

P-Channel Logic Level Enhancement Mode Power MOSFET

MTB45P03Q8

BV_{DSS}	-30V
I_D	-6A
$R_{DS(ON)(MAX)}$	45m Ω

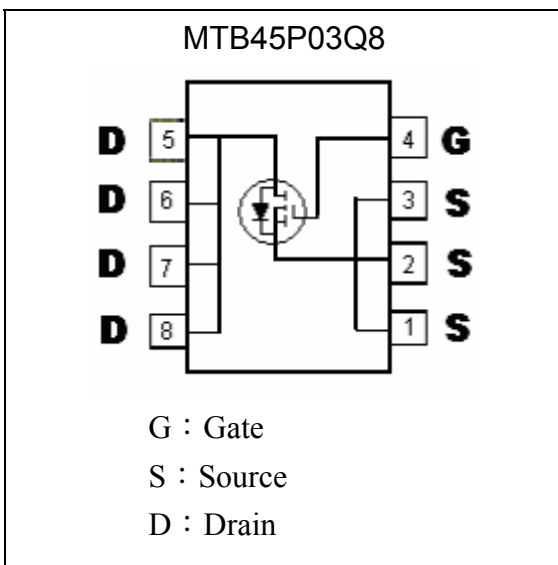
Description

The MTB45P03Q8 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.

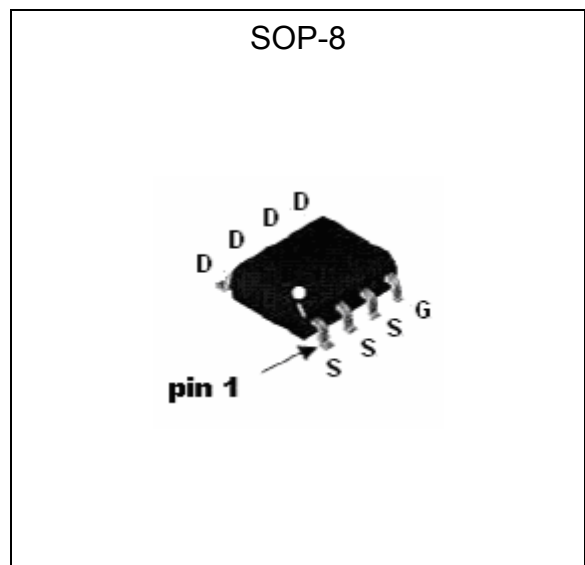
Features

- $R_{DS(ON)}=45m\Omega @ V_{GS}=-10V, I_D=-6A$
 $R_{DS(ON)}=75m\Omega @ V_{GS}=-5V, I_D=-5A$
- Simple drive requirement
- Low on-resistance
- Fast switching speed
- Pb-free and Halogen-free package

Equivalent Circuit



Outline





Absolute Maximum Ratings ($T_C=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Limits	Unit	
Drain-Source Breakdown Voltage	BV_{DSS}	-30	V	
Gate-Source Voltage	V_{GS}	± 20	V	
Continuous Drain Current @ $T_C=25^{\circ}C$	I_D	-6	A	
Continuous Drain Current @ $T_C=100^{\circ}C$		-5	A	
Pulsed Drain Current (Note 1)	I_{DM}	-24	A	
Power Dissipation	P_D	$T_A=25^{\circ}C$	3	W
		$T_A=100^{\circ}C$	1.5	W
Operating Junction and Storage Temperature Range	$T_j ; T_{stg}$	-55~+175	$^{\circ}C$	

Note : 1.Pulse width limited by maximum junction temperature.

Electrical Characteristics ($T_C=25^{\circ}C$, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-30	-	-	V	$V_{GS}=0, I_D=-250\mu A$
$V_{GS(th)}$	-1	-1.5	-3	V	$V_{DS}=V_{GS}, I_D=-250\mu A$
I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0$
I_{DSS}	-	-	-1	μA	$V_{DS}=-24V, V_{GS}=0$
I_{DSS}	-	-	-10	μA	$V_{DS}=-20V, V_{GS}=0, T_j=125^{\circ}C$
$I_{D(ON)}$ (Note 1)	-24	-	-	A	$V_{DS}=-5V, V_{GS}=-10V$
$R_{DS(ON)}$ (Note 1)	-	37	45	m Ω	$I_D=-6A, V_{GS}=-10V$
	-	60	75		$I_D=-5A, V_{GS}=-5V$
G_{FS} (Note 1)	-	16	-	S	$V_{DS}=-5V, I_D=-6A$
Dynamic					
C_{iss}	-	1320	-	pF	$V_{DS}=-15V, V_{GS}=0, f=1MHz$
C_{oss}	-	500	-		
C_{rss}	-	460	-		
$t_{d(ON)}$ (Note 1&2)	-	5.5	-	ns	$V_{DS}=-15V, I_D=-1A, V_{GS}=-10V, R_G=6\Omega$
t_r (Note 1&2)	-	10	-		
$t_{d(OFF)}$ (Note 1&2)	-	18	-		
t_f (Note 1&2)	-	5	-		
Q_g (Note 1&2)	-	10	-	nC	$V_{DS}=-15V, I_D=-6A, V_{GS}=-10V,$
Q_{gs} (Note 1&2)	-	2.2	-		
Q_{gd} (Note 1&2)	-	2	-		
Source-Drain Diode					
I_S	-	-	-2.3	A	
I_{SM} (Note 3)	-	-	-9.2		
V_{SD} (Note 1)	-	-	-1.3	V	$I_F=I_S, V_{GS}=0V$
t_{rr}	-	15	-	Ns	$I_F=I_S, dI_F/dt=100A/\mu s$
Q_{rr}	-	8	-	nC	

Note : 1.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
 2.Independent of operating temperature
 3.Pulse width limited by maximum junction temperature

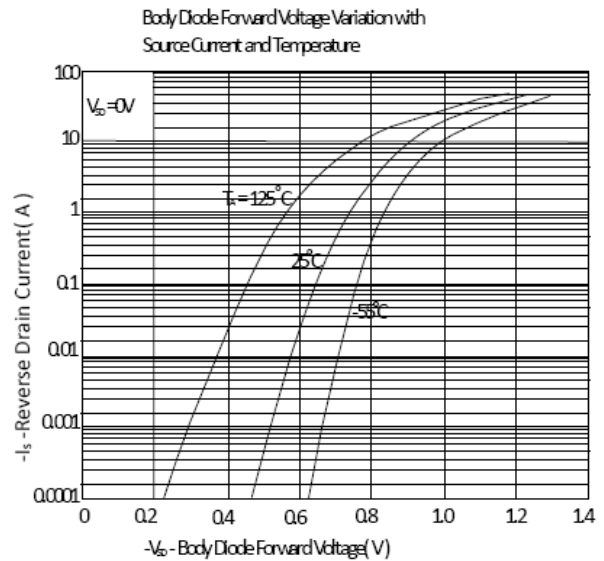
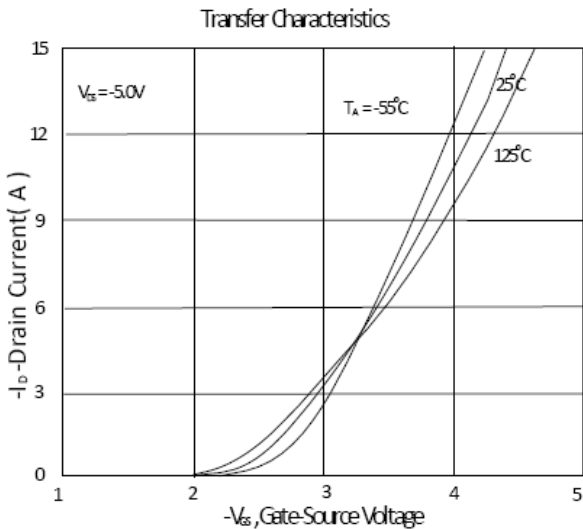
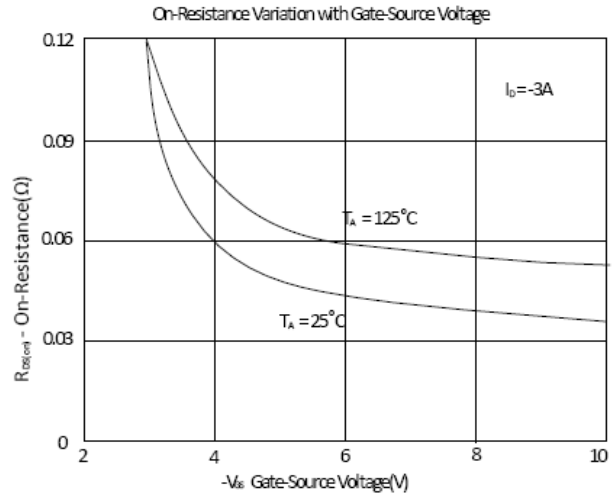
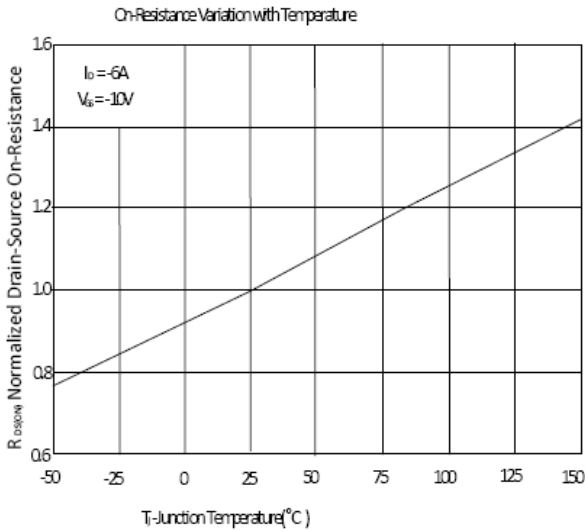
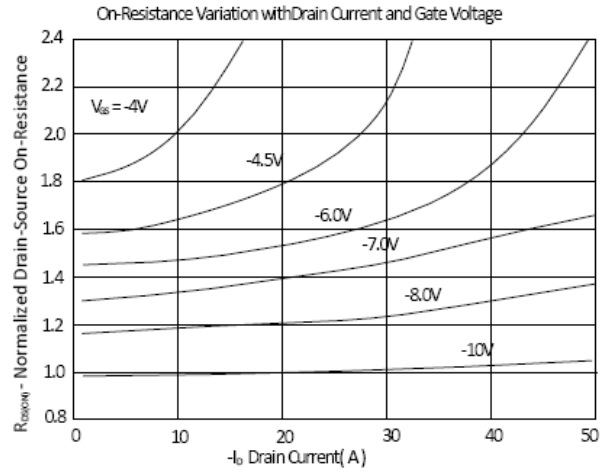
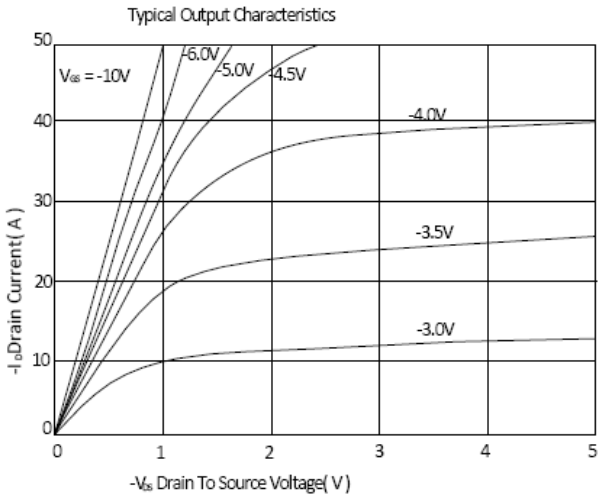


Thermal Resistance Ratings

Thermal Resistance	Symbol	Typical	Maximum	Unit
Junction-to-Case	$R_{\theta JC}$		25	°C / W
Junction-to-Ambient (Note)	$R_{\theta JA}$		50	

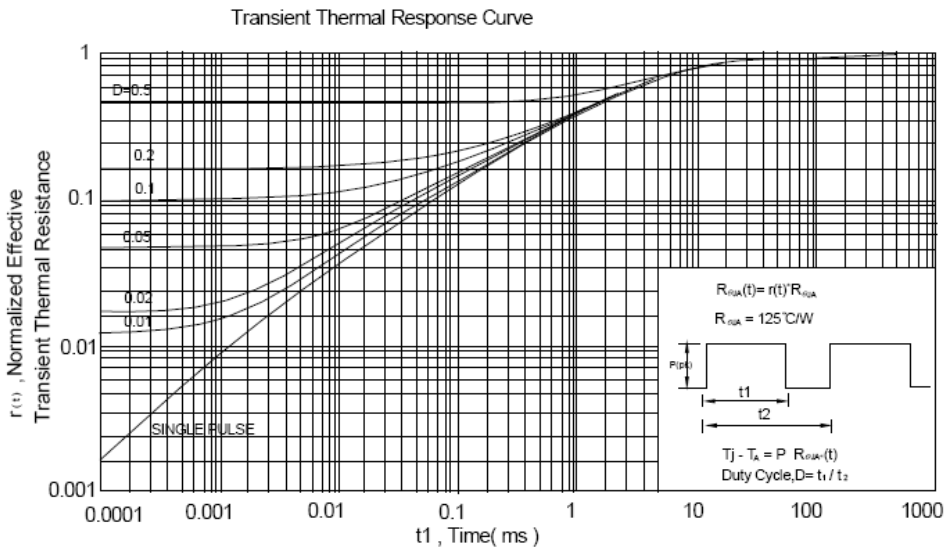
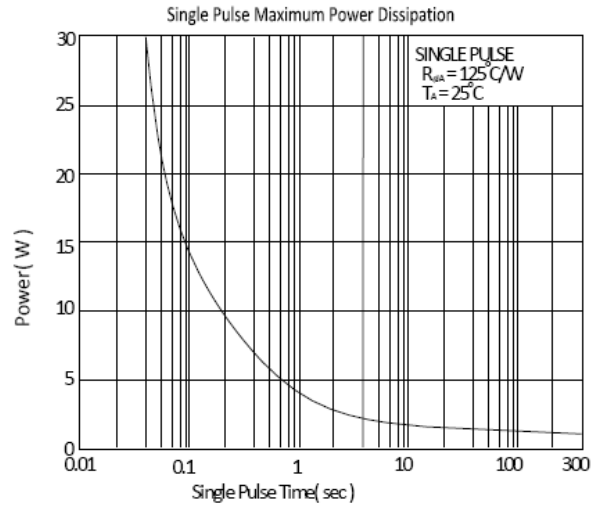
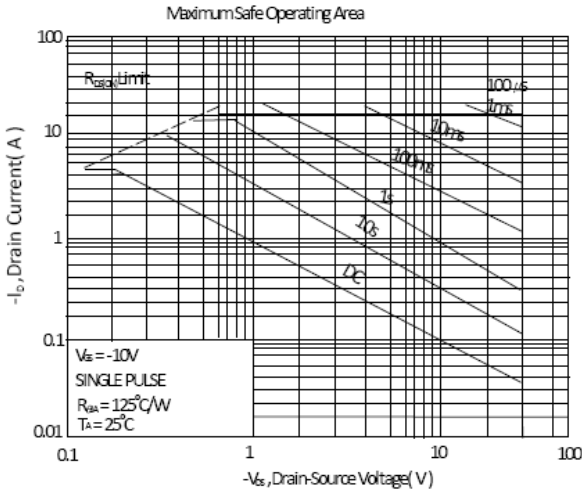
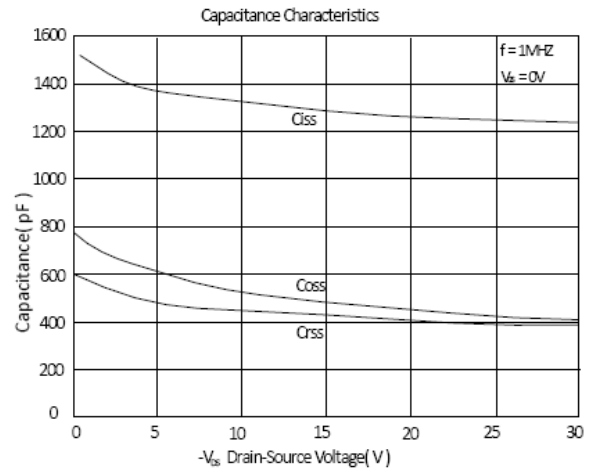
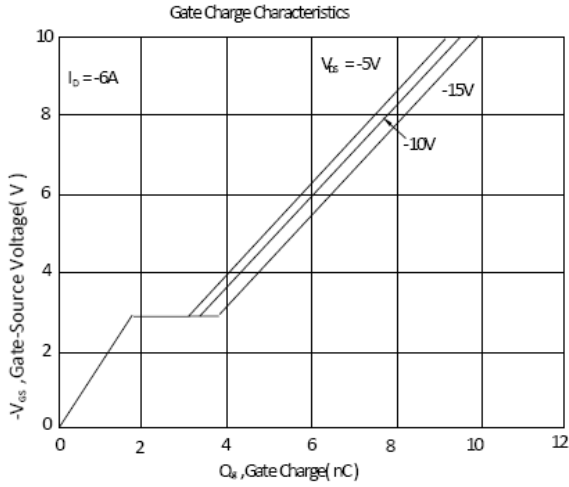
Note : 50°C / W when mounted on a 1 in² pad of 2 oz copper.

Characteristic Curves

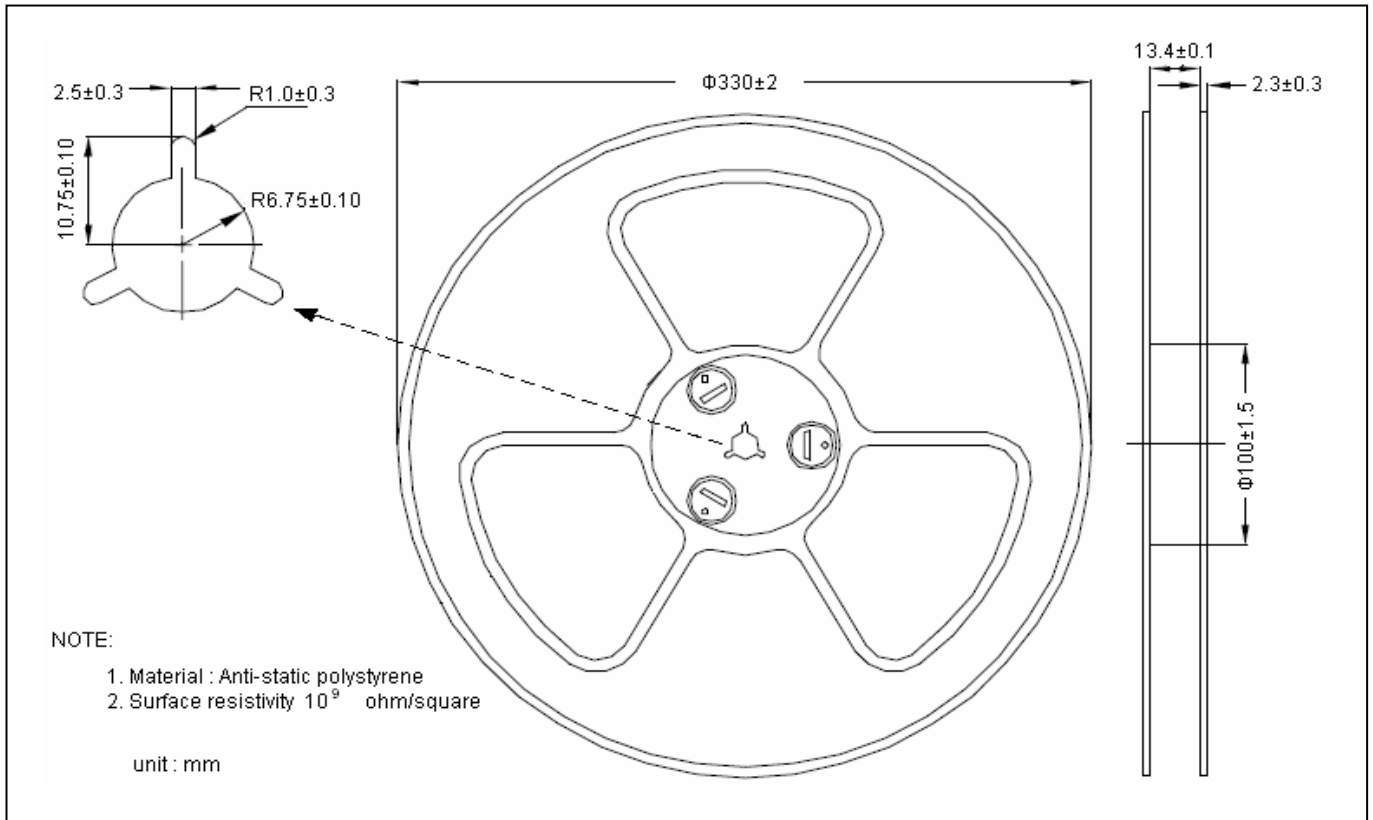




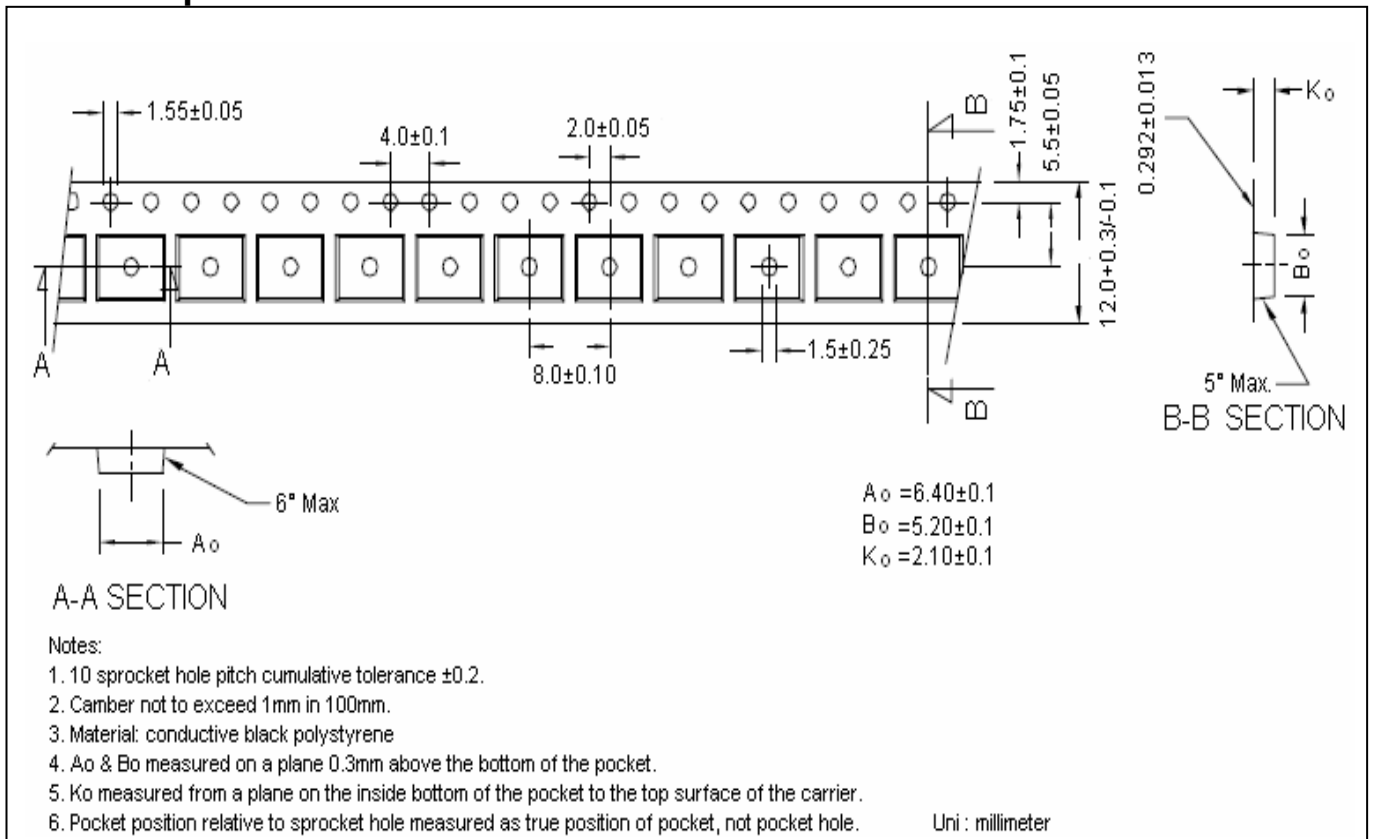
Characteristic Curves(Cont.)



Reel Dimension



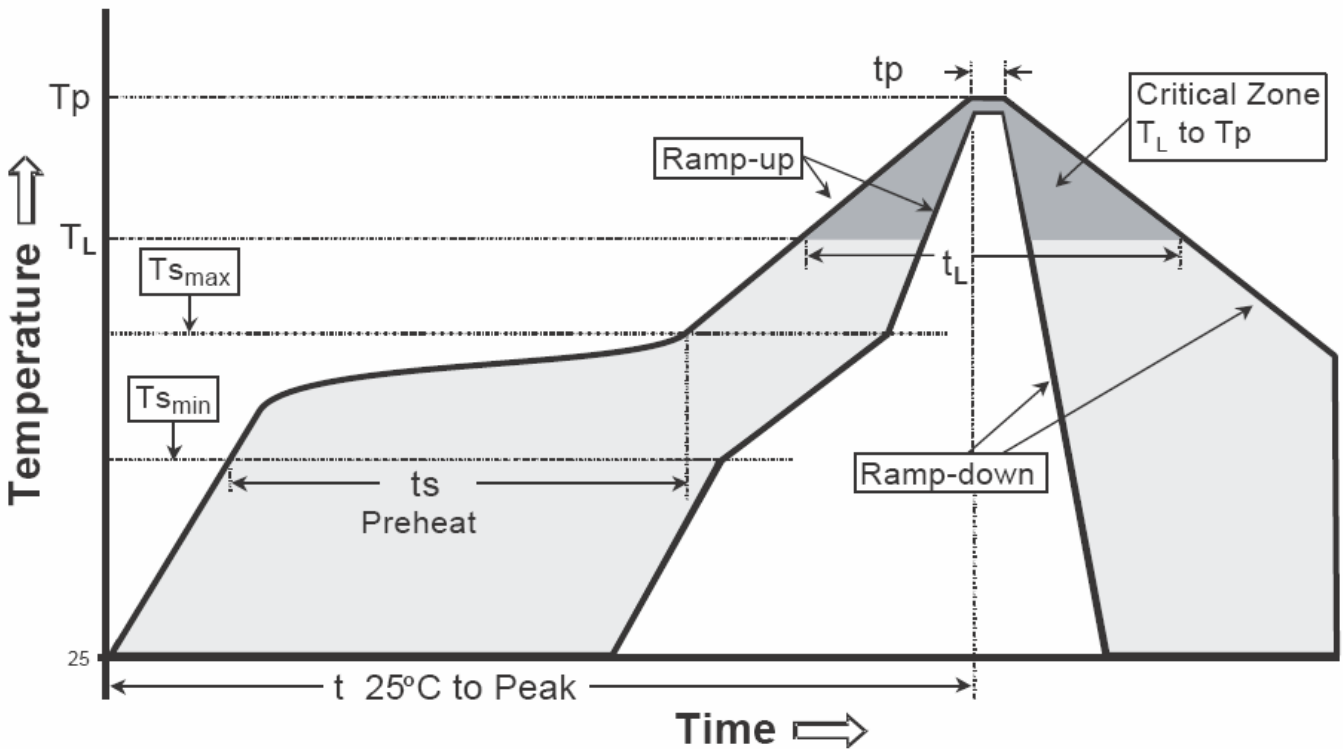
Carrier Tape Dimension



Recommended wave soldering condition

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

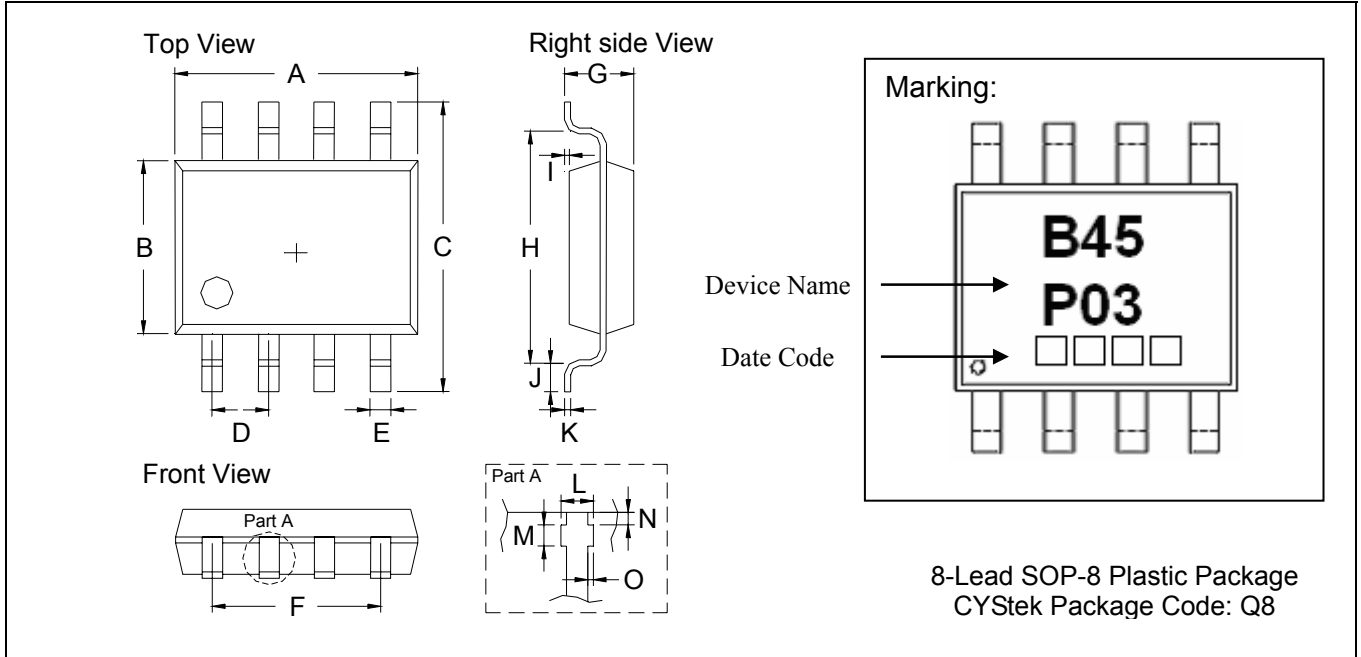
Recommended temperature profile for IR reflow



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	0.1850	0.2007	4.70	5.10	I	0.0031	0.0110	0.08	0.28
B	0.1457	0.1614	3.70	4.10	J	0.0157	0.0323	0.40	0.83
C	0.2283	0.2441	5.80	6.20	K	0.0074	0.0102	0.19	0.26
D	0.0500*		1.27*		L	0.0145	0.0204	0.37	0.52
E	0.0130	0.0201	0.33	0.51	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	0.0472	0.0638	1.20	1.62	O	0.0000	0.0059	0.00	0.15
H	0.1889	0.2007	4.80	5.10					

Notes: 1. Controlling dimension: millimeters.
 2. Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 3. 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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