N-Channel Enhancement Mode Power MOSFET

MTN2572F3

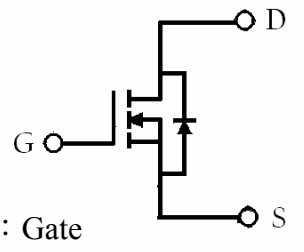
BV_{DSS}	150V
I_D	48A
$R_{DS(ON)}$	50mΩ

Features

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

Symbol

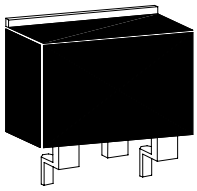
MTN2572F3



G：Gate
D：Drain
S：Source

Outline

TO-263



G D S

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

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current @V_{GS}=10V, T_C=25°C		I_D	48	A
Continuous Drain Current @V_{GS}=10V, T_C=100°C		I_D	30	
Pulsed Drain Current (Note 1)		I_{DM}	140	
Avalanche Current		I_{AS}	18	
Avalanche Energy @ L=0.2mH, I_D=18A, R_G=25Ω		E_{AS}	32.4	mJ
Repetitive Avalanche Energy@ L=0.1mH (Note 2)		E_{AR}	16.2	
Power Dissipation	T_C=25℃	P_D	125	W
	T_C=100℃		57	
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	$R_{th,j-c}$	1.2	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	62.5	°C/W

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	150	-	-	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}	-	40	-	S	V_{DS} =5V, I_D=20A
I_{GSS}	-	-	±100	nA	V_{GS}=±30
I_{DSS}	-	-	1	μA	V_{DS} =120V, V_{GS} =0V
	-	-	25	μA	V_{DS} =100V, V_{GS} =0V, Tj=125°C
*$R_{DS(ON)}$	-	40	50	mΩ	V_{GS} =10V, I_D=20A
*$I_{D(ON)}$	48	-	-	A	V_{DS} =10V, V_{GS} =10V
Dynamic					
*Qg	-	30	-	nC	I_D=20A, V_{DS}=80V, V_{GS}=10V
*Qgs	-	10	-		
*Qgd	-	8	-		
*$t_{d(ON)}$	-	20	-	ns	V_{DS}=75V, I_D=1A, V_{GS}=10V, R_G=6Ω
*tr	-	18	-		
*$t_{d(OFF)}$	-	40	-		
*t_f	-	18	-		
Ciss	-	1963	-	pF	V_{GS}=0V, V_{DS}=25V, f=1MHz
Coss	-	195	-		
Crss	-	65	-		
Rg	-	2	-	Ω	V_{GS}=15mV, V_{DS}=0V, f=1MHz
Source-Drain Diode					
*I_S	-	-	48	A	
*I_{SM}	-	-	140		
*V_{SD}	-	-	1.3	V	I_F=I_S, V_{GS}=0V
*trr	-	120	-	ns	I_F=25A, V_{GS}=0, dI_F/dt=100A/μs
*Qrr	-	380	-	nC	

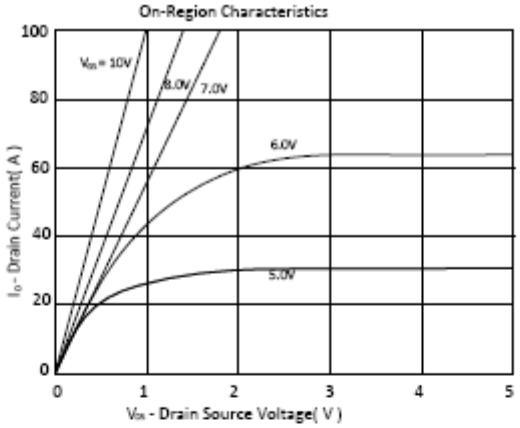
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Ordering Information

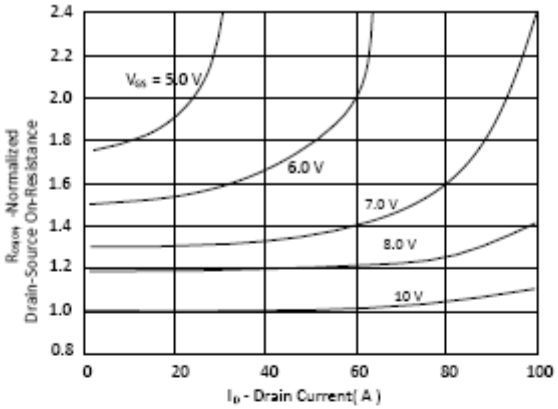
Device	Package	Shipping
MTN2572F3	TO-263 (RoHS compliant package)	800 pcs / Tape & Reel

Characteristic Curves

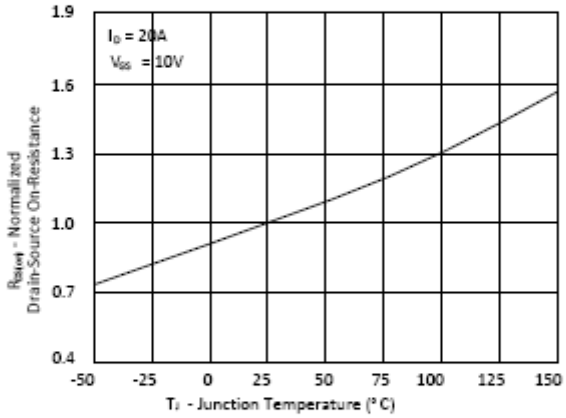
On-Region Characteristics



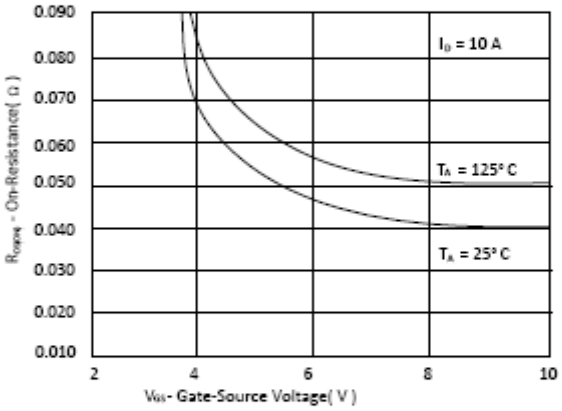
On-Resistance Variation with Drain Current and Gate Voltage



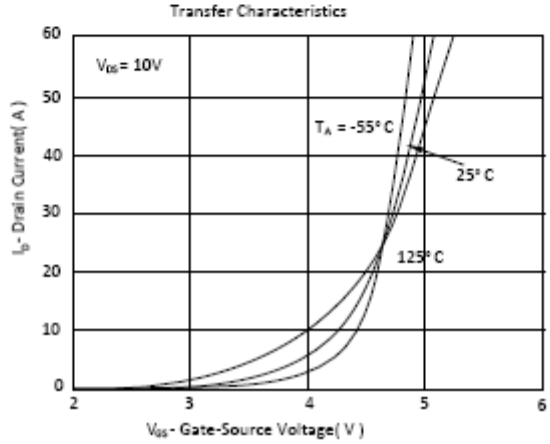
On-Resistance Variation with Temperature



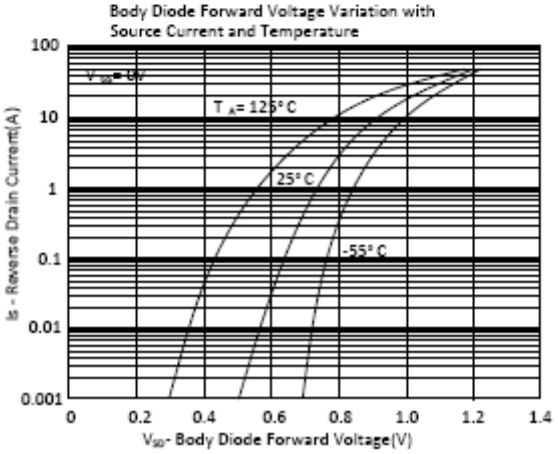
On-Resistance Variation with Gate-Source Voltage



Transfer Characteristics

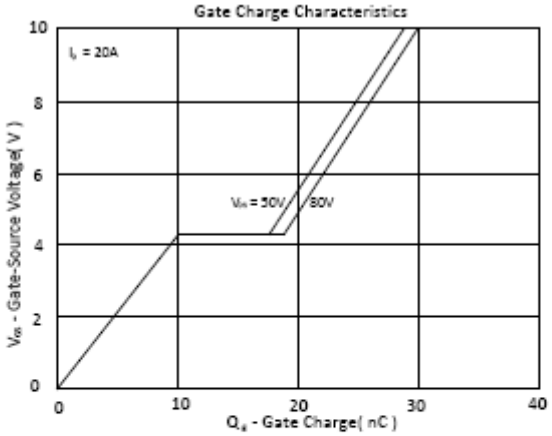


Body Diode Forward Voltage Variation with Source Current and Temperature

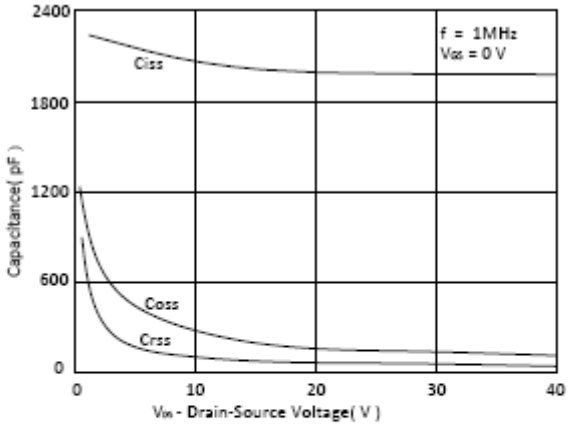


Characteristic Curves(Cont.)

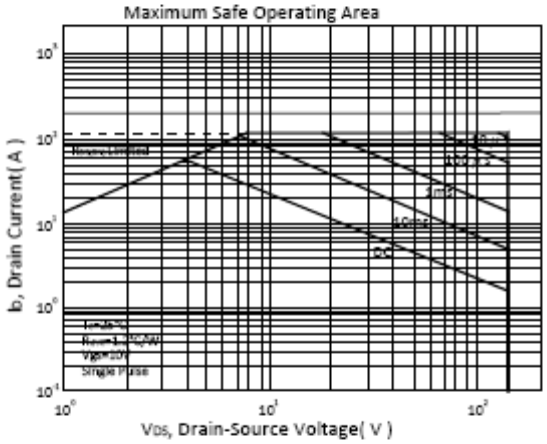
Gate Charge Characteristics



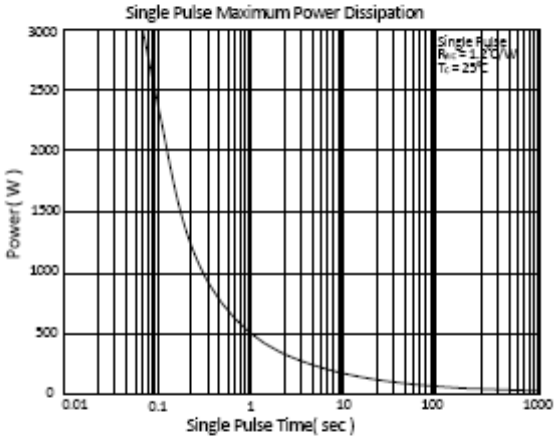
Capacitance Characteristics



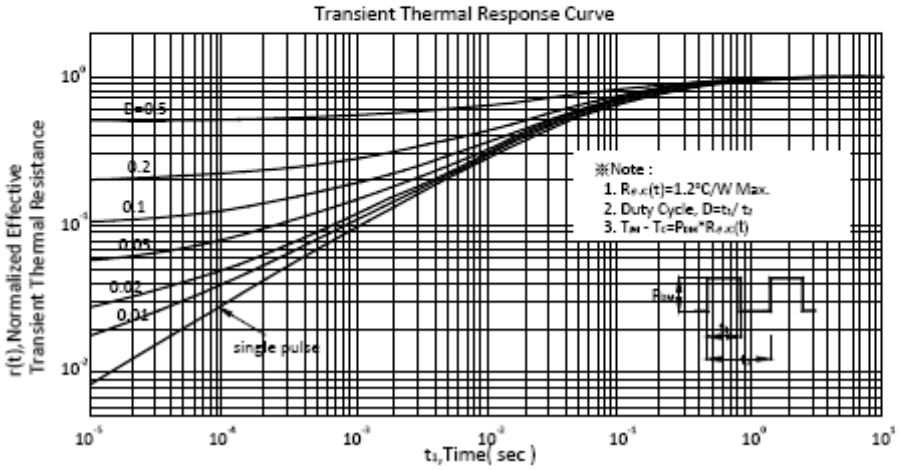
Maximum Safe Operating Area



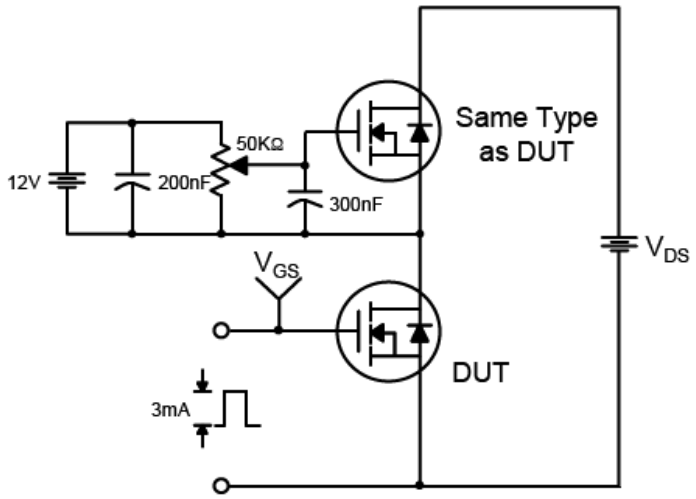
Single Pulse Maximum Power Dissipation

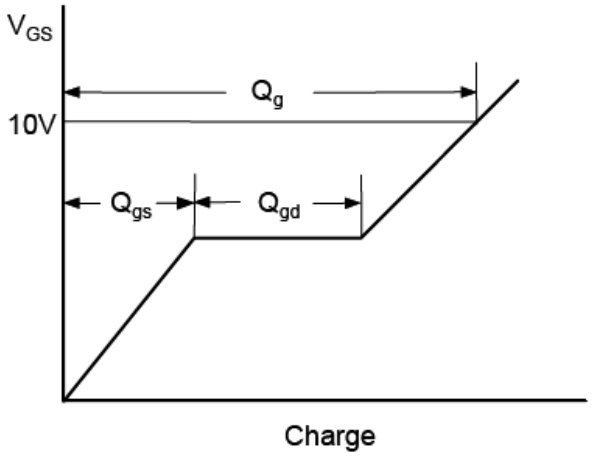


Transient Thermal Response Curve

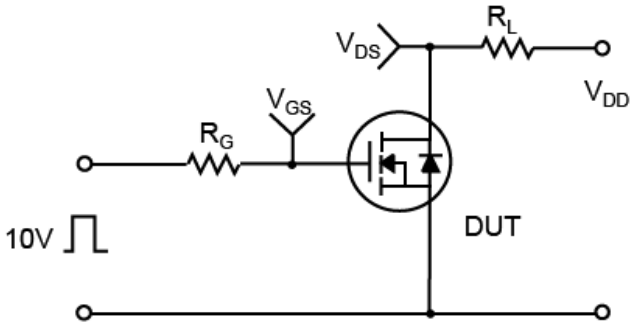


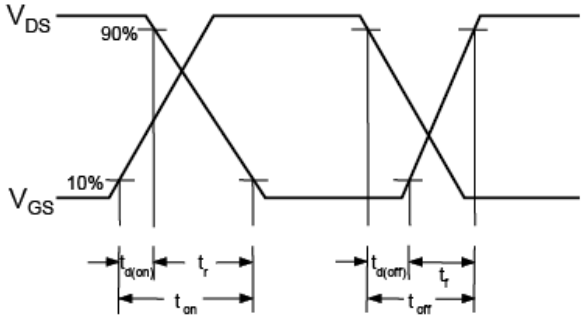
Test Circuit and Waveforms



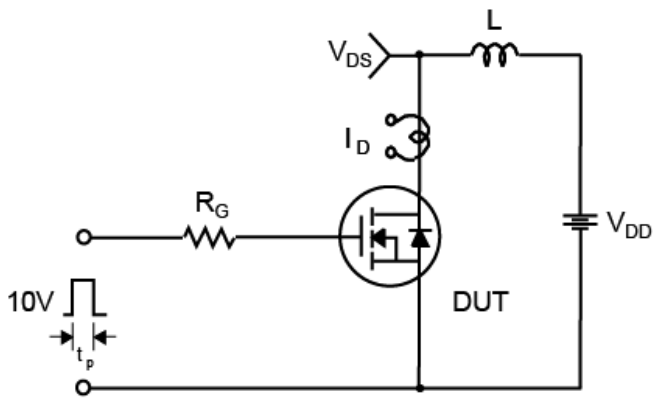


Resistive Switching Test Circuit & Waveforms

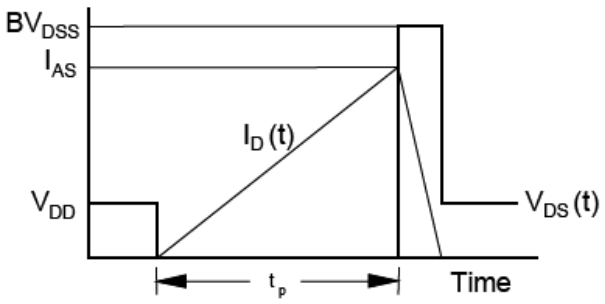




Unclamped Inductive Switching Test Circuit & Waveforms

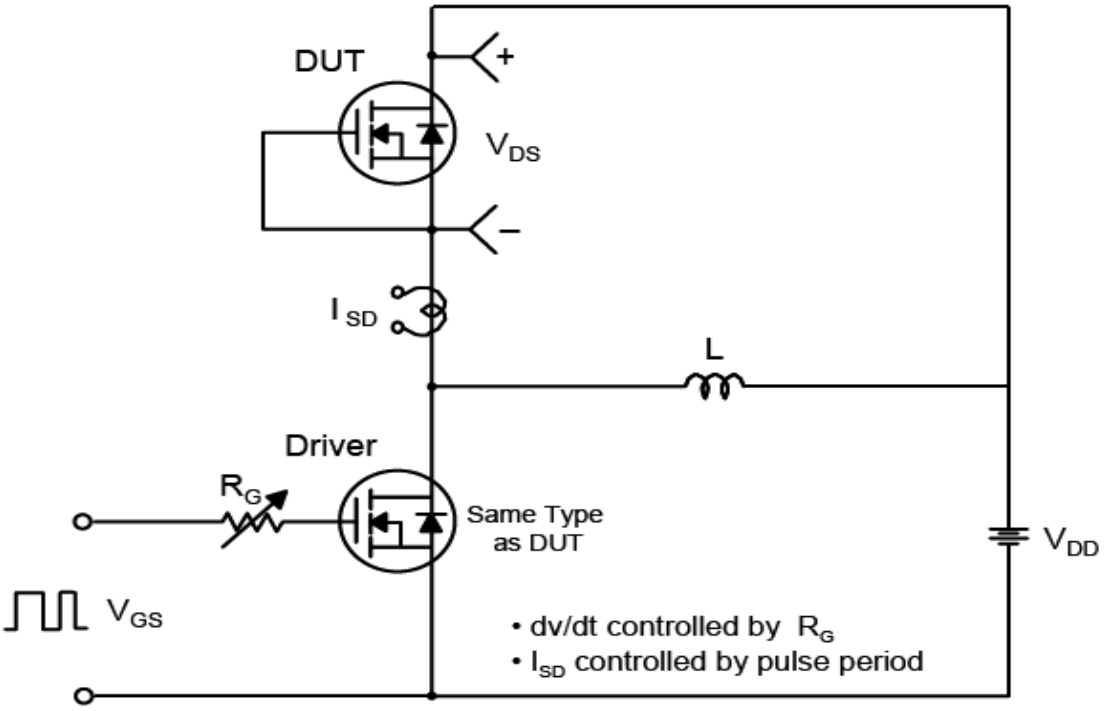


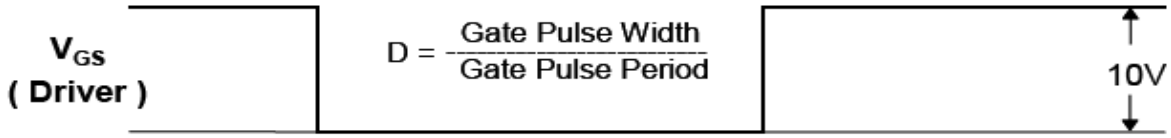
$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

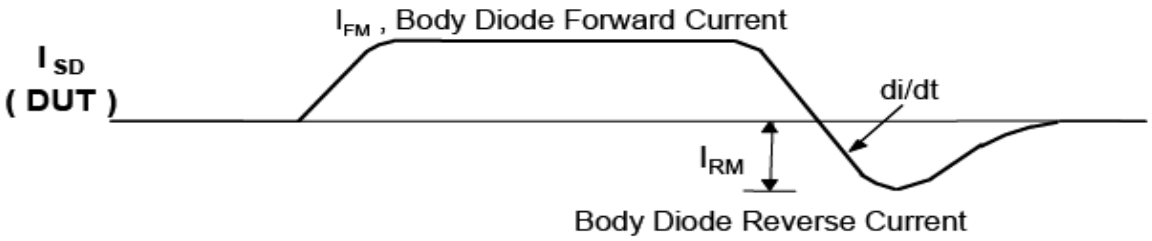


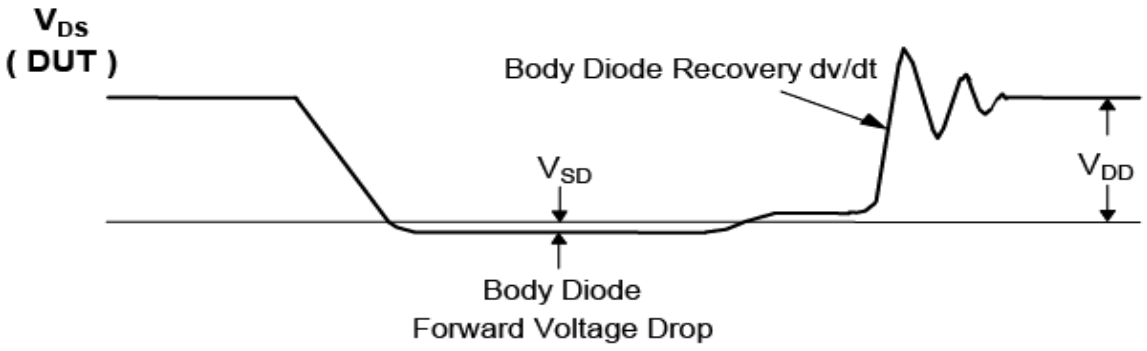
Test Circuit and Waveforms(Cont.)

Peak Diode Recovery dv/dt Test Circuit & Waveforms

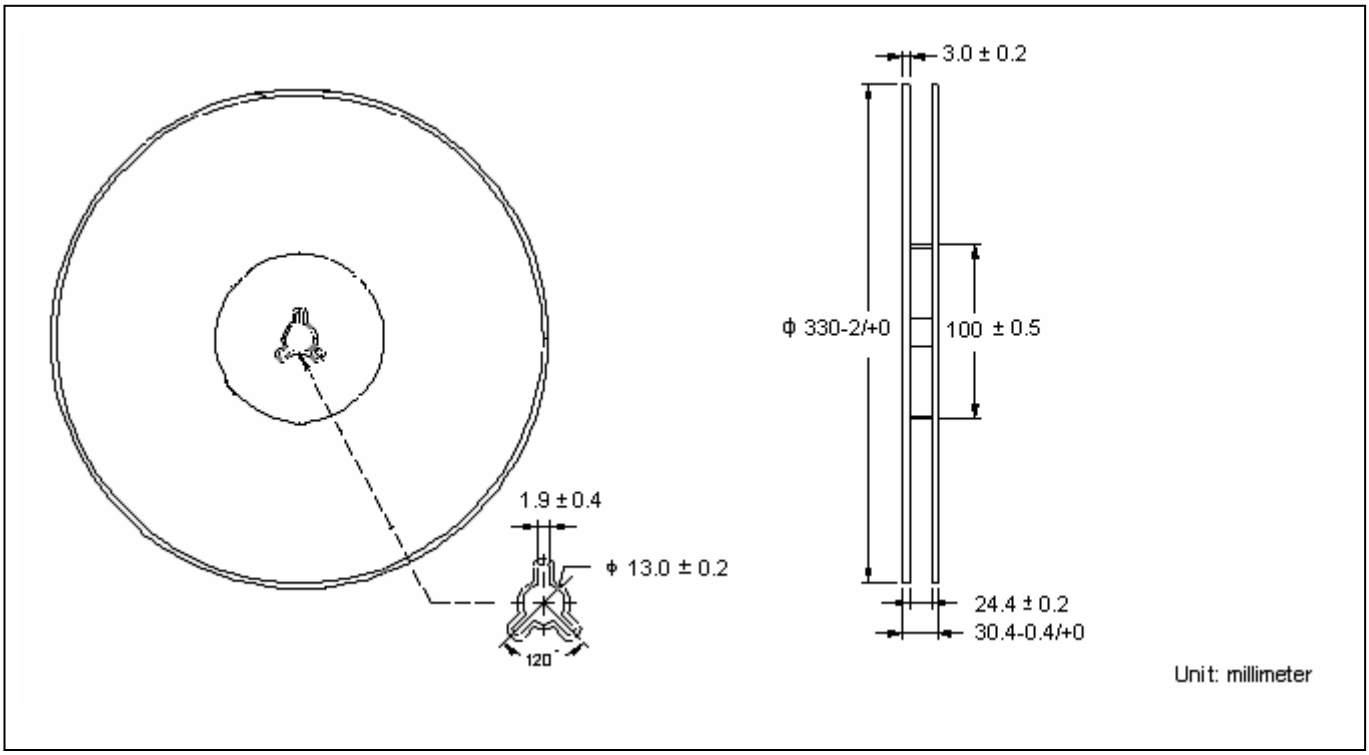




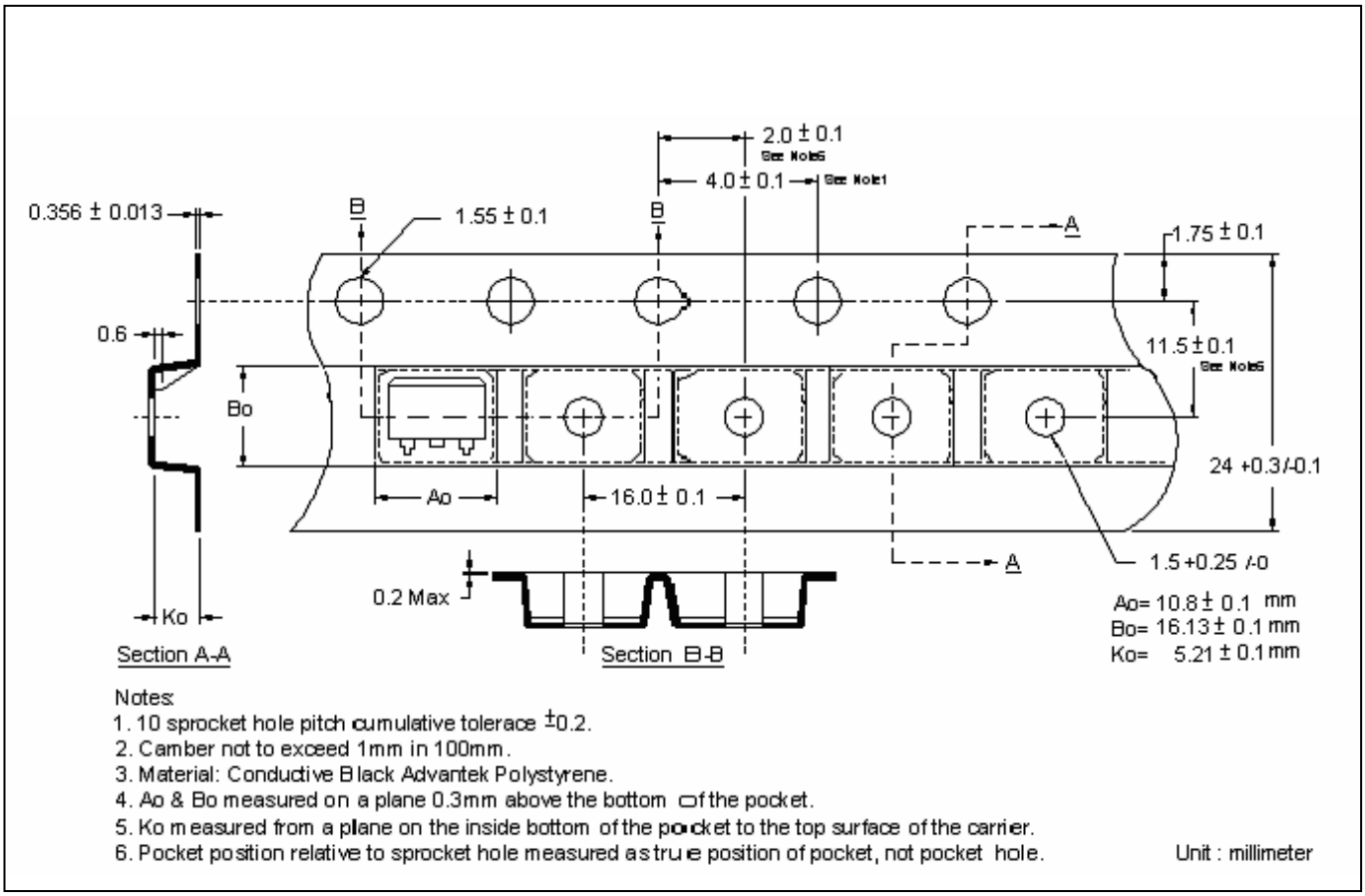




Reel Dimension



Carrier Tape Dimension



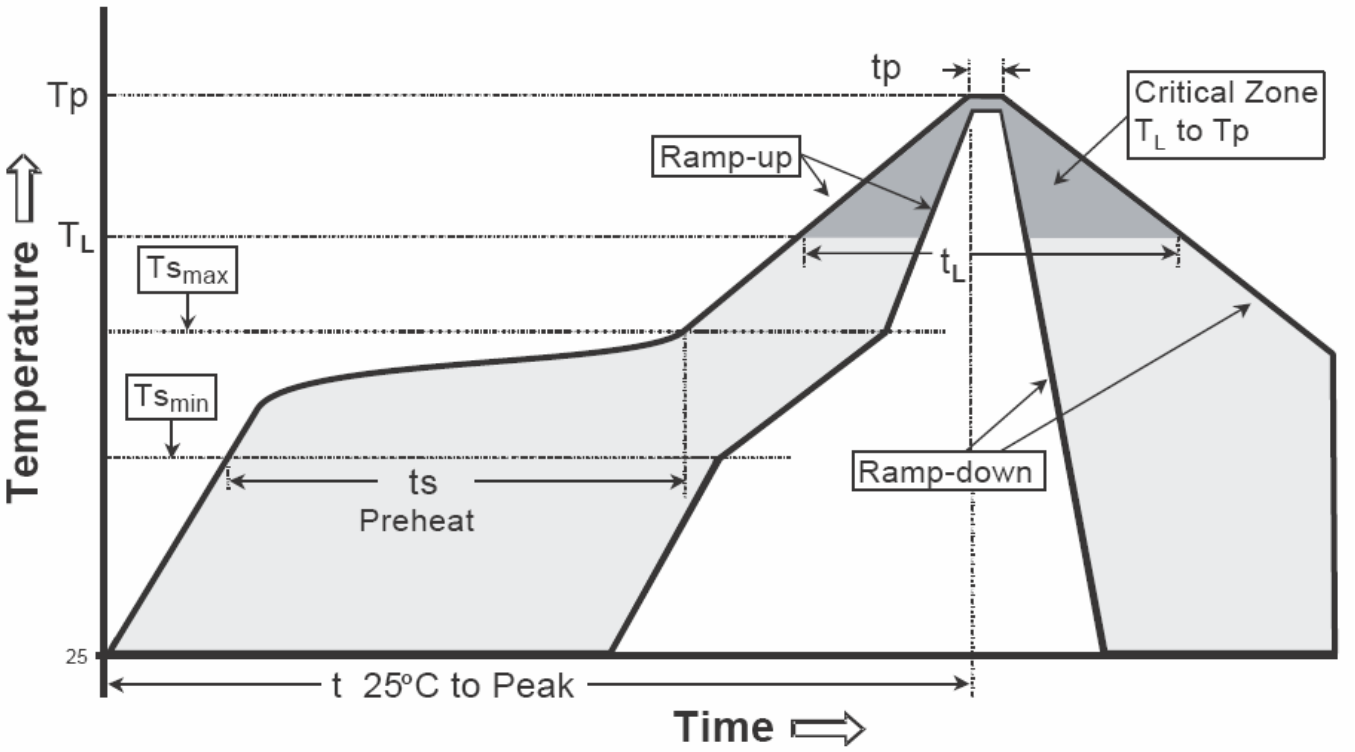
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

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

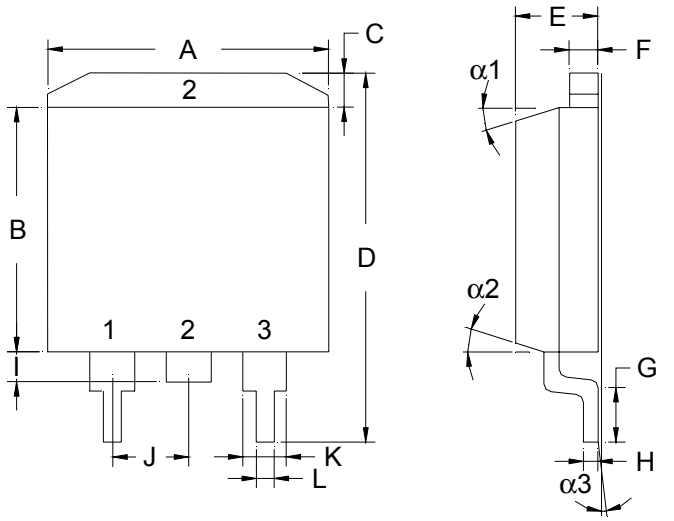
Recommended temperature profile for IR reflow



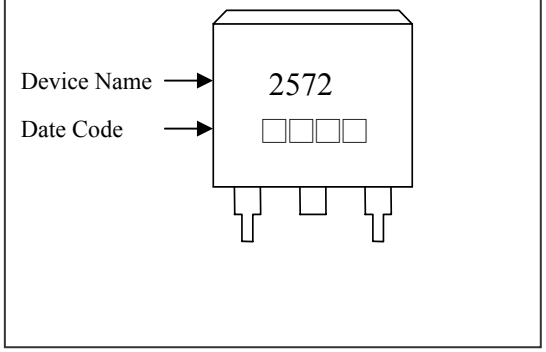
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (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-263 Dimension



Marking :



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

3-Lead Plastic Surface Mounted Package
CYStek Package Code : F3

*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.3800	0.4050	9.65	10.29	I	0.0500	0.0700	1.27	1.78
B	0.3300	0.3700	8.38	9.40	J	-	*0.1000	-	*2.54
C	-	0.0550	-	1.40	K	0.0450	0.0550	1.14	1.40
D	0.5750	0.6250	14.61	15.88	L	0.0200	0.0390	0.51	0.99
E	0.1600	0.1900	4.06	4.83	α1	-	-	6°	8°
F	0.0450	0.0550	1.14	1.40	α2	-	-	6°	8°
G	0.0900	0.1100	2.29	2.79	α3	-	-	0°	5°
H	0.0180	0.0290	0.46	0.74					

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.