

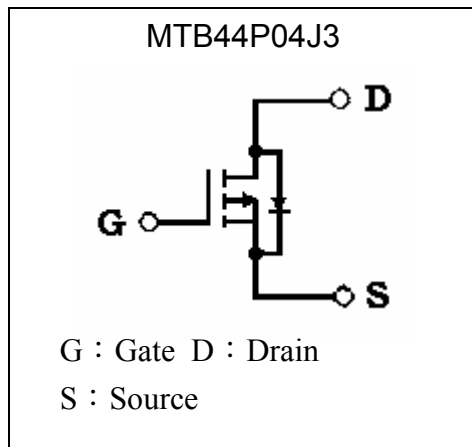
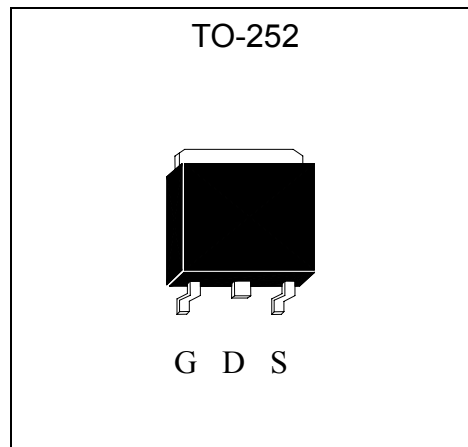
P-Channel Enhancement Mode Power MOSFET

MTB44P04J3

BV_{DSS}	-40V
I_D	-12A
$R_{DSON(MAX)}$	44m Ω

Features

- Low Gate Charge
- Simple Drive Requirement
- RoHS compliant & Halogen-free package

Equivalent Circuit

Outline

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

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current @ $T_C=25^\circ\text{C}$	I_D	-12	A
Continuous Drain Current @ $T_C=100^\circ\text{C}$	I_D	-8	
Pulsed Drain Current *1	I_{DM}	-48	
Avalanche Current	I_{AS}	-10	
Avalanche Energy @ $L=0.1\text{mH}$, $I_D=10\text{A}$, $R_G=25\Omega$	E_{AS}	5	mJ
Repetitive Avalanche Energy @ $L=0.05\text{mH}$ *2	E_{AR}	2	
Total Power Dissipation @ $T_C=25^\circ\text{C}$	P_d	36	W
Total Power Dissipation @ $T_C=100^\circ\text{C}$		12	
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55~+175	$^\circ\text{C}$

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

 *2. Duty cycle $\leq 1\%$



Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{th,j-c}	4.1	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{th,j-a}	80	°C/W

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-40	-	-	V	V _{GS} =0, I _D =-250μA
V _{GS(th)}	-1.8	-2.3	-3.2	V	V _{DS} =V _{GS} , I _D =-250μA
G _{FS} *1	-	11	-	S	V _{DS} =-5V, I _D =-10A
I _{GSS}	-	-	±100	nA	V _{GS} =±20, V _{DS} =0
I _{DSS}	-	-	-1	μA	V _{DS} =-32V, V _{GS} =0
	-	-	-25	μA	V _{DS} =-30V, V _{GS} =0, T _j =125°C
I _{D(ON)} *1	-12	-	-	A	V _{DS} =-5V, V _{GS} =-4.5V
R _{DS(ON)} *1	-	38	44	mΩ	V _{GS} =-10V, I _D =-10A
	-	50	70	mΩ	V _{GS} =-7V, I _D =-8A
Dynamic					
Q _g *1, 2	-	11.5	-	nC	I _D =-6A, V _{DS} =-10V, V _{GS} =-4.5V
Q _{gs} *1, 2	-	2.5	-		
Q _{gd} *1, 2	-	3.2	-		
t _{d(ON)} *1, 2	-	7	-	ns	V _{DS} =-10V, I _D =-1A, V _{GS} =-10V, R _G =6Ω
t _r *1, 2	-	10	-		
t _{d(OFF)} *1, 2	-	20	-		
t _f *1, 2	-	12	-		
C _{iss}	-	1223	-	pF	V _{GS} =0V, V _{DS} =-20V, f=1MHz
C _{oss}	-	405	-		
C _{rss}	-	366	-		
R _g	-	5.8	-	Ω	V _{GS} =15mV, V _{DS} =0, f=1MHz
Source-Drain Diode					
I _S *1	-	-	-12	A	
I _{SM} *3	-	-	-48		
V _{SD} *1	-	-	-1.3	V	I _F =I _S , V _{GS} =0V
t _{rr}	-	15	-	ns	I _F =-5A, dI _F /dt=100A/μs
Q _{rr}	-	8	-	nC	

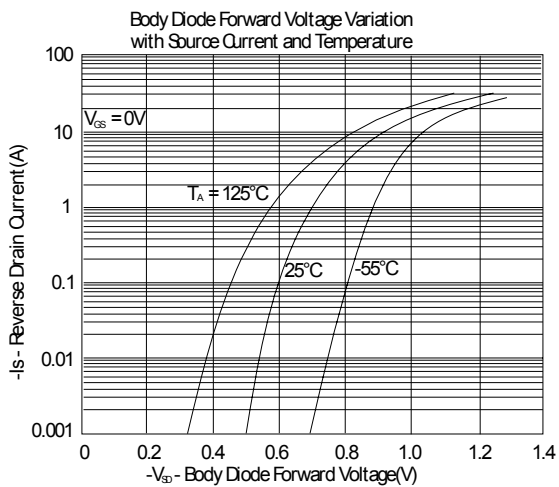
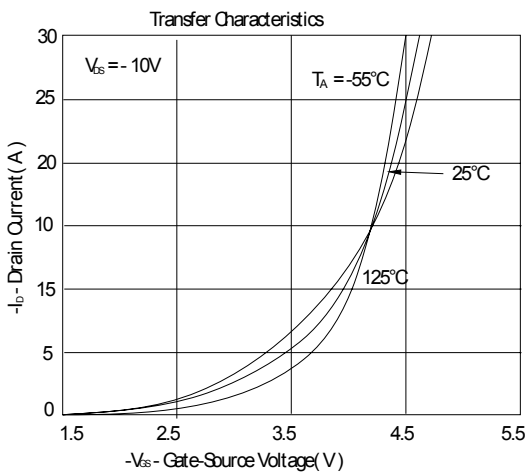
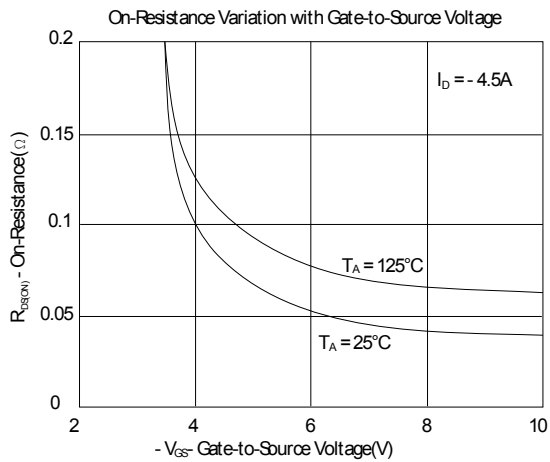
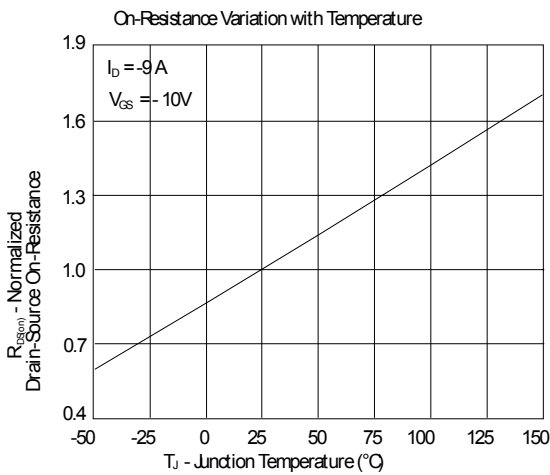
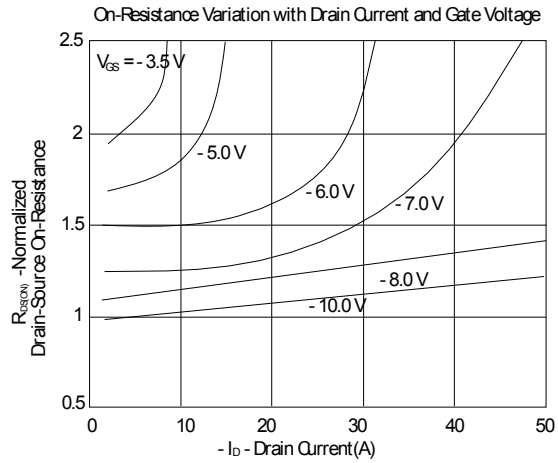
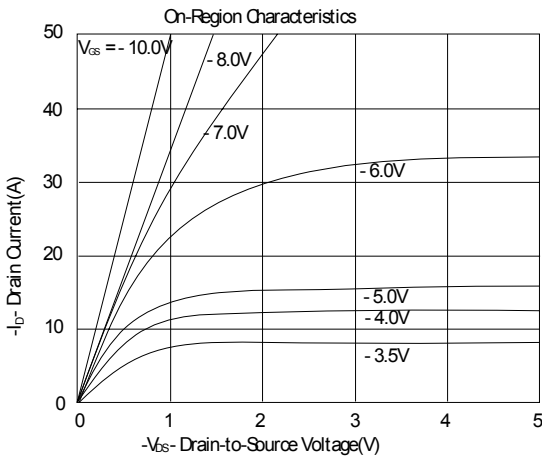
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
 *2.Independent of operating temperature
 *3.Pulse width limited by maximum junction temperature.

Ordering Information

Device	Package	Shipping	Marking
MTB44P04J3	TO-252 (RoHS compliant & Halogen-free package)	2500 pcs / Tape & Reel	B44P04

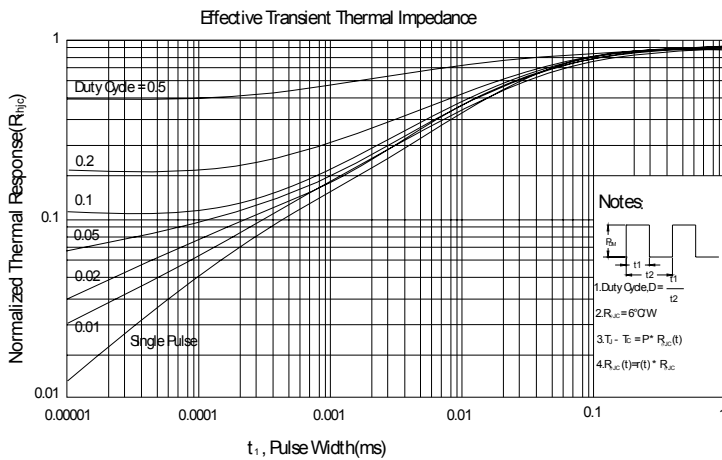
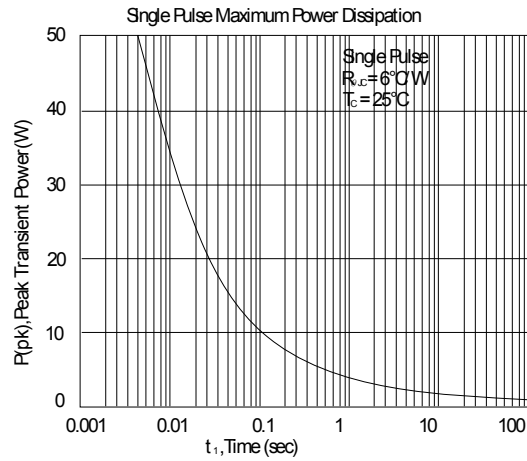
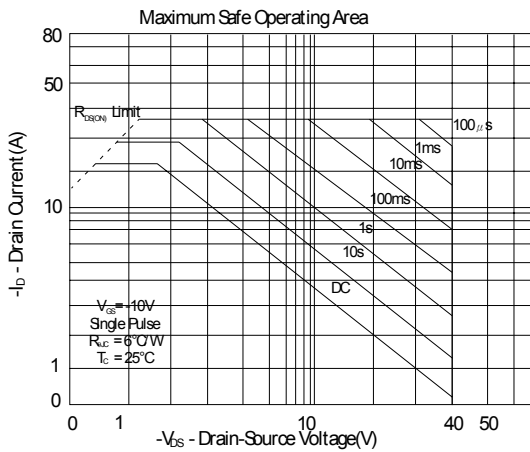
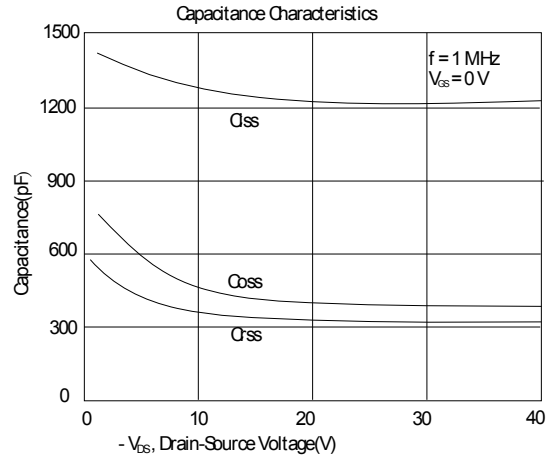
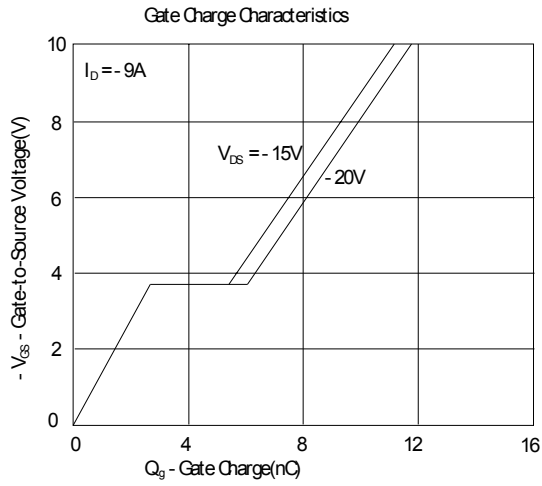


Characteristic Curves

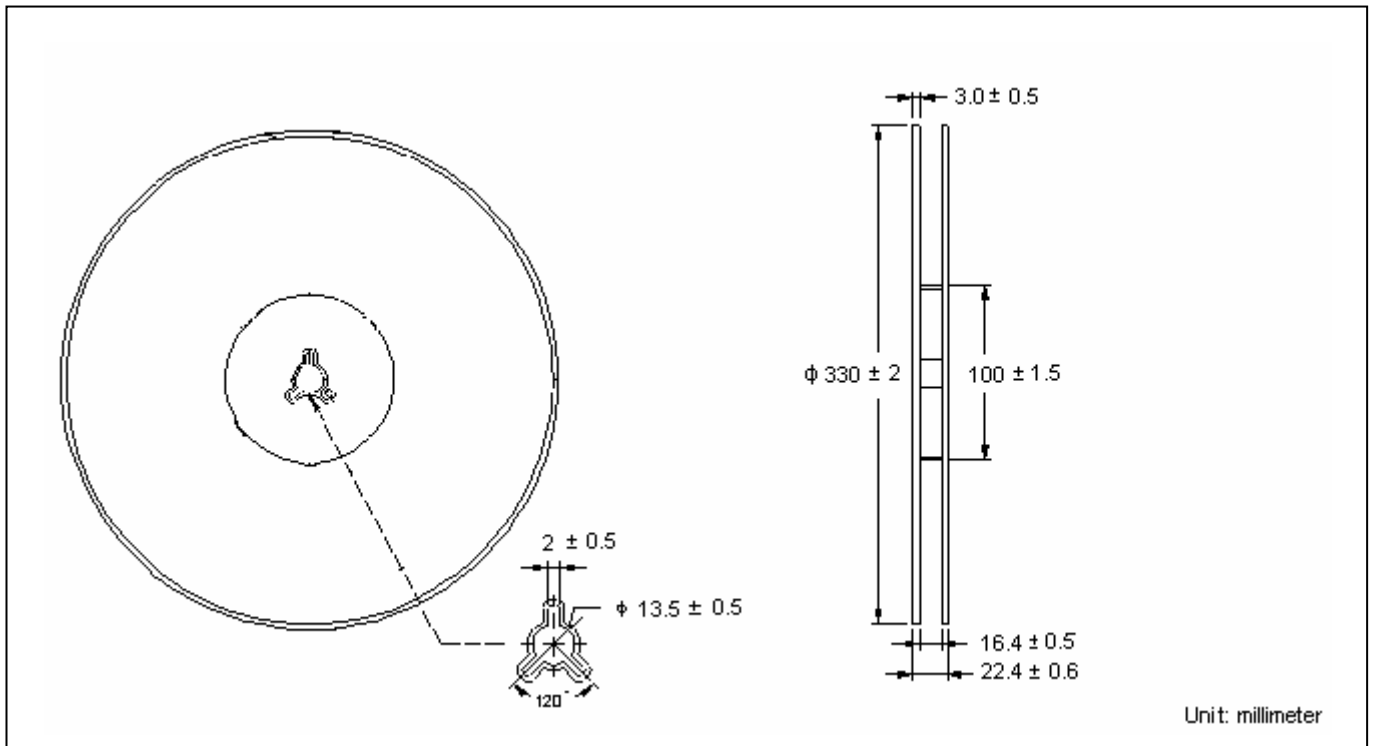




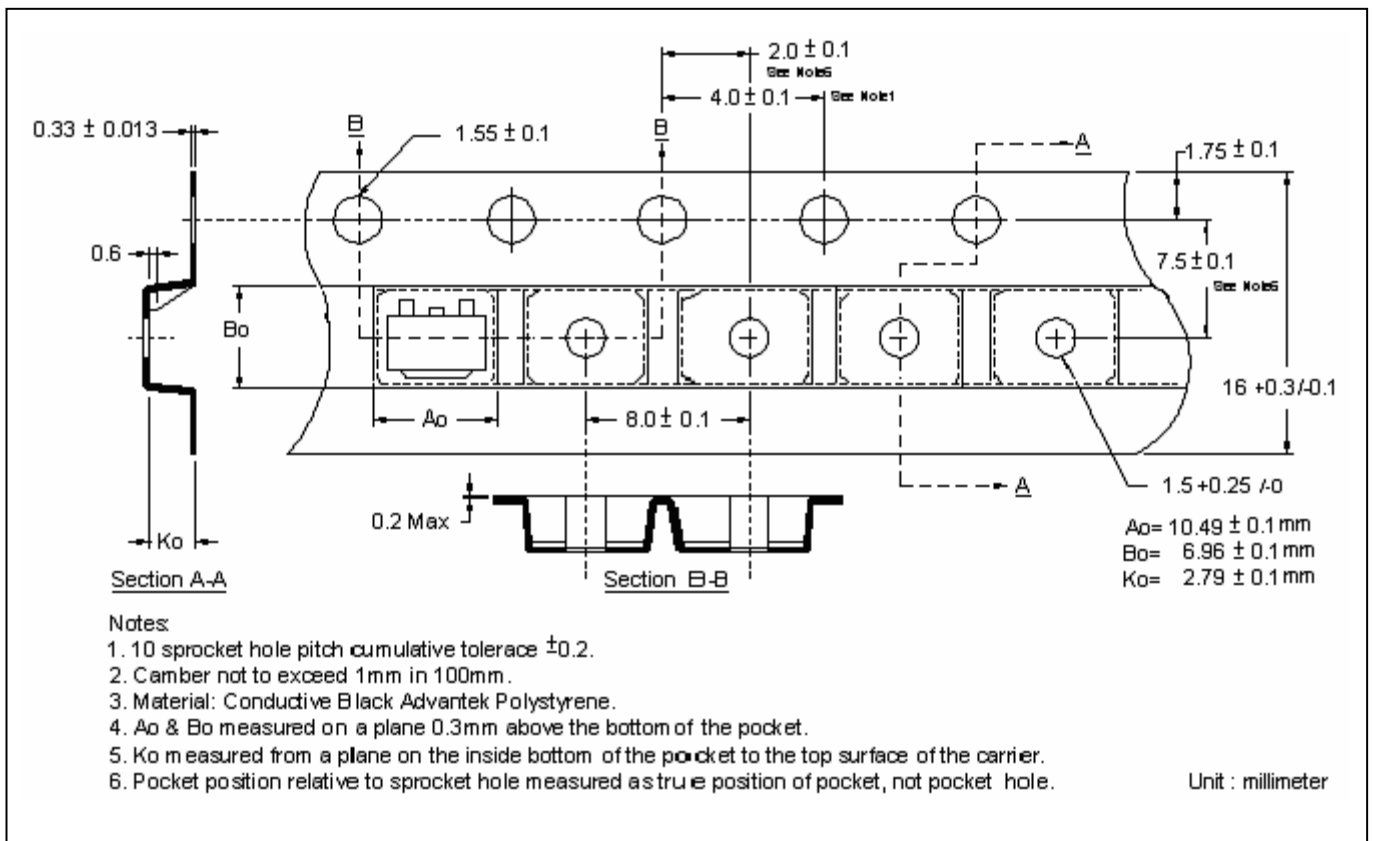
Characteristic Curves(Cont.)



Reel Dimension



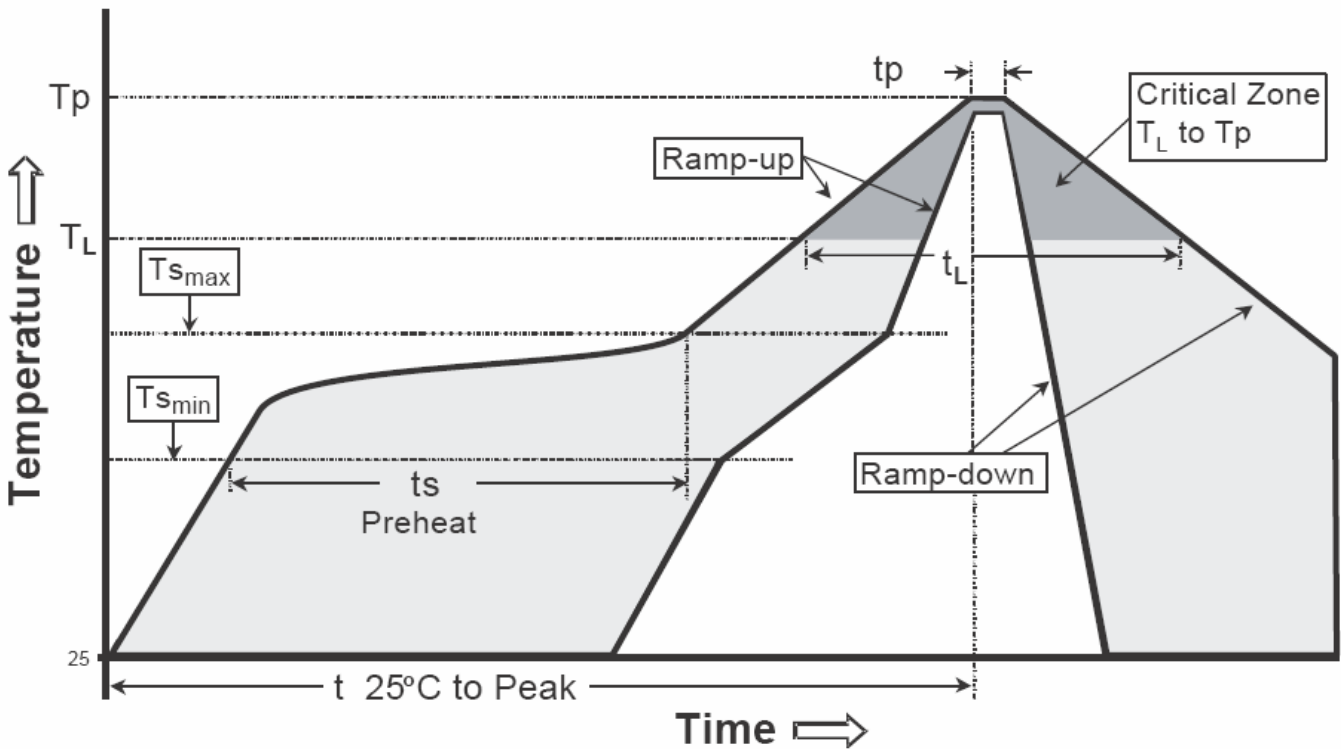
Carrier Tape Dimension



Recommended wave soldering condition

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

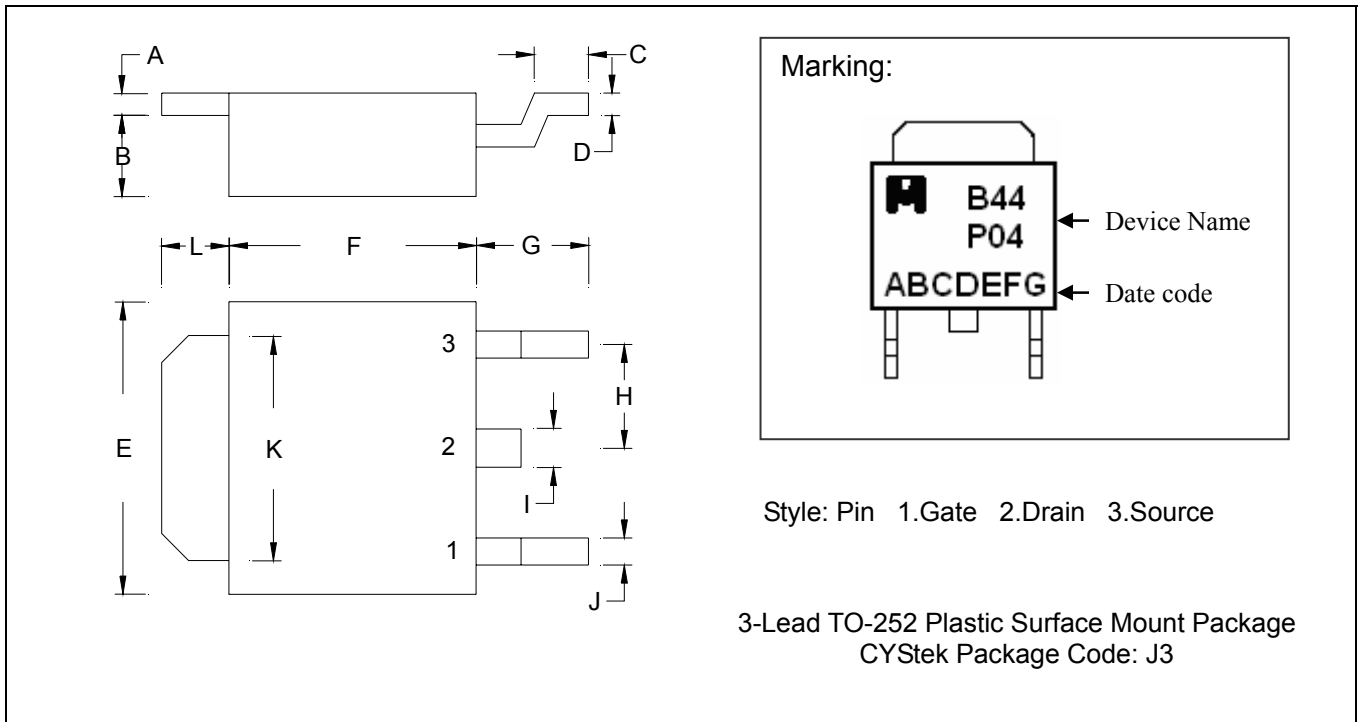
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _{s min})	100°C	150°C
-Temperature Max(T _{s max})	150°C	200°C
-Time(t _{s min} to t _{s max})	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T _L)	183°C	217°C
- Time (t _L)	60-150 seconds	60-150 seconds
Peak Temperature(T _P)	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.

TO-252 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0177	0.0217	0.45	0.55	G	0.0866	0.1102	2.20	2.80
B	0.0650	0.0768	1.65	1.95	H	-	*0.0906	-	*2.30
C	0.0354	0.0591	0.90	1.50	I	-	0.0449	-	1.14
D	0.0177	0.0236	0.45	0.60	J	-	0.0346	-	0.88
E	0.2441	0.2677	6.20	6.80	K	0.2047	0.2165	5.20	5.50
F	0.2125	0.2283	5.40	5.80	L	0.0551	0.0630	1.40	1.60

- 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 : KFC; pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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