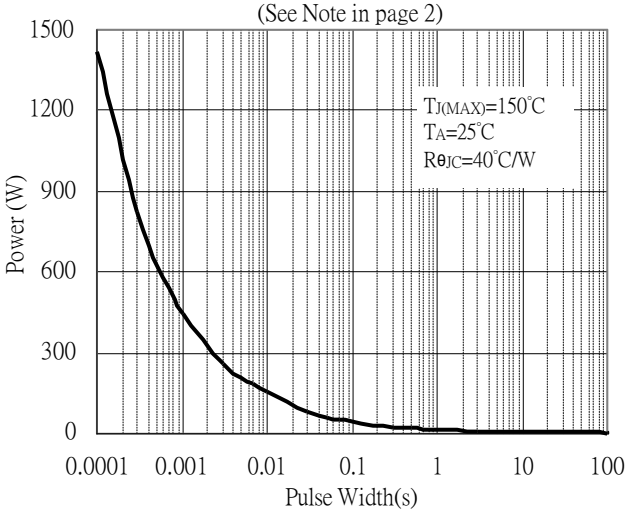


Typical Characteristics(Cont.)

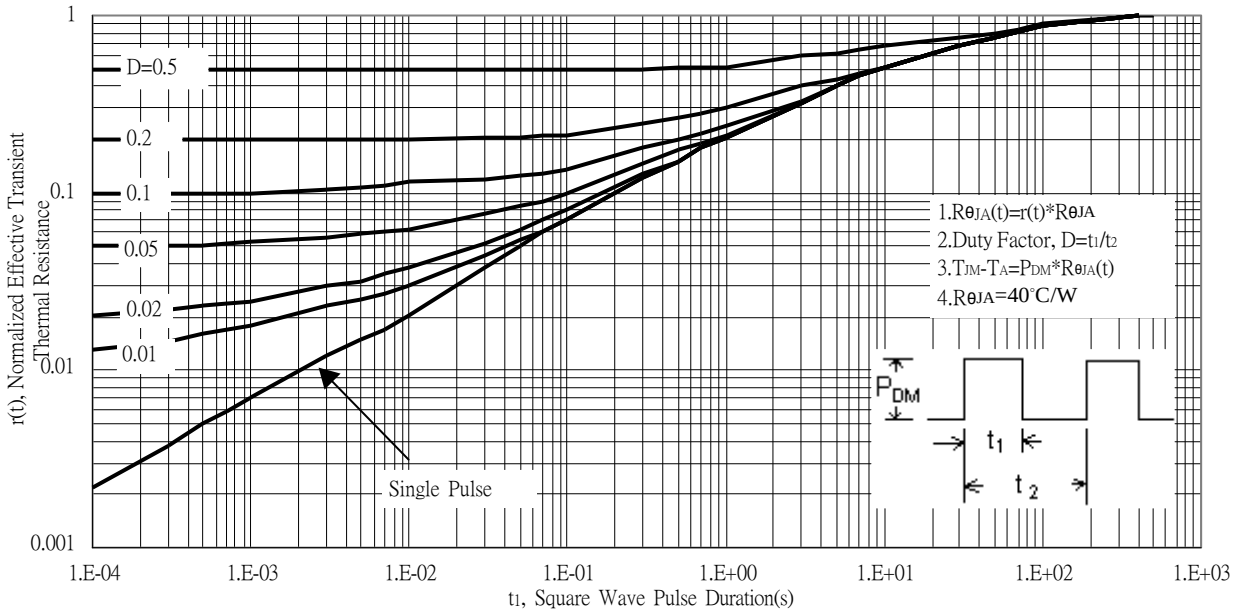
Typical Transfer Characteristics



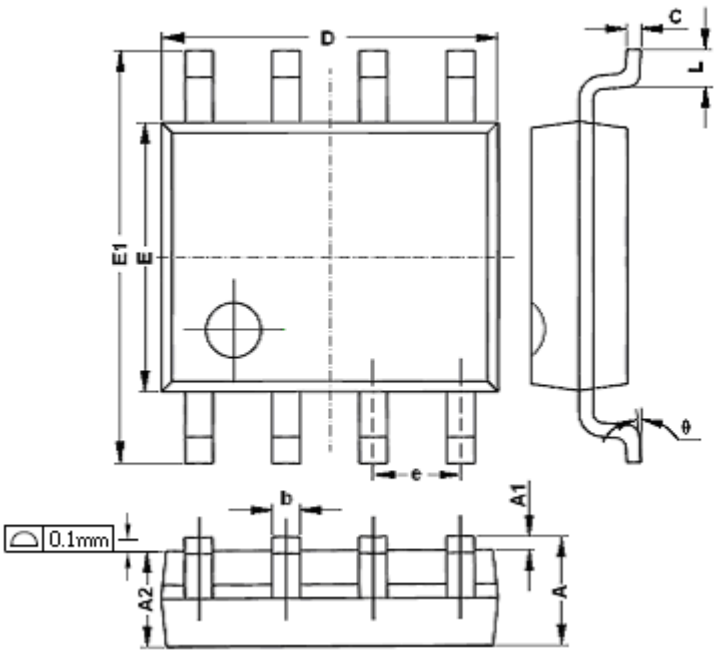
Single Pulse Power Rating, Junction to Ambient
(See Note in page 2)



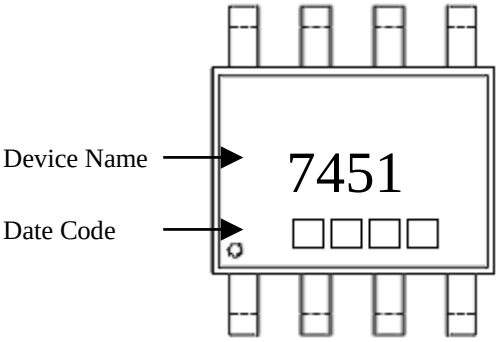
Transient Thermal Response Curves



SOP-8 Dimension



Marking:



Date Code(counting from left to right) :
1st code: year code, the last digit of Christian year
2nd code : month code, Jan→A, Feb→B, Mar→C, Apr→D
May→E, Jun→F, Jul→G, Aug→H, Sep→J, Oct
→K, Nov→L, Dec→M
3rd and 4th codes : prodcution serial number, 01~99

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069	E	3.800	4.000	0.150	0.157
A1	0.100	0.250	0.004	0.010	E1	5.800	6.200	0.228	0.244
A2	1.350	1.550	0.053	0.061	e	1.270 (BSC)		0.050 (BSC)	
b	0.330	0.510	0.013	0.020	L	0.400	1.270	0.016	0.050
c	0.170	0.250	0.006	0.010	θ	0	8°	0	8°
D	4.700	5.100	0.185	0.200					