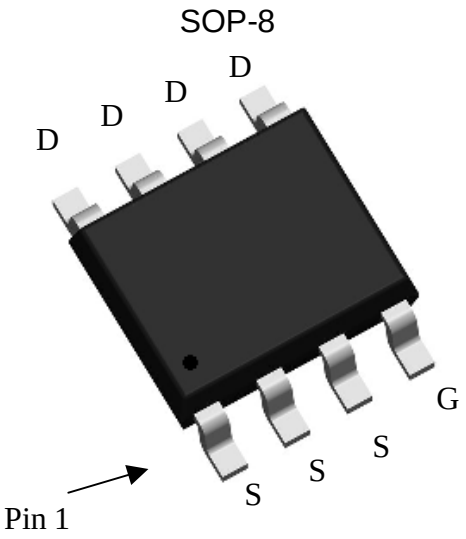
P-Channel Enhancement Mode Power MOSFET

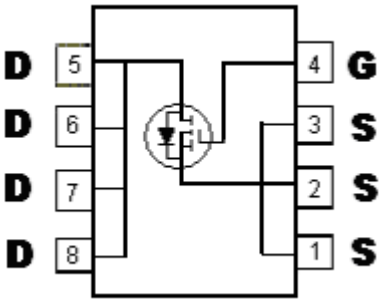
Features:

- Simple drive requirement
- Low on-resistance
- Fast switching speed
- Pb-free lead plating package

Outline



Equivalent Circuit



G：Gate S：Source D：Drain

BV_{DSS}	-30V
I_D@ T_A=25°C, V_{GS}=-10V	-12.7A
I_D@ T_A=70°C, V_{GS}=-10V	-10.2A
R_{DSON}@V_{GS}=-10V, I_D=-15A	6.9mΩ (typ.)
R_{DSON}@V_{GS}=-4.5V, I_D=-10A	9.0mΩ (typ.)
R_{DSON}@V_{GS}=-3V, I_D=-5A	14.1mΩ (typ.)

Device	Package	Shipping
KSCA7D0P03Q8	SOP-8 (Pb-free lead plating & halogen-free package)	2500 pcs / Tape & Reel

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @ T_A=25°C, V_{GS}=-10V		I_D	-12.7	A
Continuous Drain Current @ T_A=70°C, V_{GS}=-10V			-10.2	
Pulsed Drain Current		I_{DM}	-70 *1	
Avalanche Current @ L=0.1mH		I_{AS}	-60	
Avalanche Energy @ L=1mH, I_D=-24A, V_{DD}=-15V		E_{AS}	288 *2	mJ
Repetitive Avalanche Energy @ L=0.05mH		E_{AR}	2.5	
Total Power Dissipation	T_A=25℃	P_D	3.1 *3	W
	T_A=70℃		2.0 *3	
Operating Junction and Storage Temperature Range		Tj, Tstg	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	20	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	40 *3	

Note : 1. Pulse width limited by maximum junction temperature.
2. 100% tested by conditions of V_{DS}=-15V, L=0.1mH, I_{AS}=-10A, V_{GS}=-10V.
3. Surface mounted on 1 in² copper pad of FR-4 board, t≤10s ; 125°C/W when mounted on minimum copper pad.

Electrical Characteristics (Tj=25°C, unless otherwise specified)

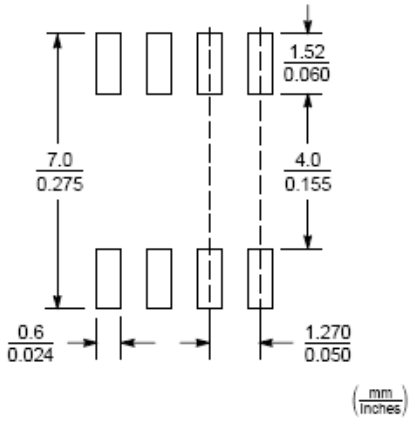
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-30	-	-	V	V_{GS}=0V, I_D=-250μA
$V_{GS(th)}$	-0.8	-	-1.6		V_{DS}=V_{GS}, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	-1	μA	V_{DS}=-24V, V_{GS}=0V
	-	-	-10		V_{DS}=-24V, V_{GS}=0V, Tj=125°C
$R_{DS(ON)}$ *1	-	6.9	9	mΩ	V_{GS}=-10V, I_D=-15A
	-	9.0	13		V_{GS}=-4.5V, I_D=-10A
	-	14.1	23		V_{GS}=-3V, I_D=-5A
G_{FS} *1	-	28.1	-	S	V_{DS}=-10V, I_D=-10A
Dynamic					
Ciss	-	3829	-	pF	V_{DS}=-15V, V_{GS}=0V, f=1MHz
Coss	-	396	-		
Crss	-	320	-		

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(ON)}$ *1, 2	-	14.8	-	ns	V_{DD}=-15V, I_D=-15A, V_{GS}=-10V, R_G=1Ω
tr *1, 2	-	20.2	-		
$t_{d(OFF)}$ *1, 2	-	124	-		
t_f *1, 2	-	26.4	-		
Qg *1, 2	-	78	-	nC	V_{DS}=-15V, I_D=-15A, V_{GS}=-10V
Qgs *1, 2	-	8.9	-		
Qgd *1, 2	-	14.9	-		
Rg	-	5.2	-	⌒	f=1MHz
Source-Drain Diode					
I_S *1	-	-	-2.6	A	
I_{SM} *3	-	-	-10		
V_{SD} *1	-	-0.81	-1.2	V	I_S=-10A, V_{GS}=0V
trr	-	17.8	-	ns	I_F=-10A, dI_F/dt=100A/μs
Qrr	-	11.9	-	nC	

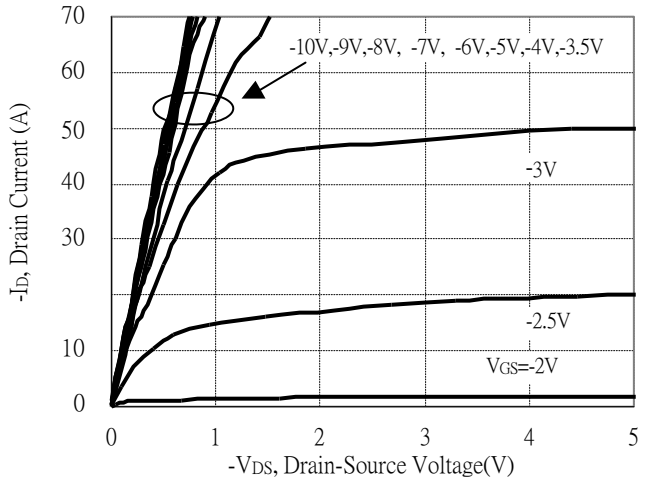
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

Recommended Soldering Footprint

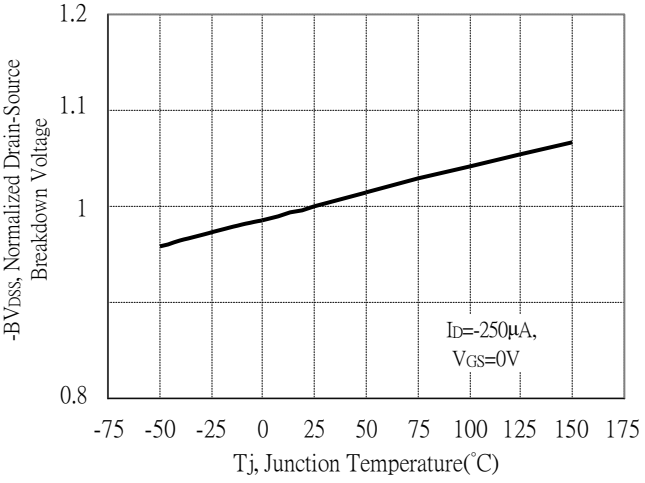


Typical Characteristics

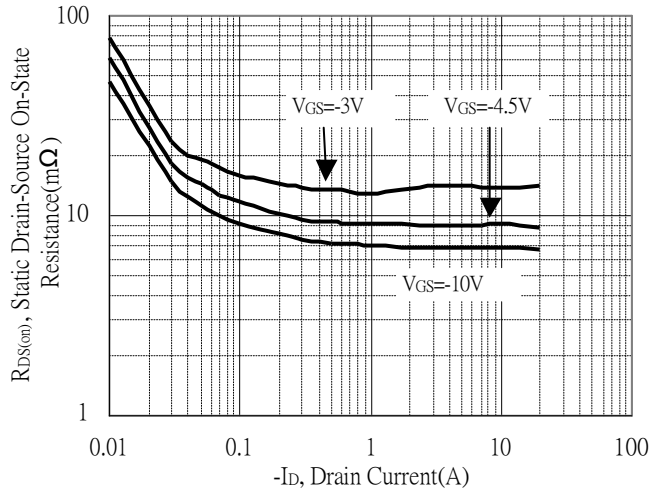
Typical Output Characteristics



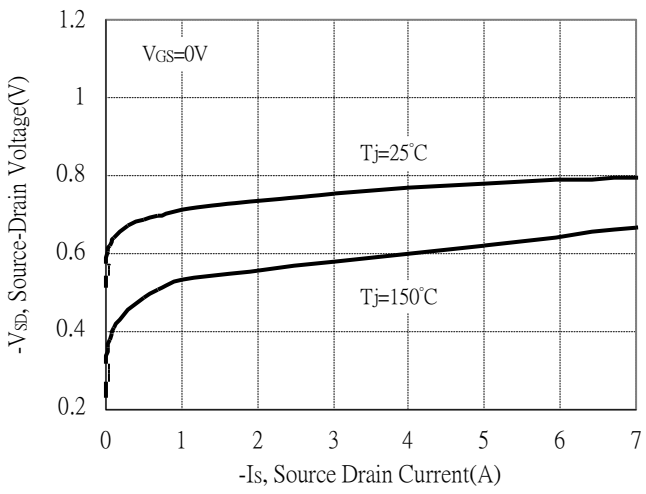
Brekdown Voltage vs Ambient Temperature



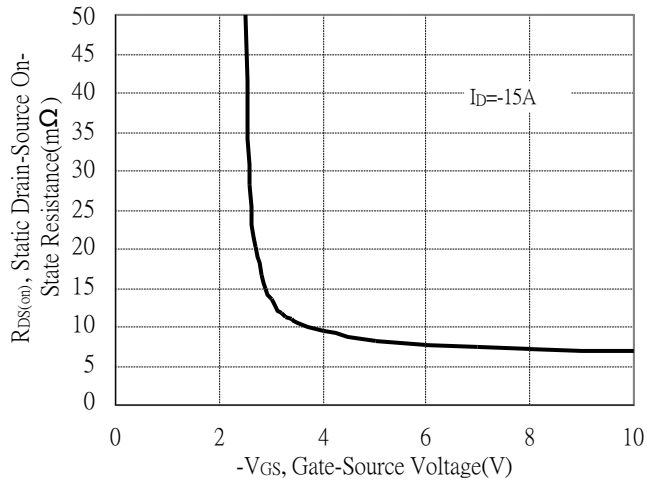
Static Drain-Source On-State resistance vs Drain Current



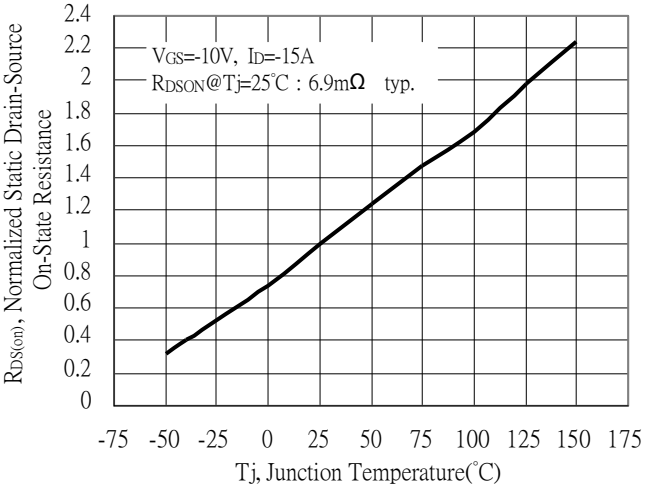
Source Drain Current vs Source-Drain Voltage



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

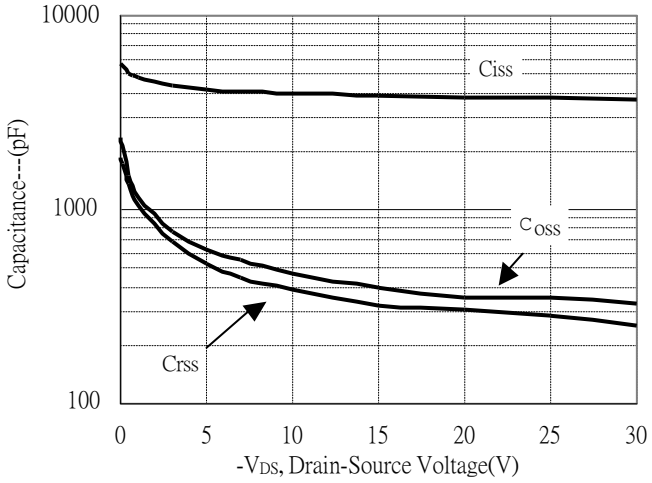


Drain-Source On-State Resistance vs Junction Tempearture

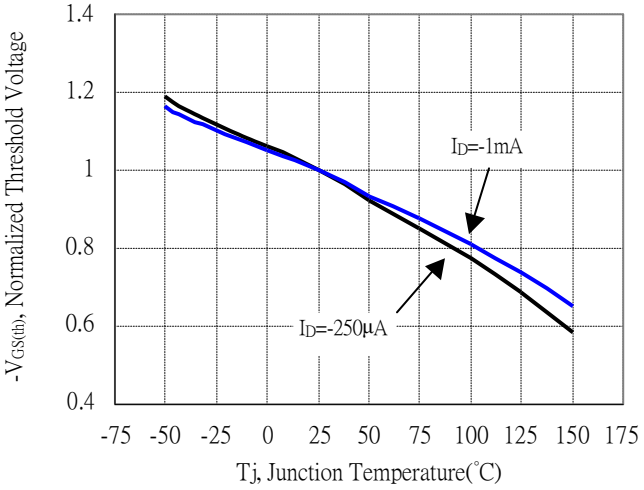


Typical Characteristics(Cont.)

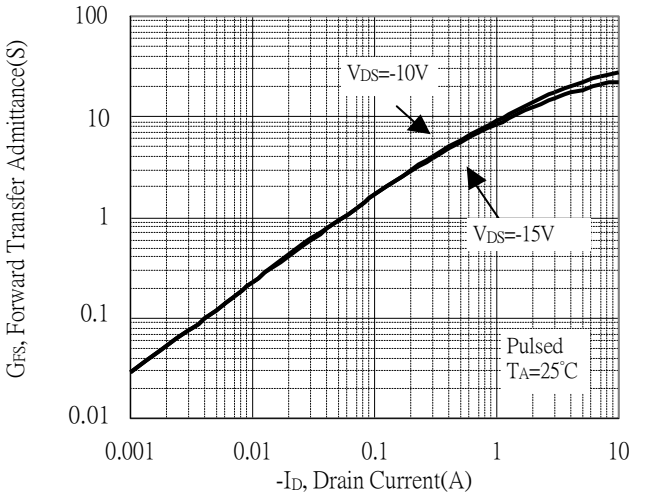
Capacitance vs Drain-to-Source Voltage



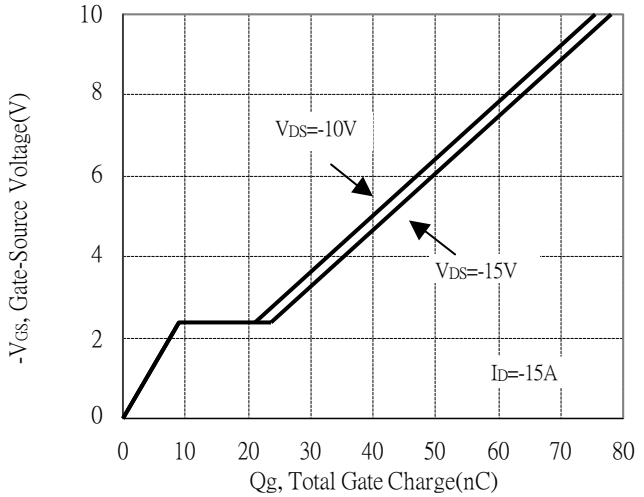
Threshold Voltage vs Junction Tempearture



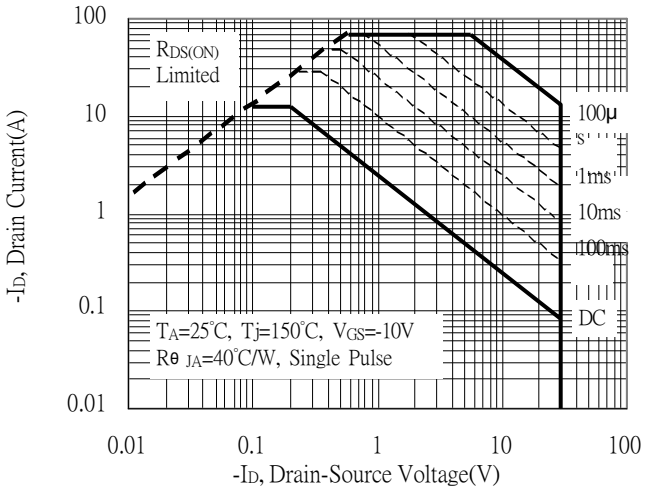
Forward Transfer Admittance vs Drain Current



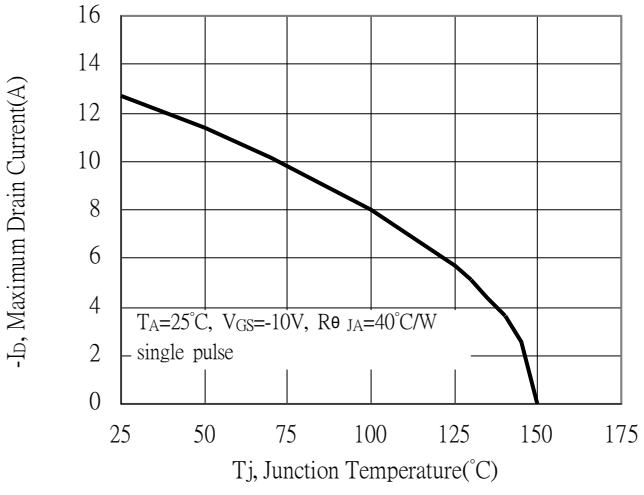
Gate Charge Characteristics



Maximum Safe Operating Area

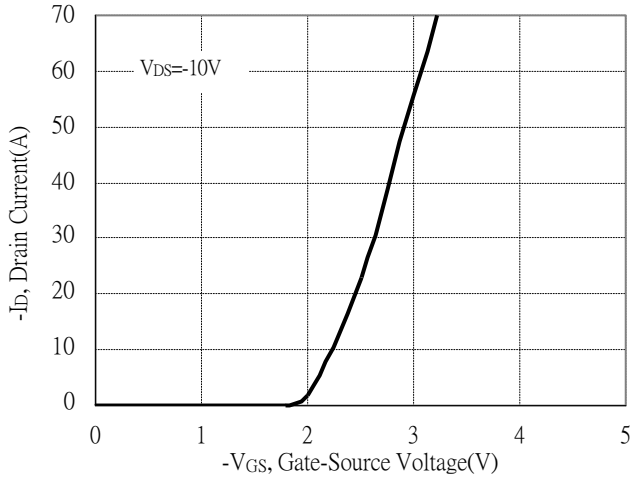


Maximum Drain Current vs Junction Temperature

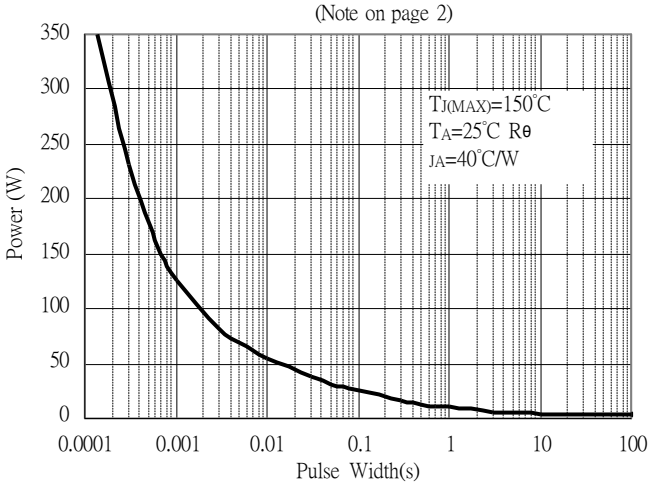


Typical Characteristics(Cont.)

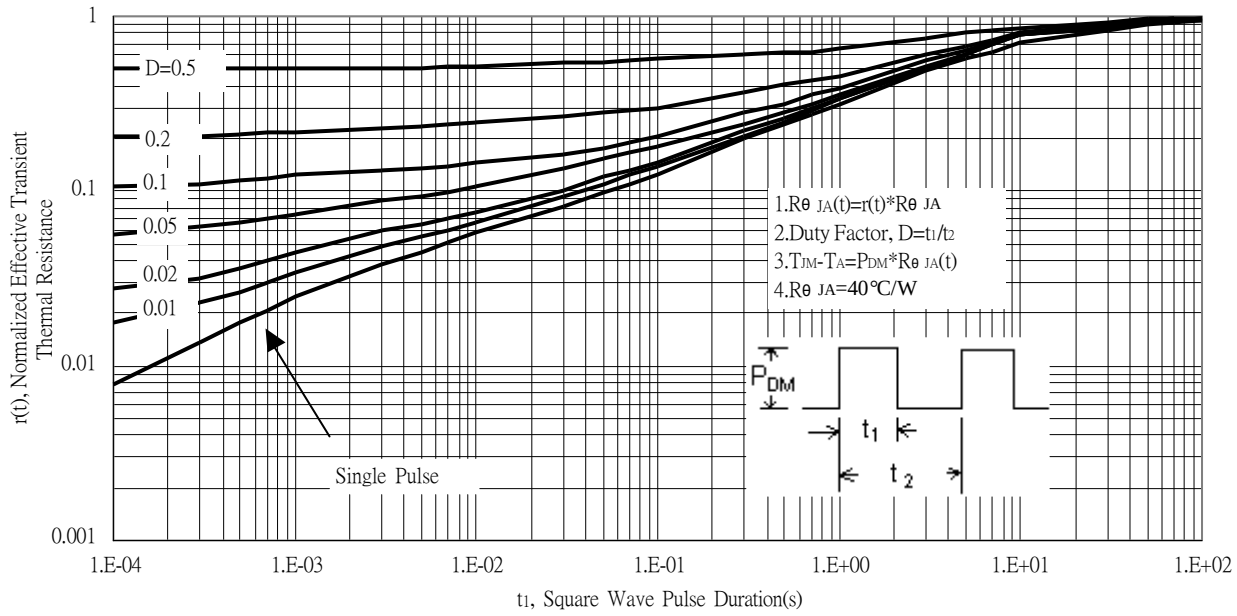
Typical Transfer Characteristics



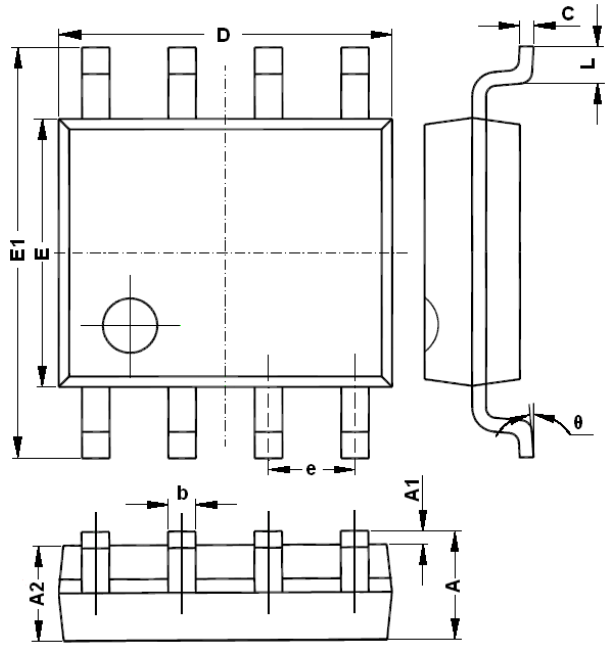
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



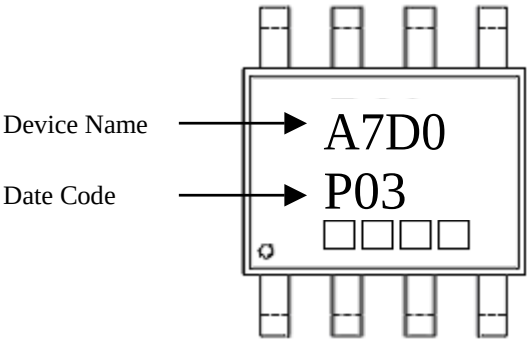
Transient Thermal Response Curves



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

8-Lead SOP-8 Plastic Package
Code: Q8

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	4.200	0.150	0.165
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	0.300	1.270	0.012	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					