

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

MTP4403Q8

BV_{DSS}	-30V
$R_{DS(ON)(MAX)}$	50mΩ
I_D	-6.1A

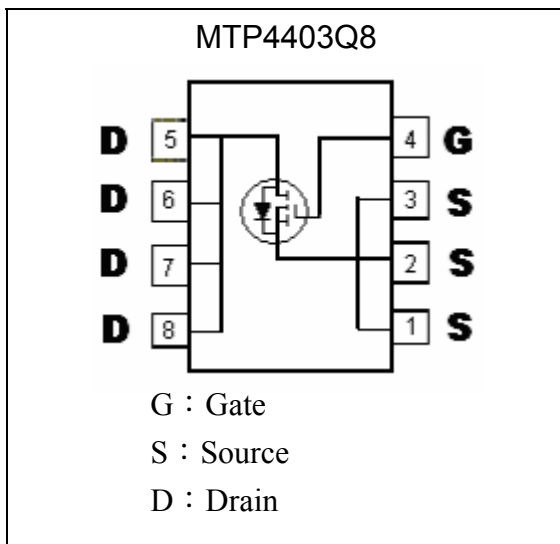
Description

The MTP4403Q8 is a P-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.

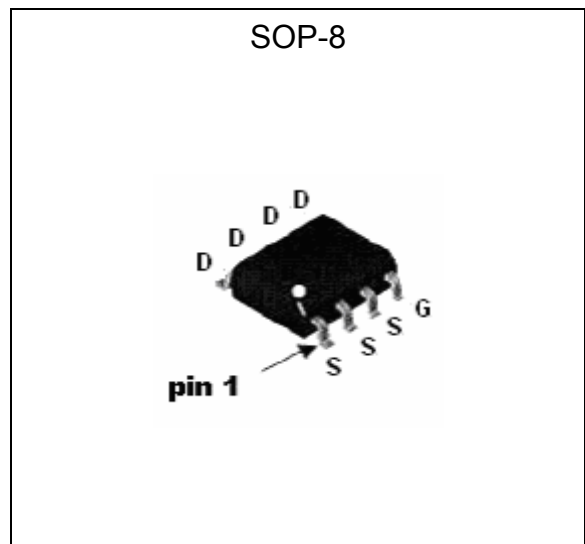
Features

- $R_{DS(ON)}=50m\Omega @V_{GS}=-10V, I_D=-6.1A$
 $R_{DS(ON)}=61m\Omega @V_{GS}=-4.5V, I_D=-5A$
- Simple drive requirement
- Low gate charge
- Low voltage drive (2.5V)
- Low on-resistance
- Fast switching speed
- Pb-free lead plating package

Equivalent Circuit



Outline



Ordering Information

Device	Package	Shipping
MTP4403Q8	SOP-8 (Pb-free lead plating package)	3000 pcs / Tape & Reel



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Breakdown Voltage	V _{DS}	-30	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current (Note 1)	I _D	-6.1	A
Continuous Drain Current, T _A =70°C (Note 1)	I _D	-5.1	A
Pulsed Drain Current (Note 2)	I _{DM}	-60	A
Total Power Dissipation (Note 1)	P _d	2.5	W
Linear Derating Factor		0.02	W / °C
Operating Junction and Storage Temperature Range	T _j ; T _{stg}	-55~+150	°C
Thermal Resistance, Junction-to-Ambient (Note 1)	R _{th,j-a}	50	°C/W

Note : 1.Surface mounted on 1 in² copper pad of FR-4 board; 125 °C/W when mounted on minimum copper pad.
 2.Pulse width limited by maximum junction temperature.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-30	-	-	V	V _{GS} =0, I _D =-250μA
V _{GS(th)}	-0.6	-	-1.3	V	V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±12V, V _{DS} =0
I _{DSS}	-	-	-1	μA	V _{DS} =-30V, V _{GS} =0
	-	-	-5		V _{DS} =-24V, V _{GS} =0, T _j =55°C
*R _{DS(ON)}	-	-	50	mΩ	I _D =-6.1A, V _{GS} =-10V
	-	-	61		I _D =-5A, V _{GS} =-4.5V
	-	-	117		I _D =-1A, V _{GS} =-2.5V
*G _{FS}	-	11	-	S	V _{DS} =-5V, I _D =-5A
Dynamic					
C _{iss}	-	940	-	pF	V _{DS} =-15V, V _{GS} =0, f=1MHz
C _{oss}	-	104	-		
C _{rss}	-	73	-		
*t _{d(ON)}	-	7.6	-	ns	V _{DS} =-15V, V _{GS} =-10V, R _G =6Ω, R _D =2.4Ω
*t _r	-	8.6	-		
*t _{d(OFF)}	-	44.7	-		
*t _f	-	16.5	-		
*Q _g	-	9.4	-	nC	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-5A
*Q _{gs}	-	2	-		
*Q _{gd}	-	3	-		
Source Drain Diode					
*V _{SD}	-	-	-1	V	V _{GS} =0V, I _S =-1A
*I _S	-	-	-4.2	A	
*T _{rr}	-	22.7	-	ns	I _S =-5A, V _{GS} =0, dI/dt=100A/μs
*Q _{rr}	-	15.9	-	nC	

*Pulse Test : Pulse Width ≤300μs, Duty Cycle ≤2%

Typical Characteristics

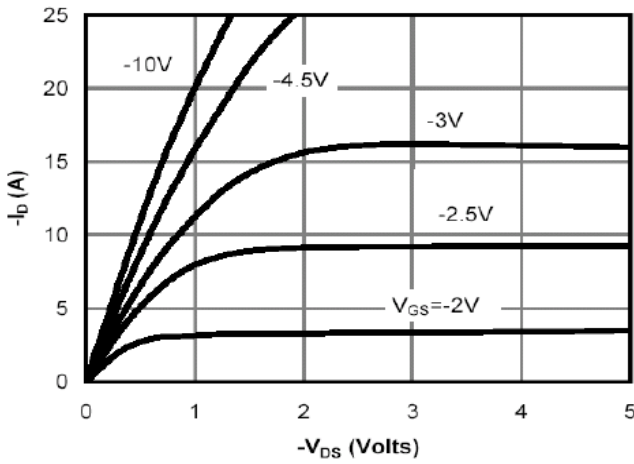


Fig 1. Typical Output Characteristics

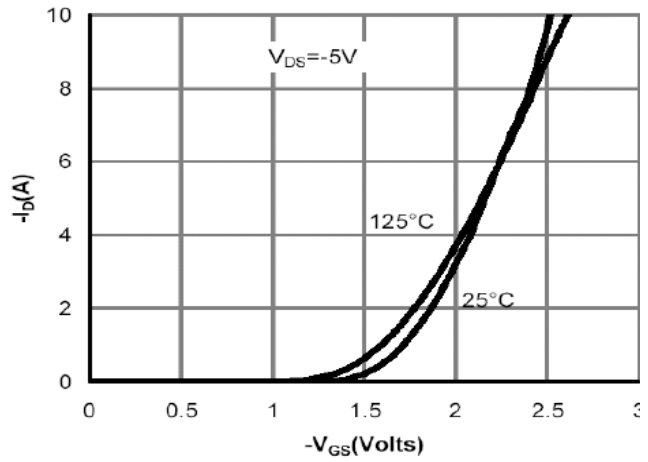


Fig 2. Transfer Characteristics

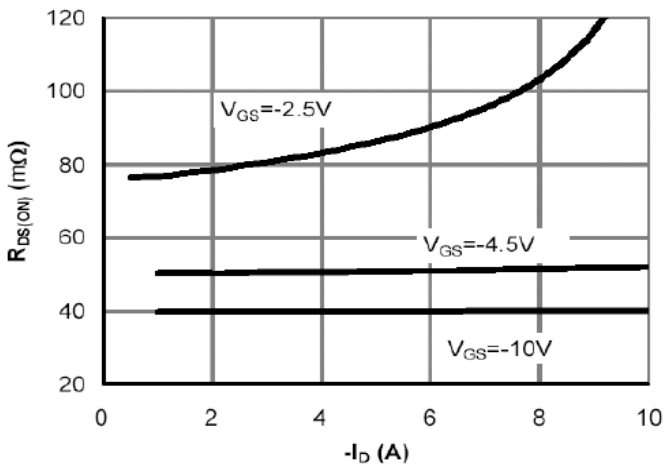


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

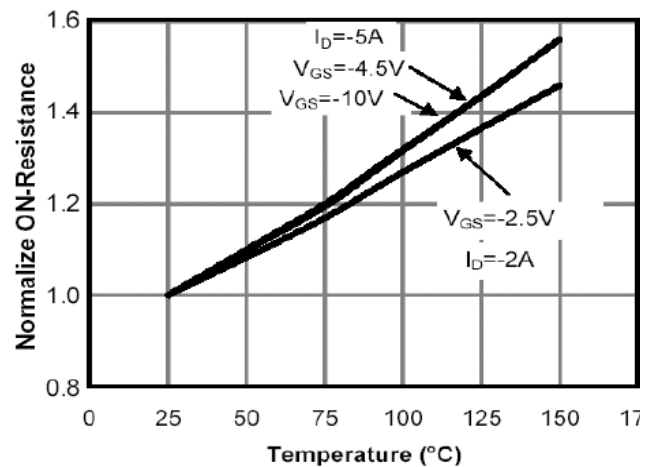


Fig 4. On-Resistance vs. Junction Temperature

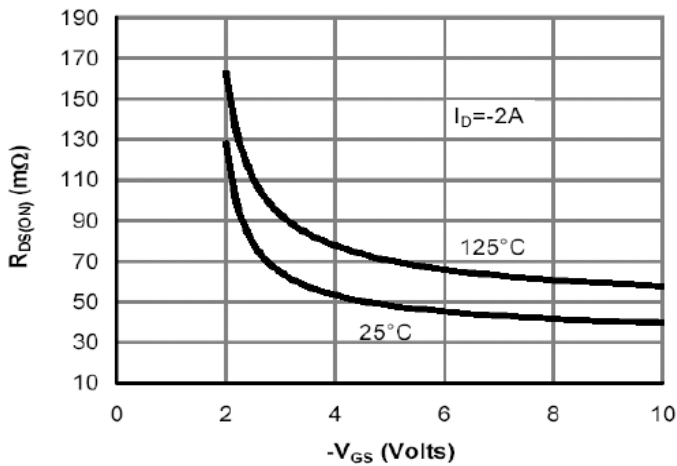


Fig 5. On-Resistance vs. Gate-Source Voltage

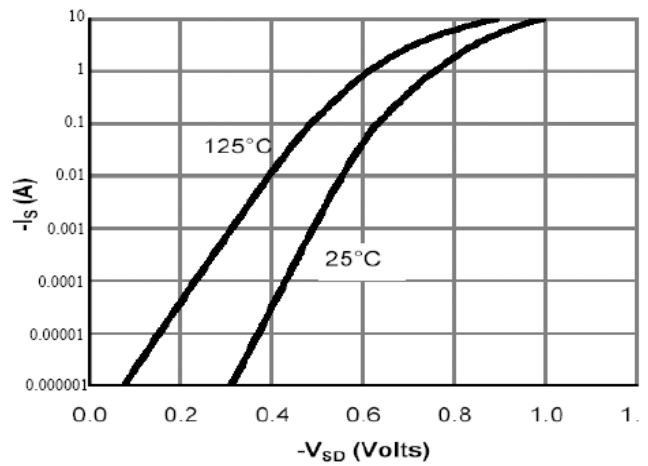


Fig 6. Body Diode Characteristics

Typical Characteristics(Cont.)

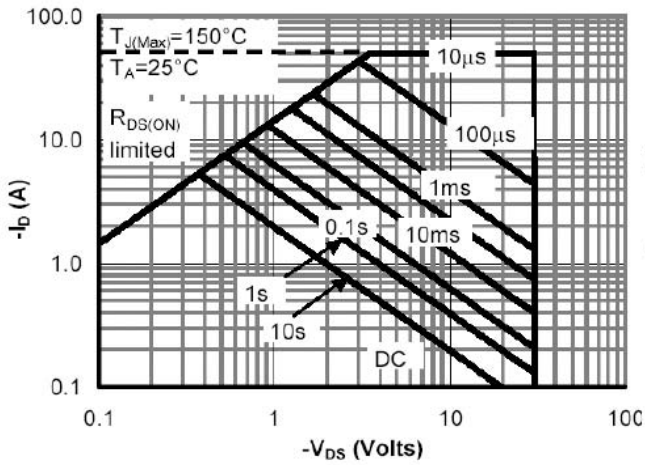


Fig 7. Maximum Safe Operating Area

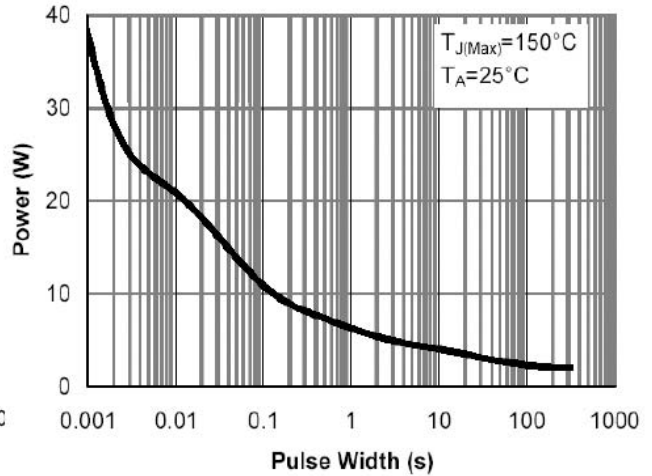


Fig 8. Single Pulse Power Rating Junction-to-Ambient

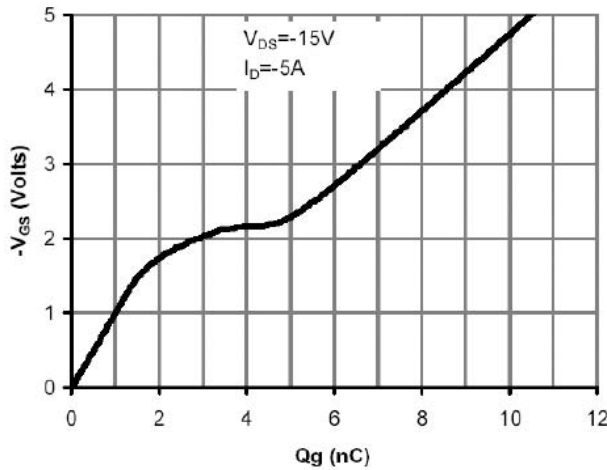


Fig 9. Gate Charge Characteristics

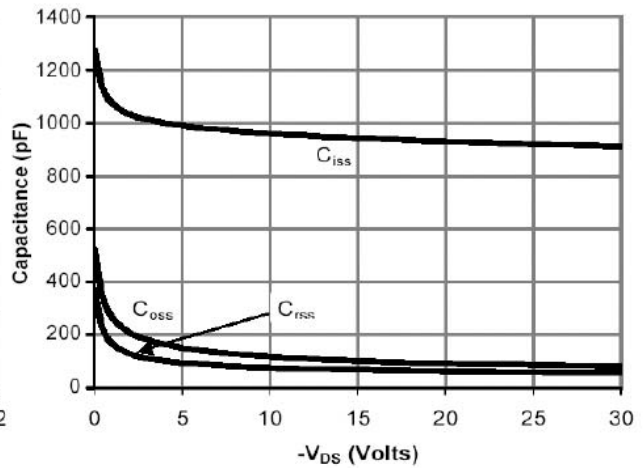


Fig 10. Typical Capacitance Characteristics

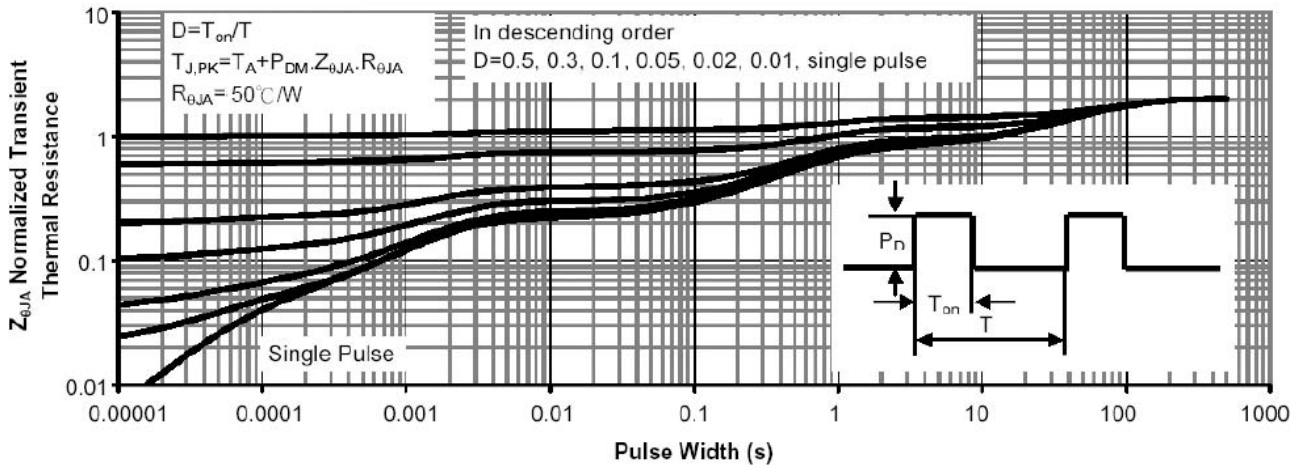
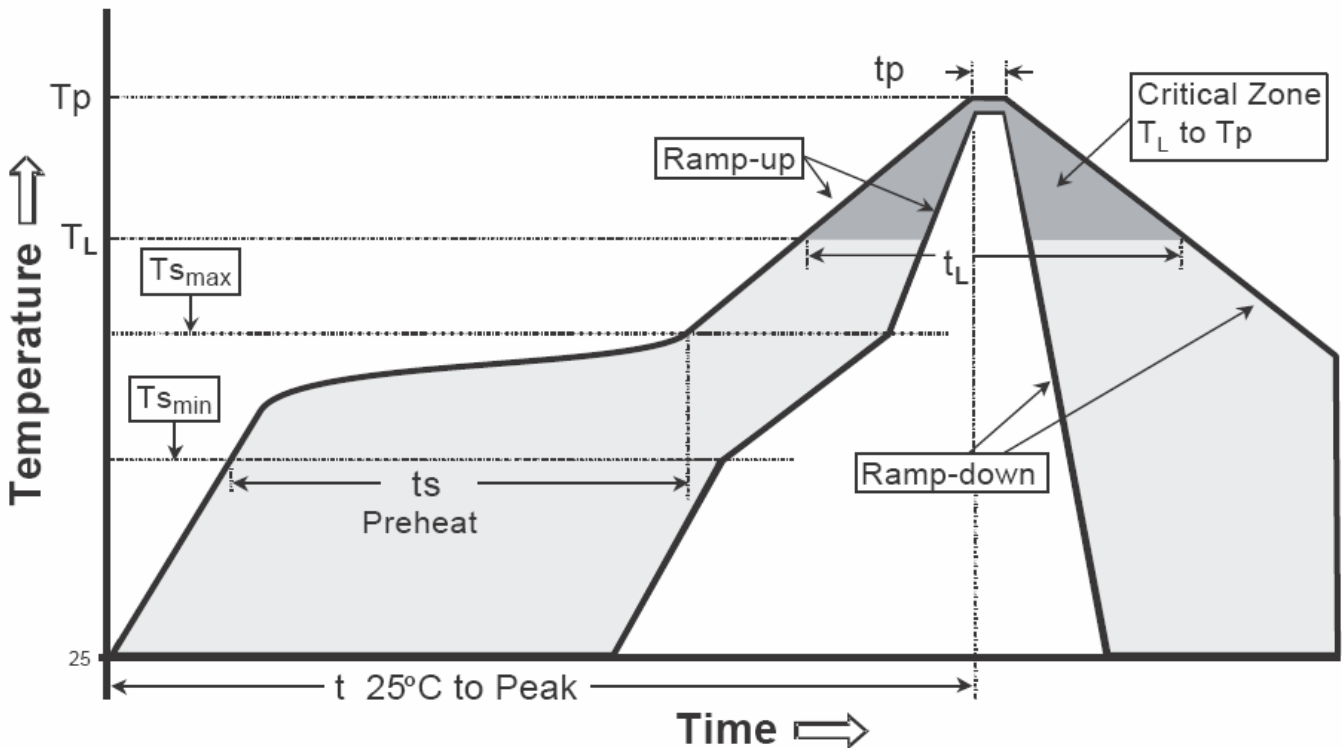


Fig 11. Normalized Maximum Transient Thermal Impedance

Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

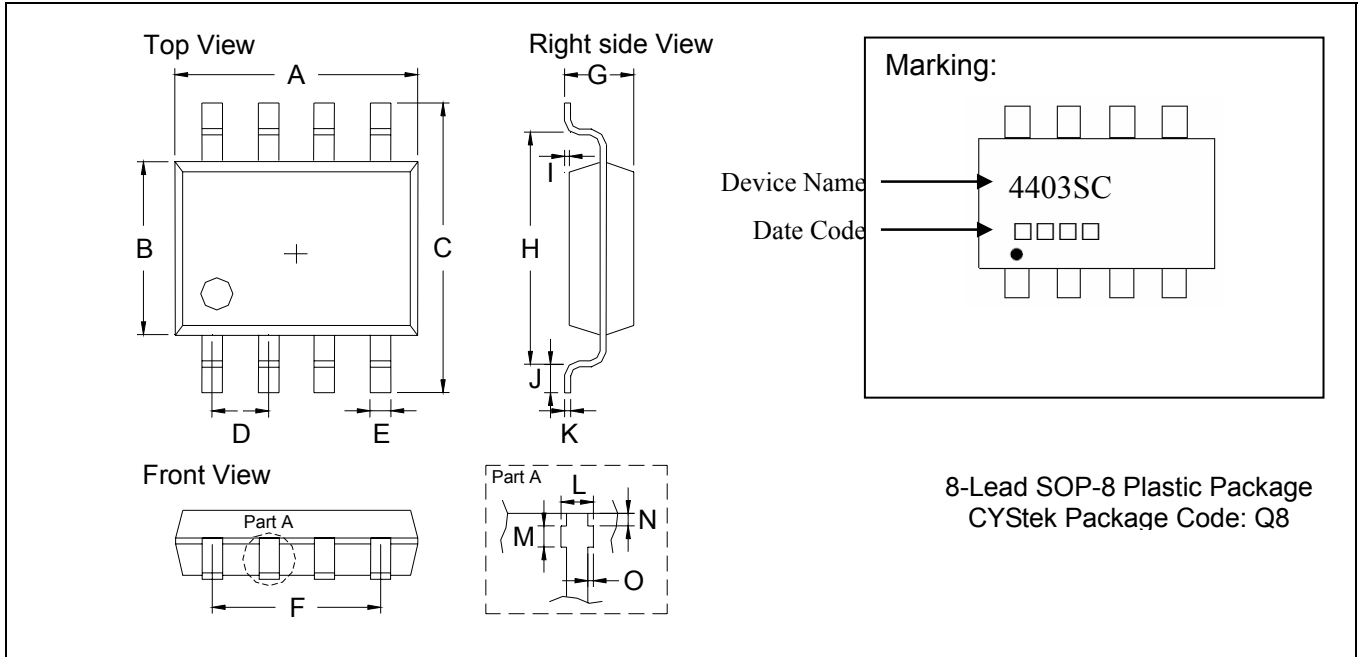
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (TL)	183°C	217°C
- Time (tL)	60-150 seconds	60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

SOP-8 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1890	0.2007	4.80	5.10	I	0.0098	REF	0.25	REF
B	0.1496	0.1654	3.80	4.20	J	0.0118	0.0354	0.30	0.90
C	0.2283	0.2441	5.80	6.20	K	0.0074	0.0098	0.19	0.25
D	0.0480	0.0519	1.22	1.32	L	0.0145	0.0204	0.37	0.52
E	0.0138	0.0193	0.35	0.49	M	0.0118	0.0197	0.30	0.50
F	0.1472	0.1527	3.74	3.88	N	0.0031	0.0051	0.08	0.13
G	0.0531	0.0689	1.35	1.75	O	0.0000	0.0059	0.00	0.15
H	0.1889	0.2007	4.80	5.10					

- Notes:**
- Controlling dimension: millimeters.
 - Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 - If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

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