N-Channel Enhancement Mode Power MOSFET

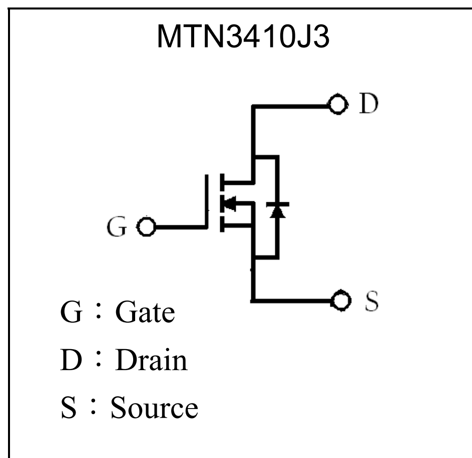
MTN3410J3

BV_{DSS}	100V
I_D	50A
$R_{DS(ON)}$	30mΩ

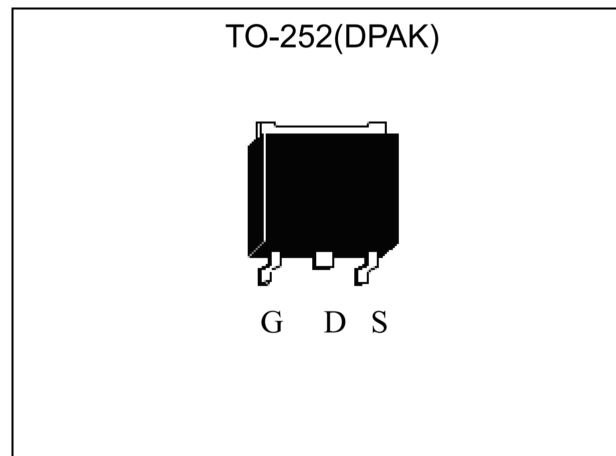
Features

- Low Gate Charge
- Simple Drive Requirement
- Repetitive Avalanche Rated
- Fast Switching Characteristic
- RoHS compliant package

Symbol

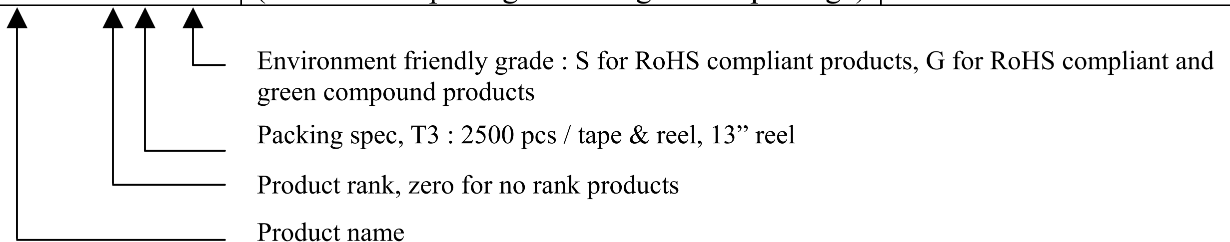


Outline



Ordering Information

Device	Package	Shipping
MTN3410J3-0-T3-G	TO-252 (Pb-free lead plating and halogen-free package)	2500 pcs / Tape & Reel



Absolute Maximum Ratings (T_C=25°C, unless otherwise noted)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±30	
Continuous Drain Current @V_{GS}=10V, T_C=25°C	I_D	50	A
Continuous Drain Current @V_{GS}=10V, T_C=100°C	I_D	35	
Pulsed Drain Current (Note 1)	I_{DM}	150	
Avalanche Current	I_{AS}	30	
Avalanche Energy @ L=0.1mH, I_D=30A, R_G=25Ω	E_{AS}	45	mJ
Repetitive Avalanche Energy@ L=0.05mH (Note 2)	E_{AR}	22.5	
Total Power Dissipation (T_C=25℃)	Pd	60	W
Linear Derating Factor		0.37	W/°C
Operating Junction and Storage Temperature	Tj, Tstg	-55~+175	°C

Note : 1. Pulse width limited by maximum junction temperature
2. Duty cycle ≤ 1%

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	2.5	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	75	°C/W

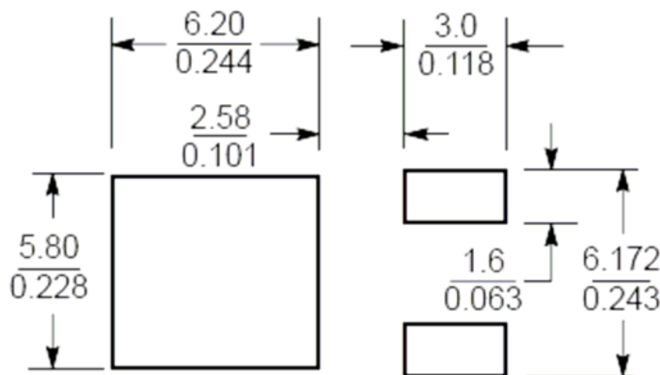
Characteristics (T_C=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	100	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	1.5	2.5	4.0	V	V_{DS} = V_{GS}, I_D=250μA
G_{FS}	-	38	-	S	V_{DS} =5V, I_D=30A
I_{GSS}	-	-	±100	nA	V_{GS}=±30
I_{DSS}	-	-	1	μA	V_{DS} =80V, V_{GS} =0V
	-	-	25	μA	V_{DS} =70V, V_{GS} =0V, Tj=125°C
*$R_{DS(ON)}$	-	22	30	mΩ	V_{GS} =10V, I_D=30A
*$I_{D(ON)}$	50	-	-	A	V_{DS} =10V, V_{GS} =10V
Dynamic					
*Qg	-	45	-	nC	I_D=30A, V_{DS}=80V, V_{GS}=10V
*Qgs	-	15	-		
*Qgd	-	25	-		
*$t_{d(ON)}$	-	25	-	ns	V_{DS}=50V, I_D=1A, V_{GS}=10V, R_G=6Ω
*t_r	-	200	-		
*$t_{d(OFF)}$	-	100	-		
*t_f	-	120	-		

C_{iss}	-	9600	-	pF	V_{GS}=0V, V_{DS}=25V, f=1MHz
C_{oss}	-	275	-		
C_{rss}	-	197	-		
R_g	-	2	-	Ω	V_{GS}=15mV, V_{DS}=0V, f=1MHz
Source-Drain Diode					
$*I_S$	-	-	50	A	
$*I_{SM}$	-	-	150		
$*V_{SD}$	-	-	1.3	V	I_F=I_S, V_{GS}=0V
$*t_{rr}$	-	120	-	ns	I_F=25A, V_{GS}=0, dI/dt=100A/μs
$*Q_{rr}$	-	380	-	nC	

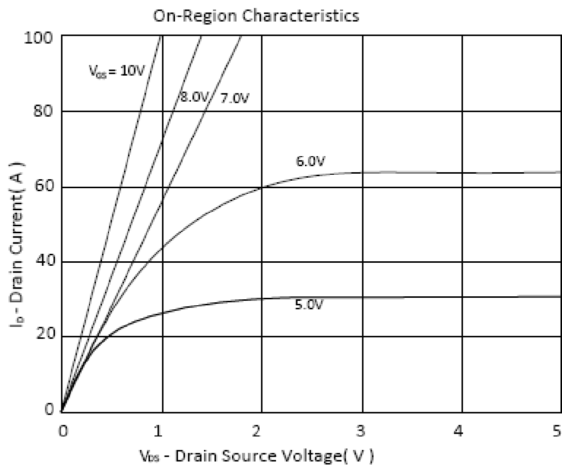
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

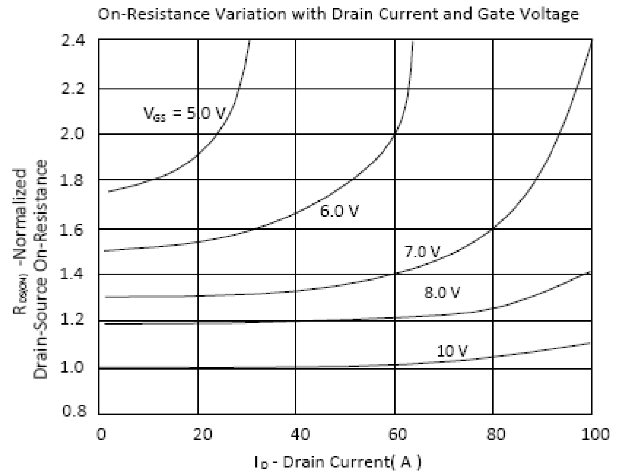
Recommended soldering footprint

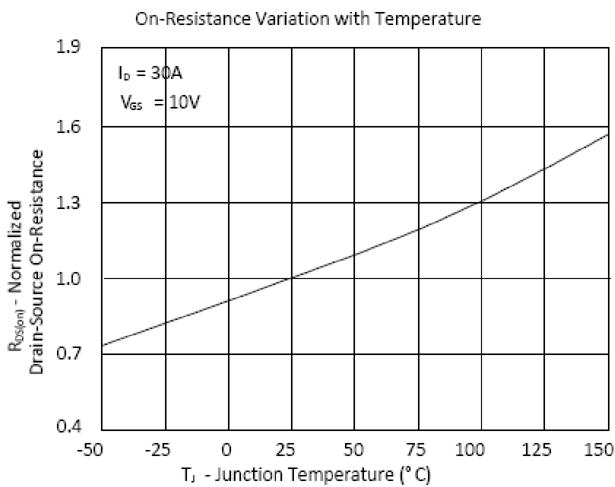


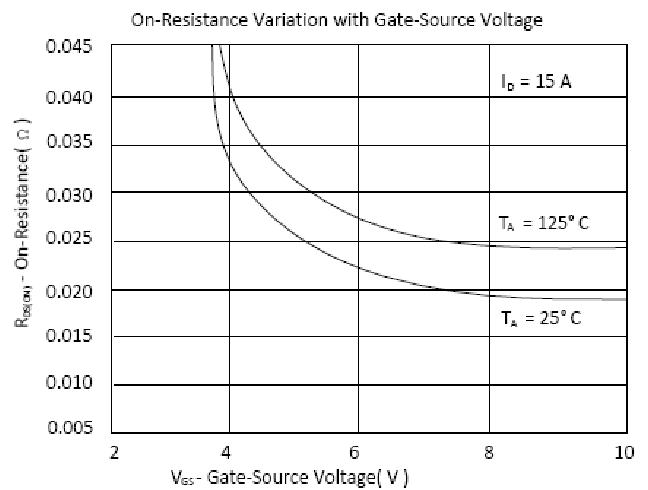
Unit (mm / inch)

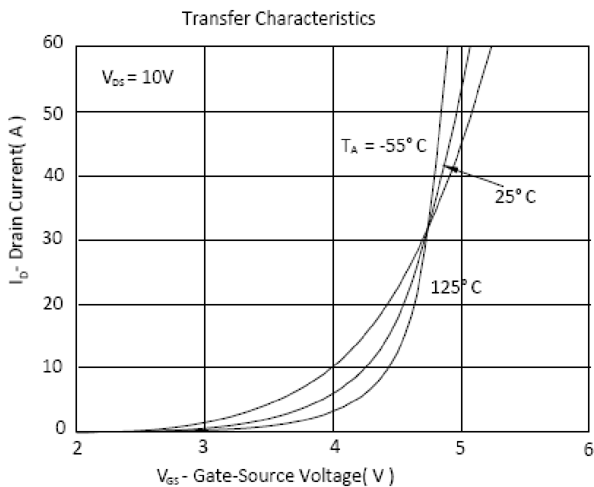
Characteristic Curves

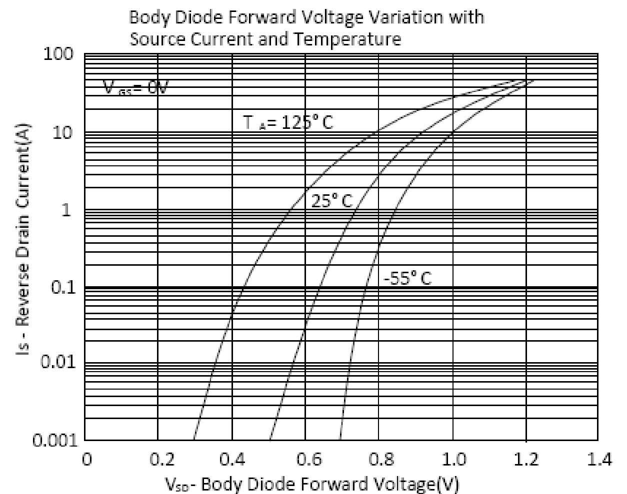




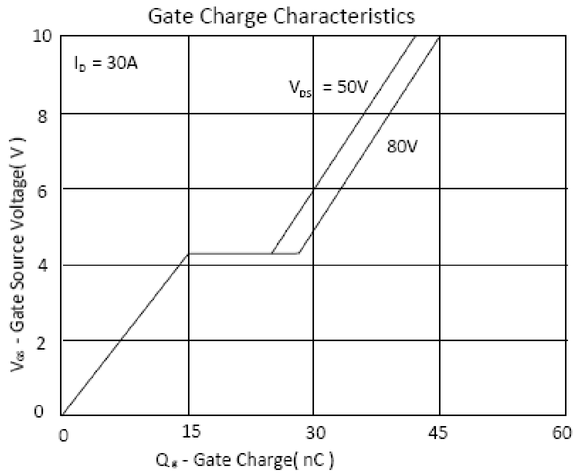


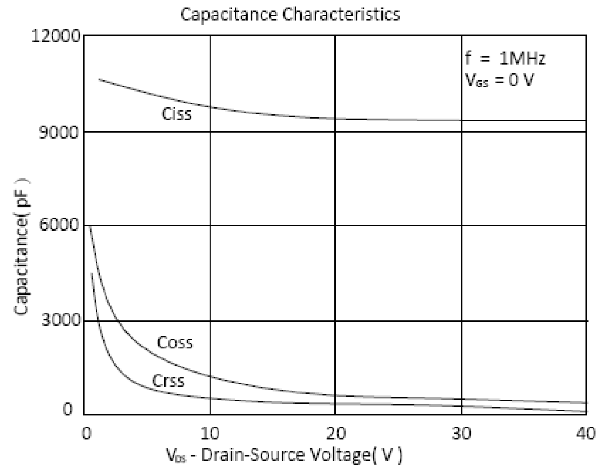


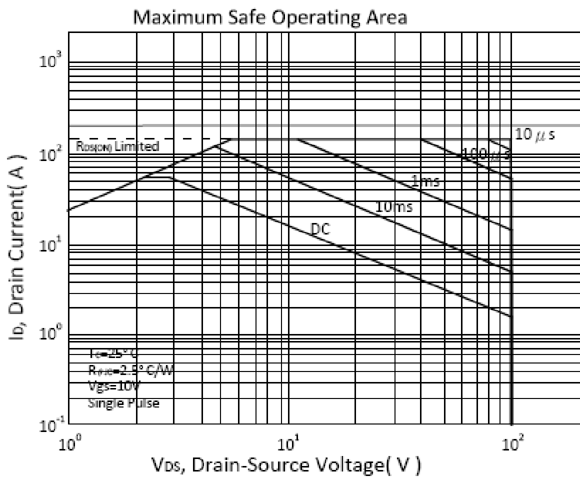


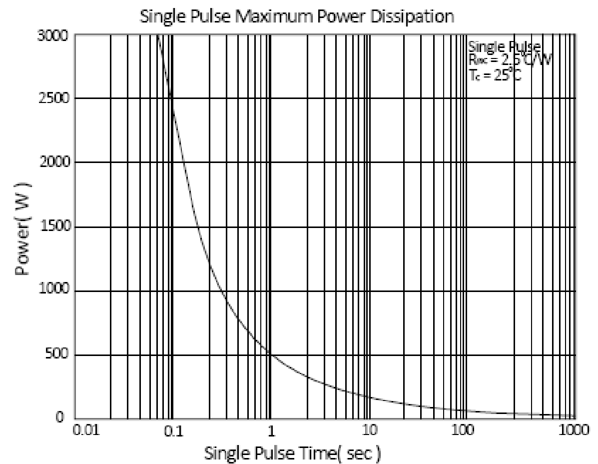


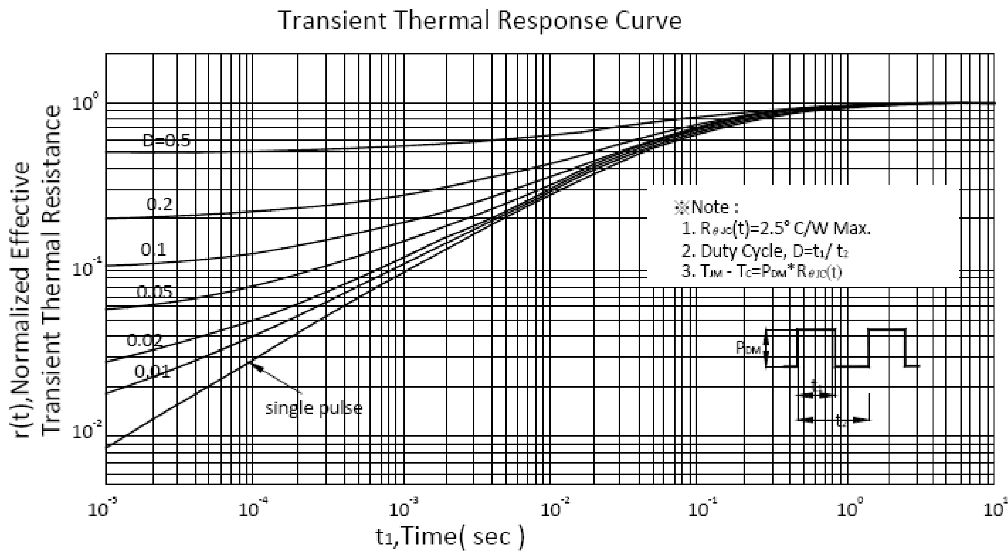
Characteristic Curves(Cont.)











Reel Dimension

16.4±1
Φ21±1
Φ13±1
100±1
21±1
330±2
unit : mm

Carrier Tape Dimension

0.30±0.05
0.60±0.10
Φ1.55±0.05
4.00±0.10
2.00±0.10
1.75±0.10
3.00±0.10
1.20±0.10
4° MAX
10.50±0.10
R0.30 MAX
R0.50
7.50±0.10
16.00±0.10
45°
1.70±0.10
2.50±0.10
2.70±0.10
2.00±0.10
8.00±0.10
Φ1.55±0.05
B – B
6° MAX
6.90±0.10
A – A

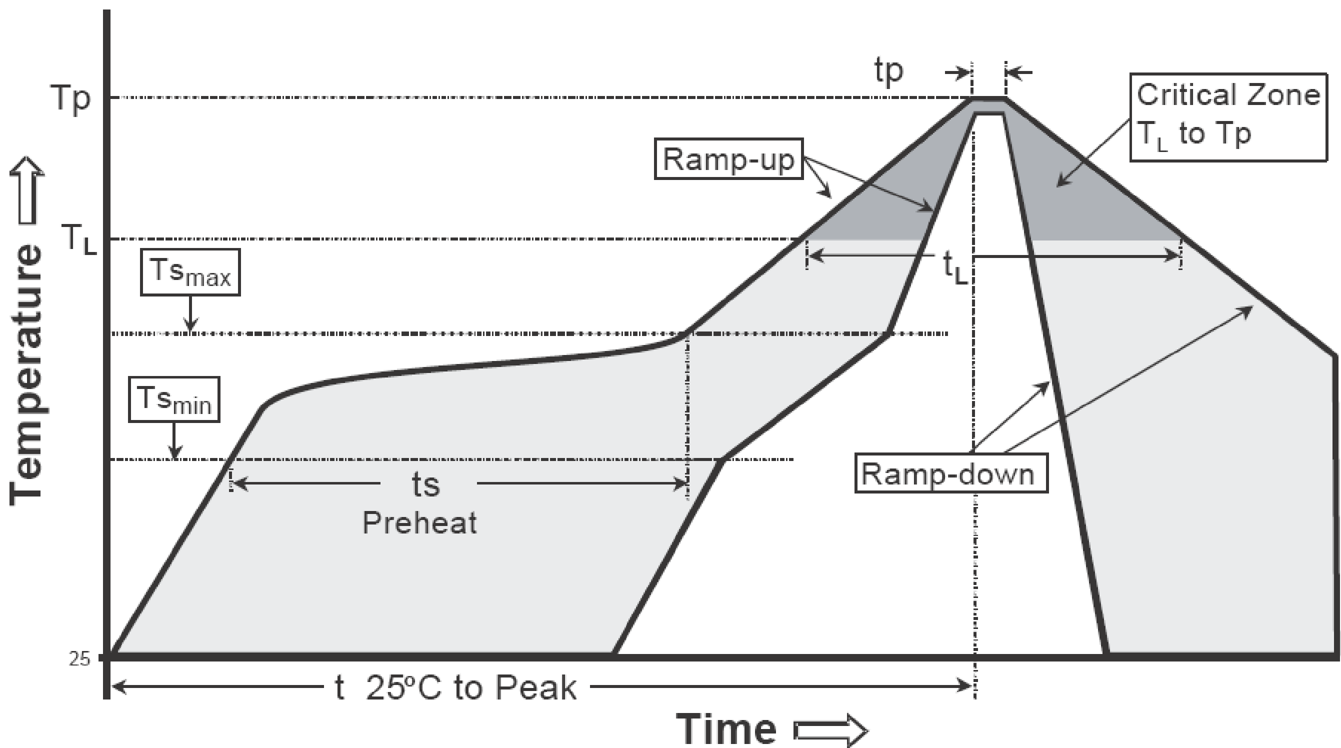
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene, antistatic coated : 10^{5} Ω/□~ 10^{11} Ω/□

unit : mm

Recommended wave soldering condition

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

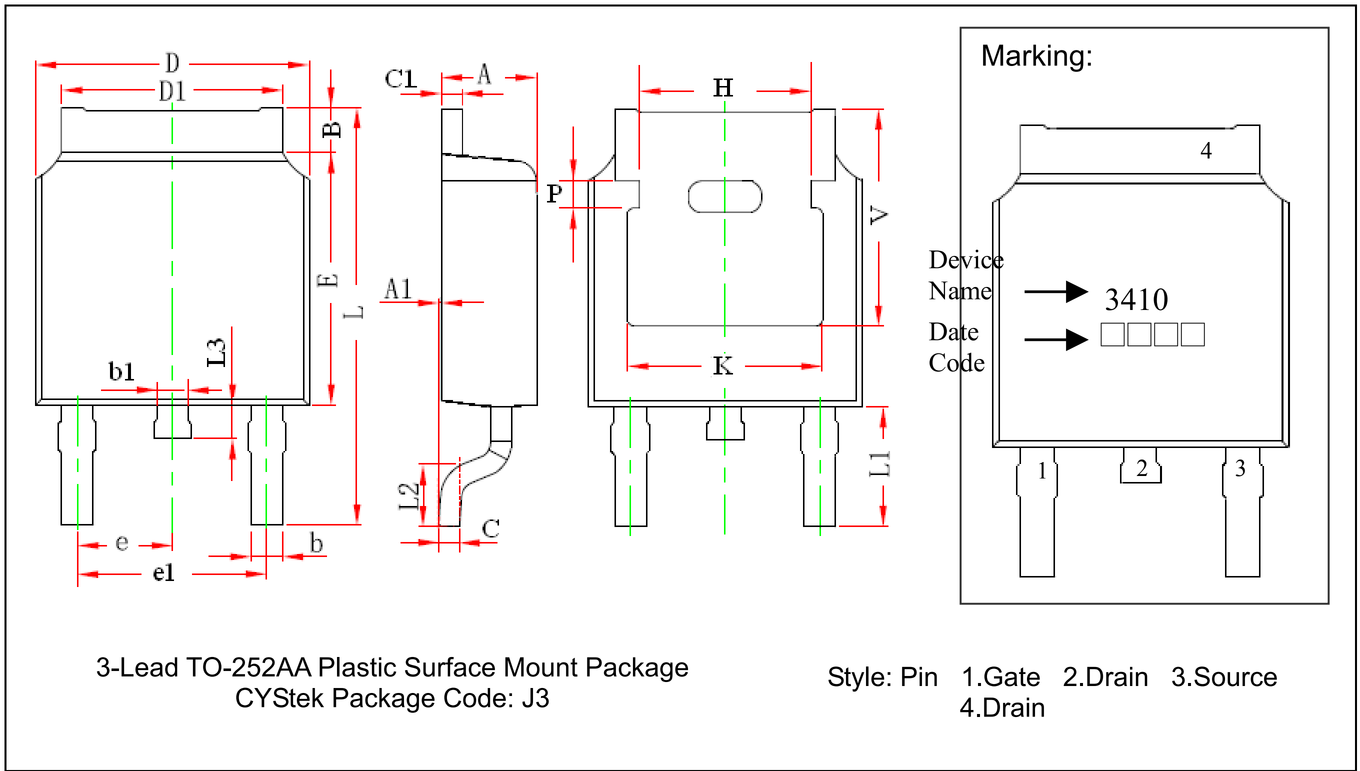
Recommended temperature profile for IR reflow



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(T_S min) −Temperature Max(T_S max) −Time(ts_{min} to ts_{max})	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 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-252AA Dimension



3-Lead TO-252AA Plastic Surface Mount Package
CYStek Package Code: J3

Style: Pin 1.Gate 2.Drain 3.Source 4.Drain

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.087	0.094	2.200	2.400	e	0.086	0.094	2.186	2.386
A1	0.000	0.005	0.000	0.127	e1	0.172	0.188	4.372	4.772
B	0.039	0.048	0.990	1.210	H	0.163	REF	4.140	REF
b	0.026	0.034	0.660	0.860	K	0.190	REF	4.830	REF
b1	0.026	0.034	0.660	0.860	L	0.386	0.409	9.800	10.400
C	0.018	0.023	0.460	0.580	L1	0.114	REF	2.900	REF
C1	0.018	0.023	0.460	0.580	L2	0.055	0.067	1.400	1.700
D	0.256	0.264	6.500	6.700	L3	0.024	0.039	0.600	1.000
D1	0.201	0.215	5.100	5.460	P	0.026	REF	0.650	REF
E	0.236	0.244	6.000	6.200	V	0.211	REF	5.350	REF

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.

Important Notice:

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of CYStek.
- CYStek reserves the right to make changes to its products without notice.
- CYStek ***semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.***
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.