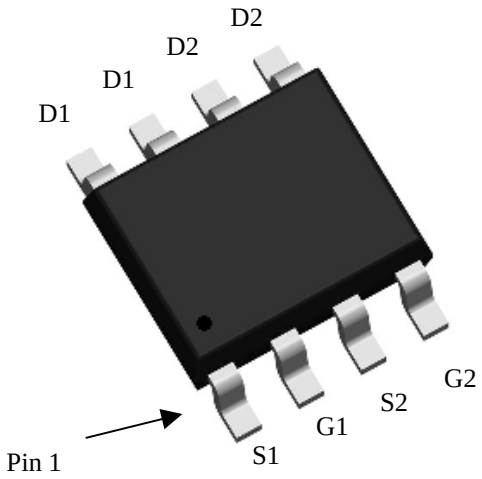
Dual N-Channel Enhancement Mode Power MOSFET

Features:

- Simple drive requirement
- Low on-resistance
- Fast switching speed
- Dual N-ch MOSFET package
- Pb-free lead plating & Halogen-free package

Outline

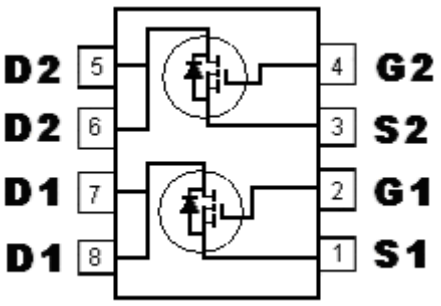
SOP-8



BV_{DSS}	**60V**
I_D@V_{GS}=10V, T_A=25°C	**4.3A**
R_{DSON}@V_{GS}=10V, I_D=5A	**34.6mΩ (typ)**
R_{DSON}@V_{GS}=4.5V, I_D=3A	**38.5mΩ (typ)**

Equivalent Circuit

KWB60A06AQ8



G：Gate
S：Source
D：Drain

Ordering Information

Device	Package	Shipping
KWB60A06AQ8	SOP-8 (Pb-free lead plating and halogen-free package)	2500 pcs / tape & reel

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current @ V_{GS}=10V, T_C=25°C	I_D	7.0	A
Continuous Drain Current @ V_{GS}=10V, T_C=100°C		4.4	
Continuous Drain Current @ V_{GS}=10V, T_A=25°C		4.3 (Note 2)	
Continuous Drain Current @ V_{GS}=10V, T_A=100°C		2.7 (Note 2)	
Pulsed Drain Current	I_{DM}	30 (Note 1)	
Single Pulse Avalanche Current @ L=0.1mH	I_{AS}	14	
Single Pulse Avalanche Energy@L=1mH, I_{AS}=7A, V_{DD}=15V	E_{AS}	24.5 (Note 4)	mJ
Power Dissipation for Dual Operation	P_D	2	W
Power Dissipation for Single Operation		1.6 (Note 2)	
		0.9 (Note 3)	
Operating Junction and Storage Temperature Range	Tj, Tstg	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{\theta JC}$	30	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{\theta JA}$	62.5	
		78 (Note 2)	
		135 (Note 3)	

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

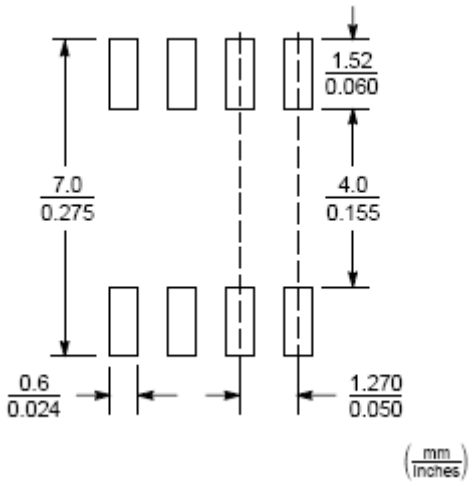
Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	60	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	1.0	-	2.5		V_{DS} =V_{GS}, I_D=250μA
G_{FS} *1	-	7.5	-	S	V_{DS} =10V, I_D=5A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS} =48V, V_{GS} =0V
	-	-	25		V_{DS} =40V, V_{GS} =0V, Tj=125°C
$R_{DS(ON)}$ *1	-	34.6	50	mΩ	V_{GS} =10V, I_D=5A
	-	38.5	60		V_{GS} =4.5V, I_D=3A
Dynamic					
Qg *1, 2	-	17.3	-	nC	V_{DS}=30V, I_D=5A, V_{GS}=10V
Qgs *1, 2	-	2.5	-		
Qgd *1, 2	-	2.6	-		

$t_{d(ON)}$ *1, 2	-	8.6	-	ns	V_{DS}=30V, I_D=5A, V_{GS}=10V, R_G=1Ω
tr *1, 2	-	17.8	-		
$t_{d(OFF)}$ *1, 2	-	32	-		
t_f *1, 2	-	6	-		
Ciss	-	903	-	pF	V_{GS}=0V, V_{DS}=30V, f=1MHz
Coss	-	48	-		
Crss	-	36	-		
Source-Drain Diode					
I_S *1	-	-	2.3	A	
I_{SM} *3	-	-	9.2		
V_{SD} *1	-	0.78	1.2	V	I_S=2.3A, V_{GS}=0V
trr *1	-	11.9	-	ns	I_F=2.3A, dI_F/dt=100A/μs
Qrr *1	-	7.2	-	nC	

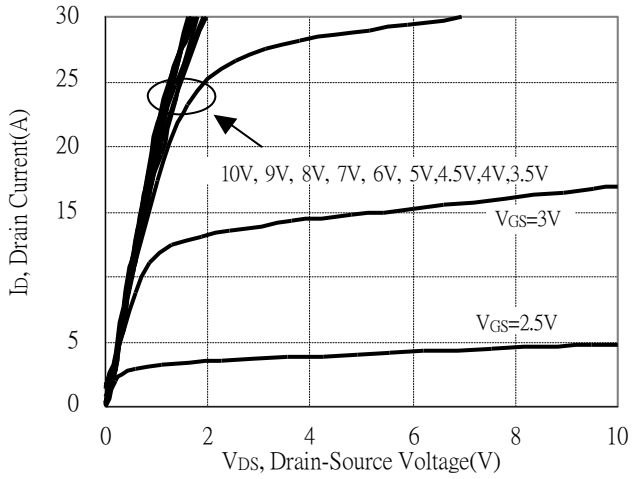
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

Recommended Soldering Footprint

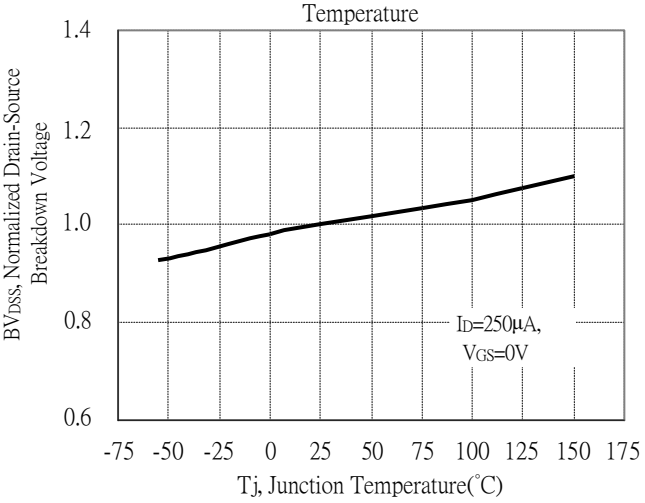


Typical Characteristics

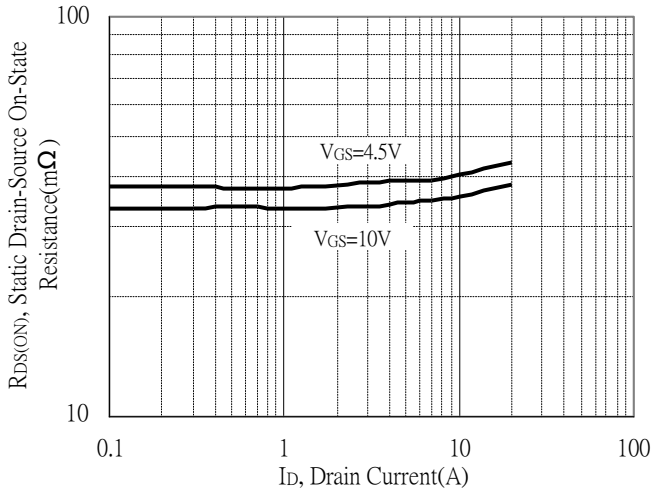
Typical Output Characteristics



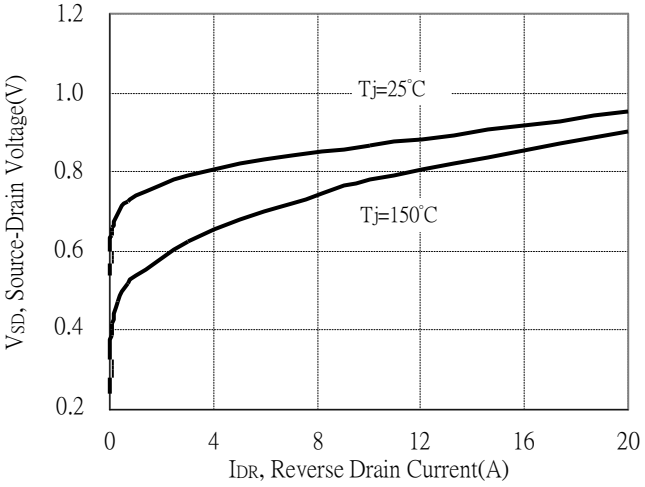
Normailzed Brekdown Voltage vs Ambient Temperature



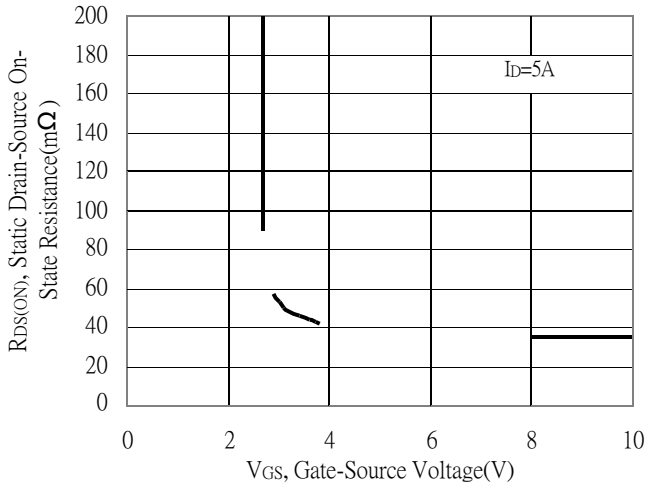
Static Drain-Source On-State resistance vs Drain Current



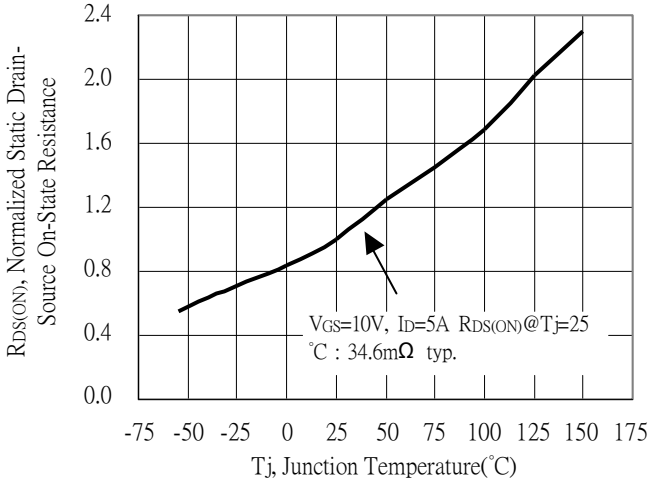
Reverse Drain Current vs Source-Drain Voltage



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

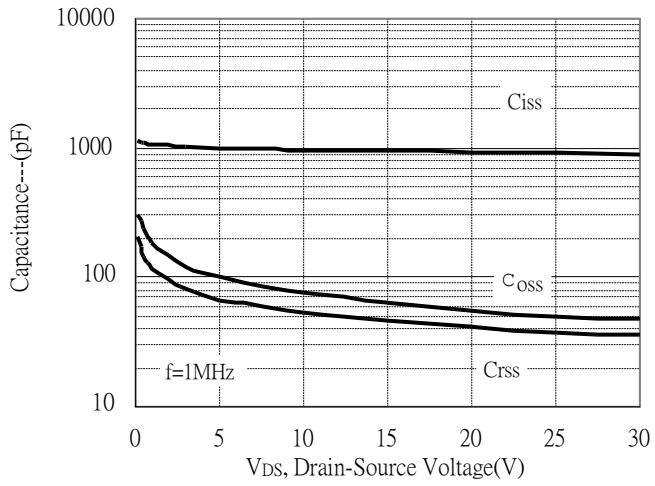


Normalized Drain-Source On-State Resistance vs Junction Tempearture

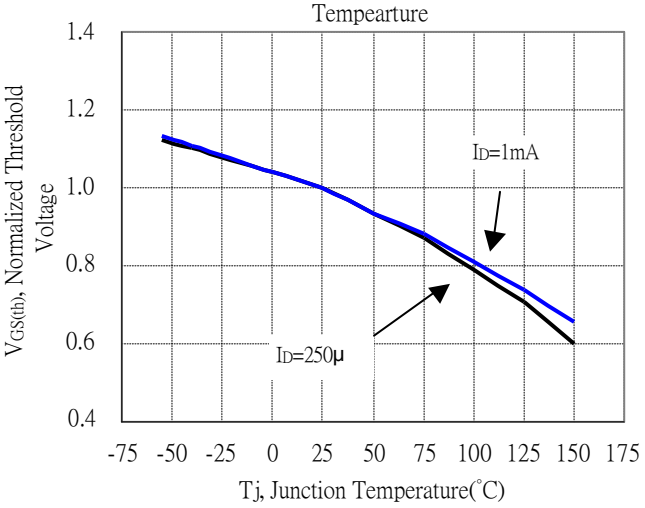


Typical Characteristics(Cont.)

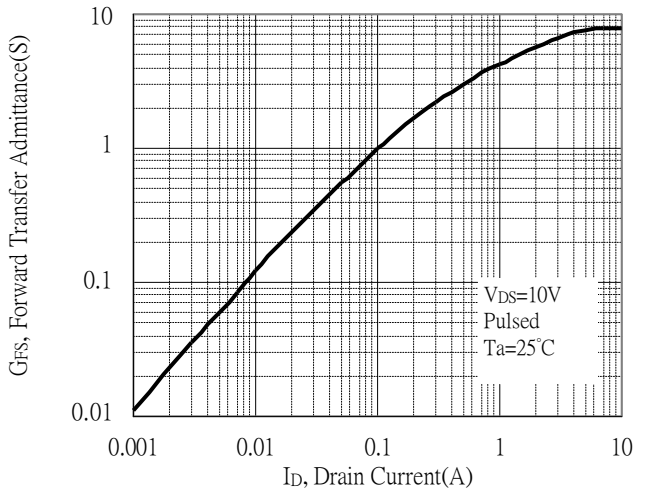
Capacitance vs Drain-to-Source Voltage



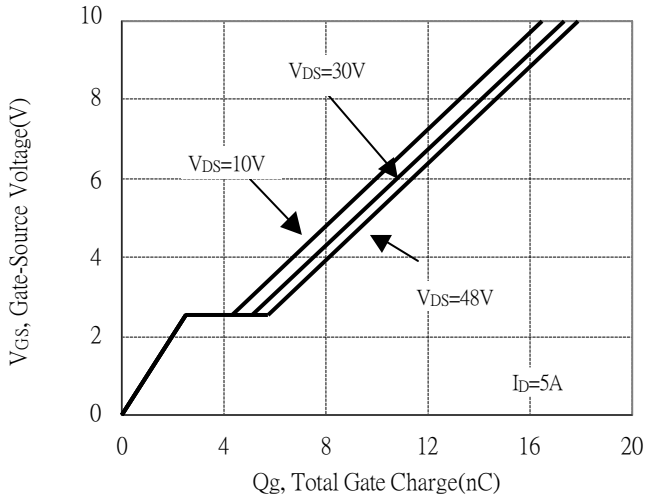
Normalized Threshold Voltage vs Junction Tempearture



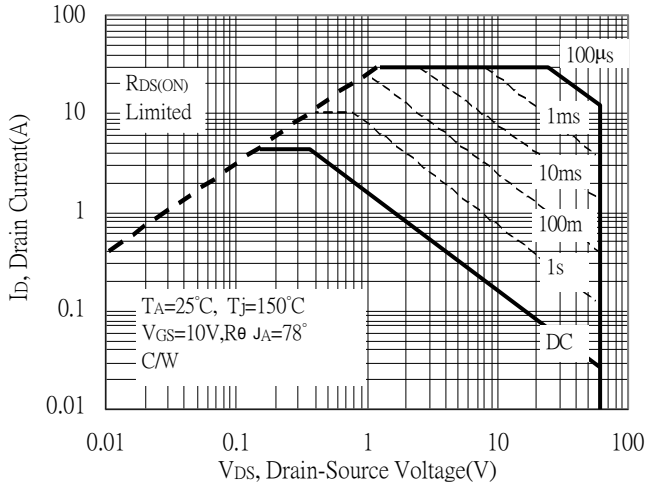
Forward Transfer Admittance vs Drain Current



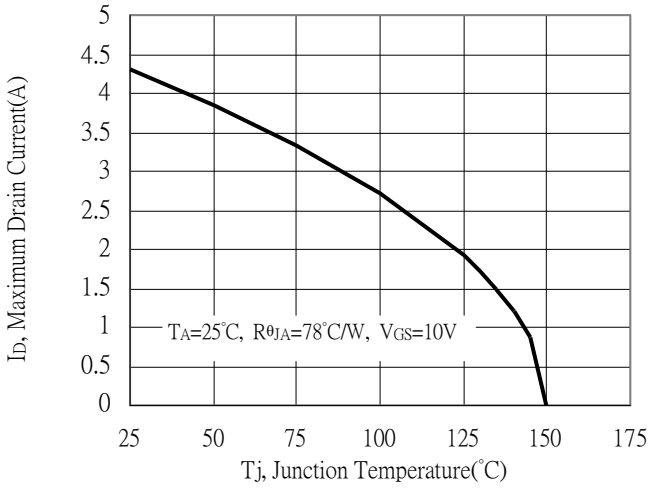
Gate Charge Characteristics



Maximum Safe Operating Area

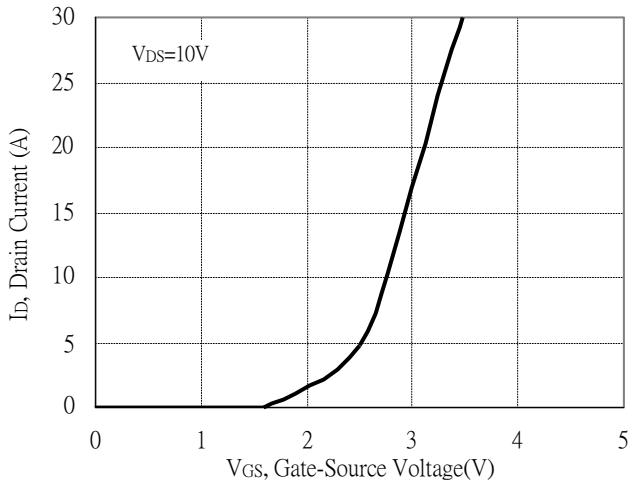


Maximum Drain Current vs Junction Temperature

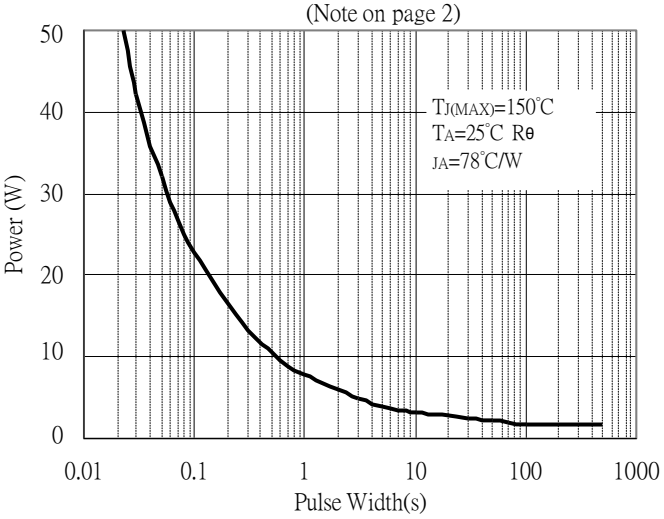


Typical Characteristics(Cont.)

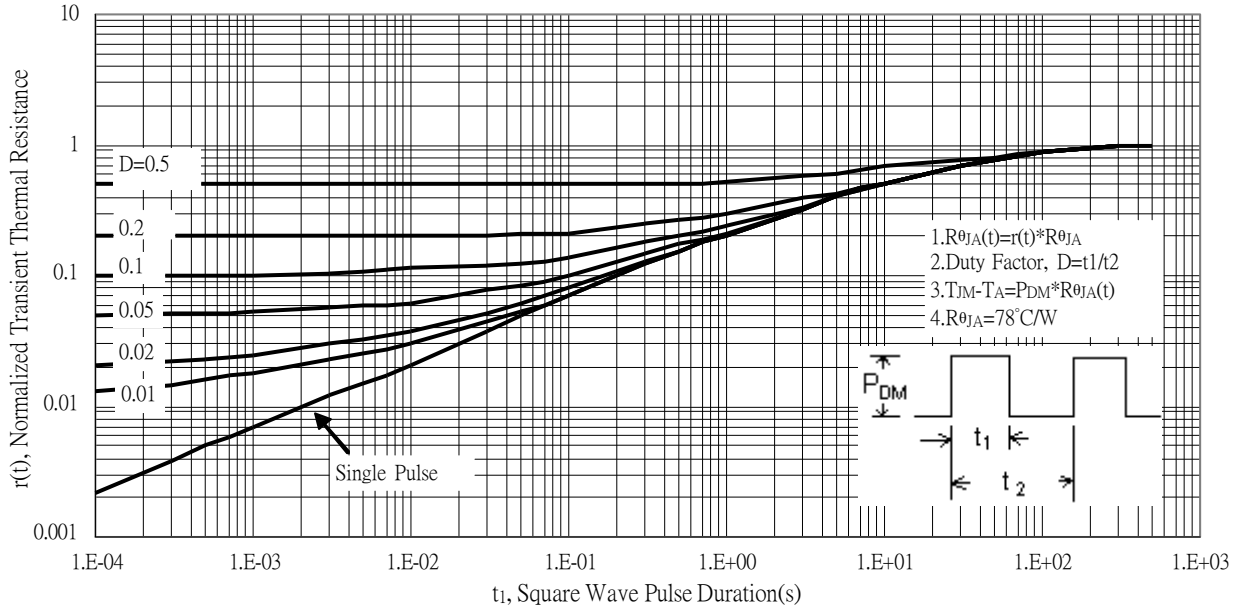
Typical Transfer Characteristics



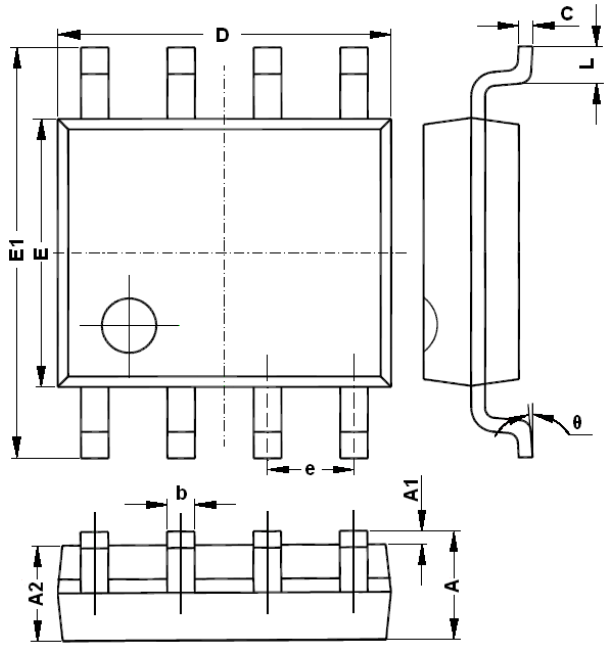
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



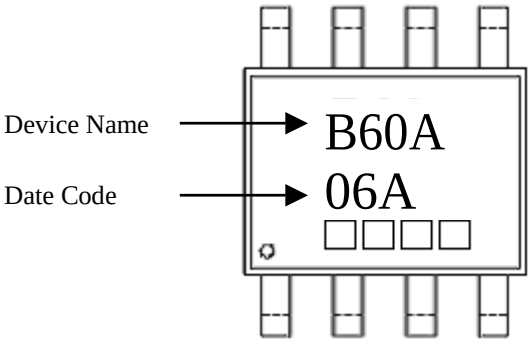
Transient Thermal Response Curves



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

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	4.000	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					