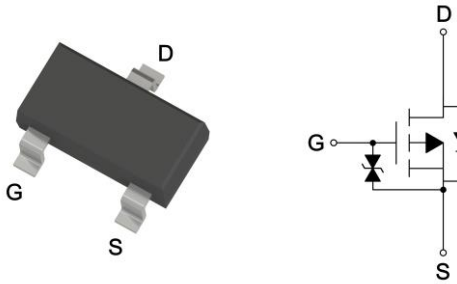


## Product Summary

$BV_{DSS}$	30	V
$R_{DS(ON)}$ typ. @ $V_{GS}=4.5V, I_D=1A$	128	mΩ
$R_{DS(ON)}$ typ. @ $V_{GS}=2.5V, I_D=1A$	158	
$I_D$ @ $V_{GS}=4.5V, T_A=25^\circ C$	1.2	A

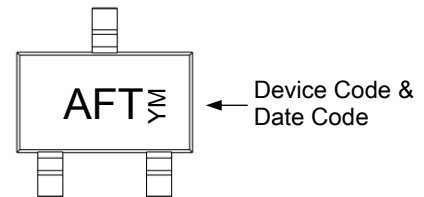
## SOT-323



## Features

- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free
- ESD protected gate, typical 1kV (HBM)

## Marking



YM: Date Code Marking

Y: Year Code, the last digit of Christian year

M: Month Code

1: Jan	2: Feb	3: Mar	4: Apr	5: May	6: Jun
7: Jul	8: Aug	9: Sep	A: Oct	B: Nov	C: Dec

## Ordering Information

Device	Package	Shipping
MTA140N03KS3-0-T1-G	SOT-323	3000pcs / Tape & Reel

0: Product rank, zero for no rank products.

T1: Packing spec, T1 : 3000pcs / tape & reel, 7" reel

G: Environment friendly grade: S for RoHS compliant products, G for RoHS compliant and green compound products.

## Absolute Maximum Ratings ( $T_A=25^\circ C$ )

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	$V_{DS}$	30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 10$		
Continuous Drain Current @ $V_{GS}=4.5V, T_A=25^\circ C$	$I_D$	1.2	A	
Continuous Drain Current @ $V_{GS}=4.5V, T_A=70^\circ C$		0.96		
Pulsed Drain Current	$I_{DM}$	4.8		
Continuous Body Diode Forward Current @ $T_A=25^\circ C$	$I_S$	0.4		
Pulsed Body Diode Forward Current @ $T_A=25^\circ C$	$I_{SM}$	1.6		
Total Power Dissipation	$P_D$	$T_A=25^\circ C$	0.5	W
		$T_A=70^\circ C$	0.3	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55~+150	$^\circ C$	
Steady State Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	270	$^\circ C/W$	



**Electrical Characteristics (T<sub>A</sub>=25°C, unless otherwise specified)**

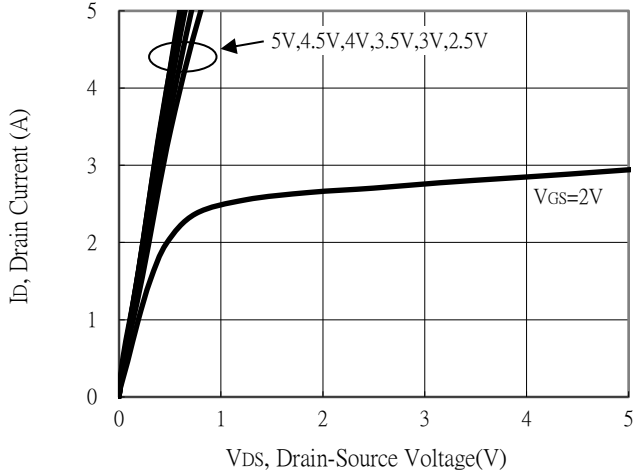
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
BV <sub>DSS</sub>	30	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
V <sub>GS(th)</sub>	0.5	-	1.5		V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
G <sub>FS</sub>	-	3.7	-	S	V <sub>DS</sub> =5V, I <sub>D</sub> =1A
I <sub>GSS</sub>	-	-	±10	μA	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V
I <sub>DSS</sub>	-	-	1		V <sub>DS</sub> =24V, V <sub>GS</sub> =0V
R <sub>DS(ON)</sub>	-	128	168	mΩ	V <sub>GS</sub> =4.5V, I <sub>D</sub> =1A
	-	158	225		V <sub>GS</sub> =2.5V, I <sub>D</sub> =1A
<b>Dynamic</b>					
C <sub>iSS</sub>	-	145	-	pF	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz
C <sub>oss</sub>	-	20	-		
C <sub>rSS</sub>	-	18	-		
R <sub>g</sub>	-	14	-	Ω	f=1MHz
Q <sub>g</sub> *d,e	-	2.1	-	nC	V <sub>DS</sub> =15V, I <sub>D</sub> =1A, V <sub>GS</sub> =4.5V
Q <sub>gs</sub> *d,e	-	0.7	-		
Q <sub>gd</sub> *d,e	-	0.1	-		
t <sub>d(ON)</sub> *d,e	-	5	-	ns	V <sub>DS</sub> =15V, I <sub>D</sub> =1A, V <sub>GS</sub> =4.5V, R <sub>GS</sub> =6Ω
tr *d,e	-	16	-		
t <sub>d(OFF)</sub> *d,e	-	16	-		
t <sub>f</sub> *d,e	-	6.5	-		
<b>Source-Drain Diode</b>					
V <sub>SD</sub> *d	-	0.83	1.2	V	I <sub>S</sub> =1A, V <sub>GS</sub> =0V
t <sub>rr</sub>	-	6	-	ns	I <sub>F</sub> =1A, di/dt=100A/μs
Q <sub>rr</sub>	-	2.3	-	nC	

**Note:**

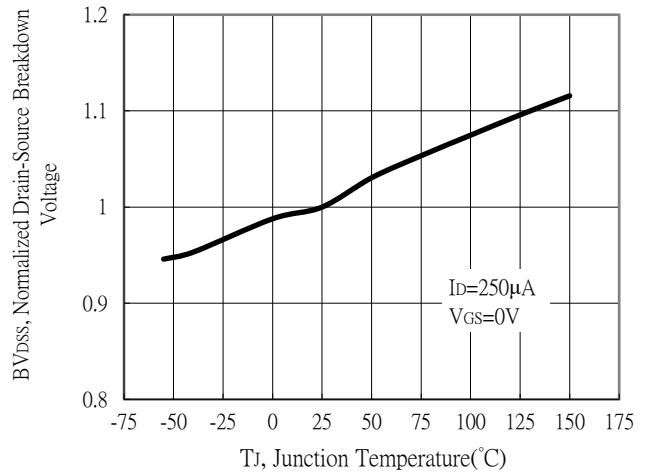
- \*a. The power dissipation P<sub>D</sub> is based on T<sub>J(MAX)</sub>=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper Dissipation.
- \*b. The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz copper, in a still air environment with T<sub>A</sub>=25°C. The power dissipation P<sub>D</sub> is based on R<sub>θJA</sub> and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
- \*c. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C. Ratings are based on low frequency and low duty cycles to keep initial T<sub>J</sub>=25°C.
- \*d. Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.
- \*e. Independent of operating temperature.

## Typical Characteristics

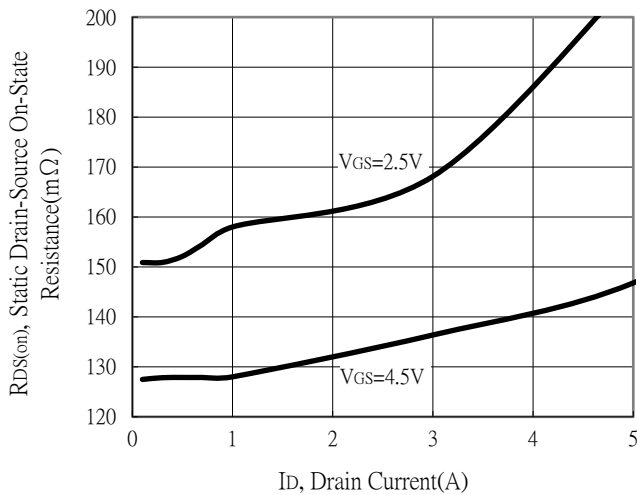
Typical Output Characteristics



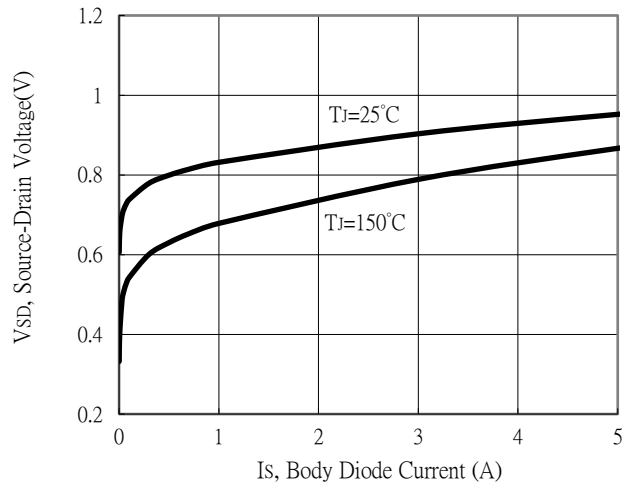
Breakdown Voltage vs Ambient Temperature



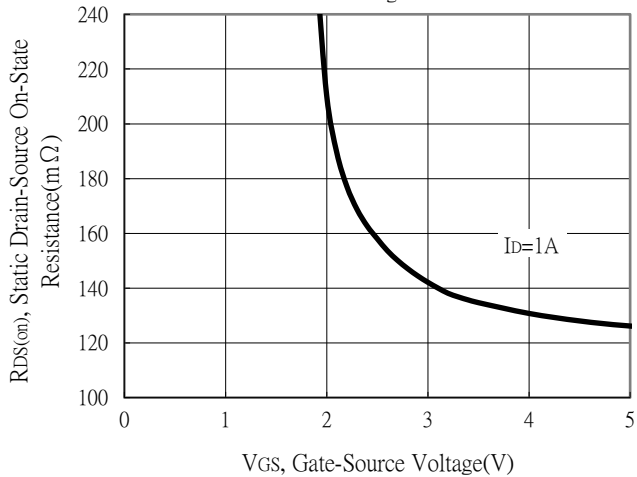
Static Drain-Source On-State resistance vs Drain Current



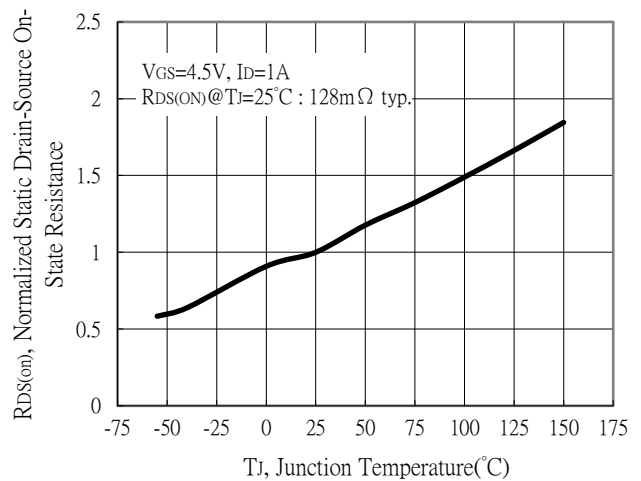
Body Diode Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

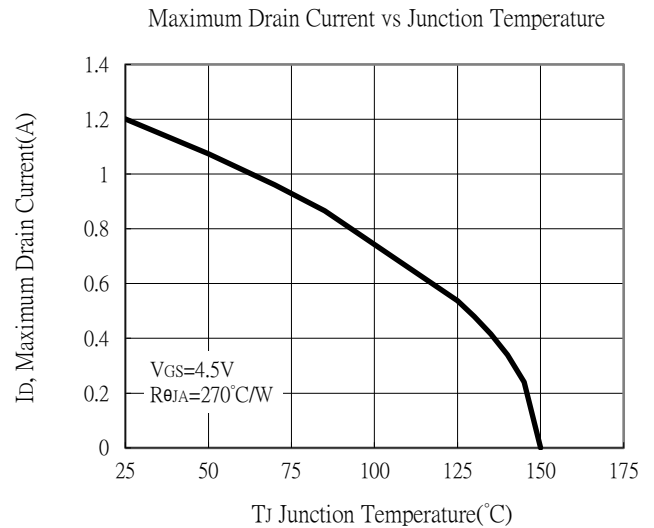
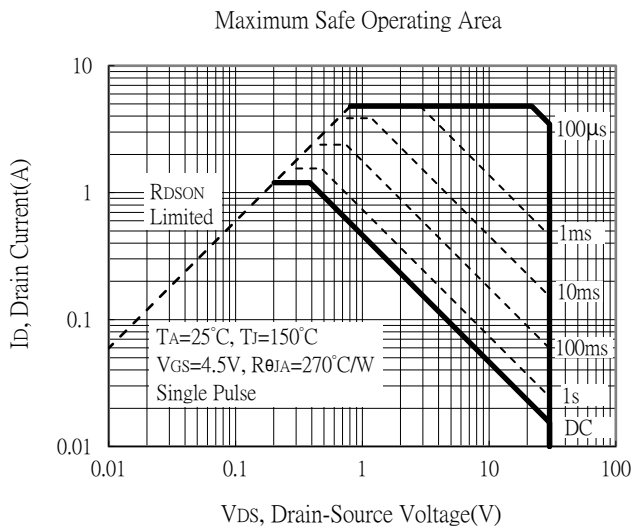
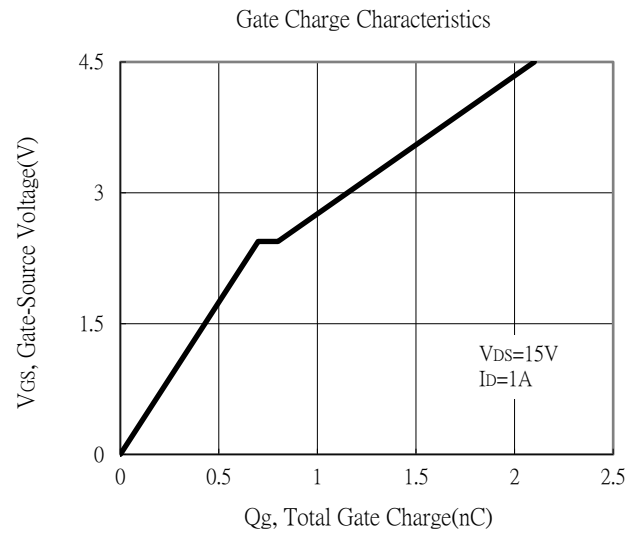
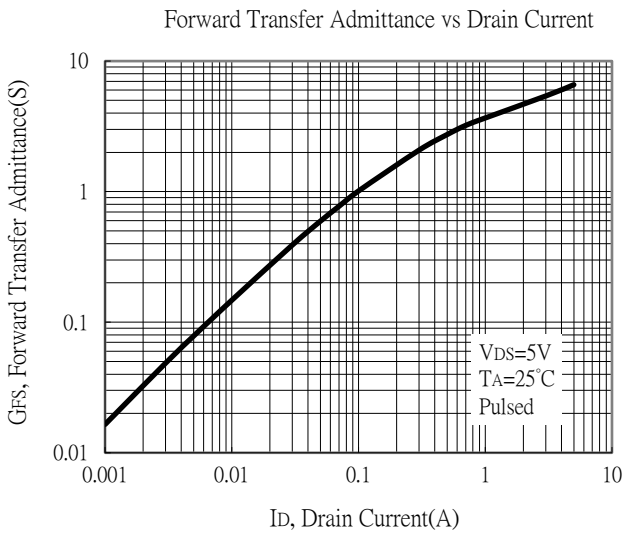
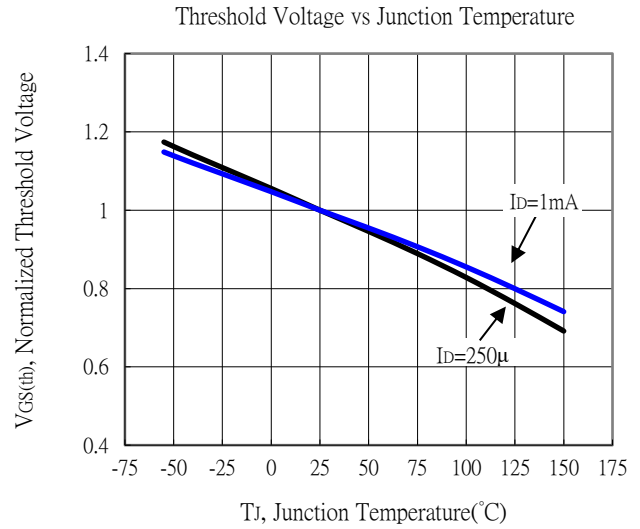
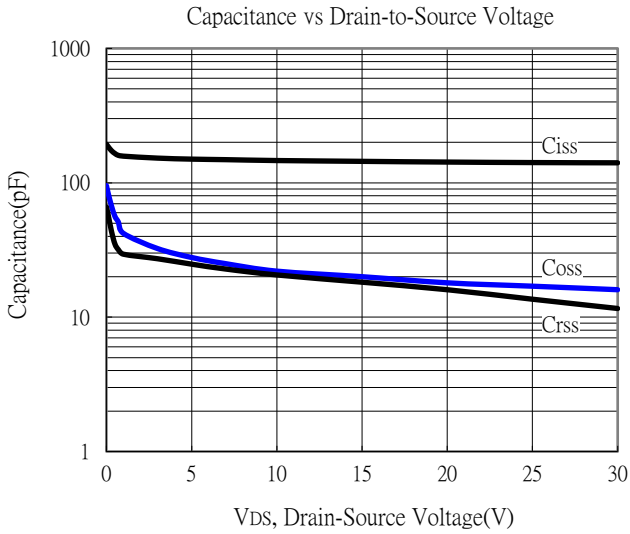


Drain-Source On-State Resistance vs Junction Temperature



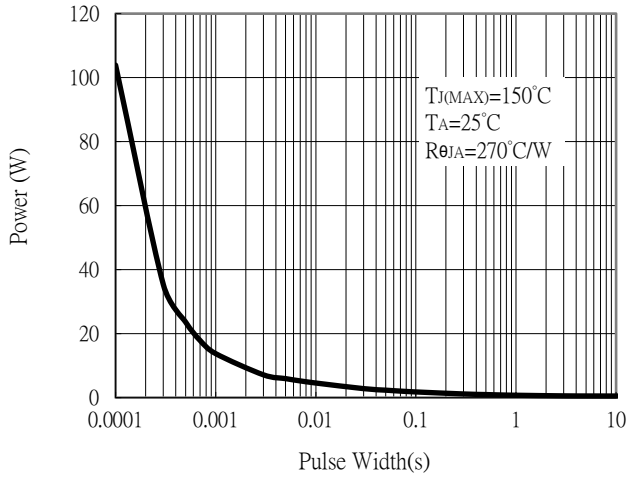


## Typical Characteristics

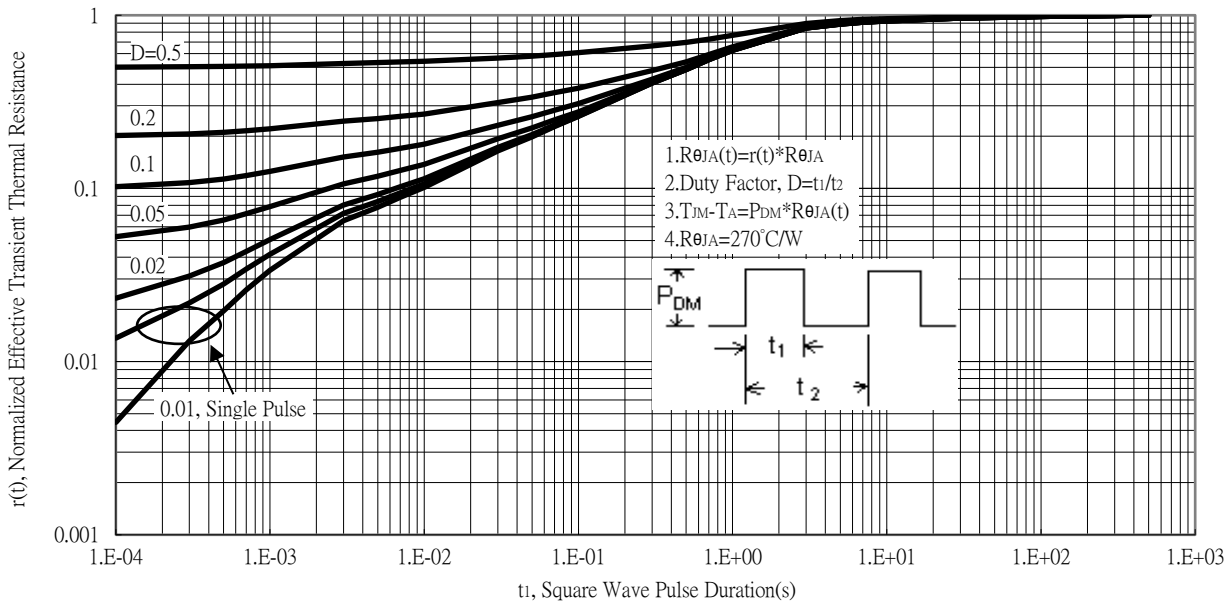


## Typical Characteristics

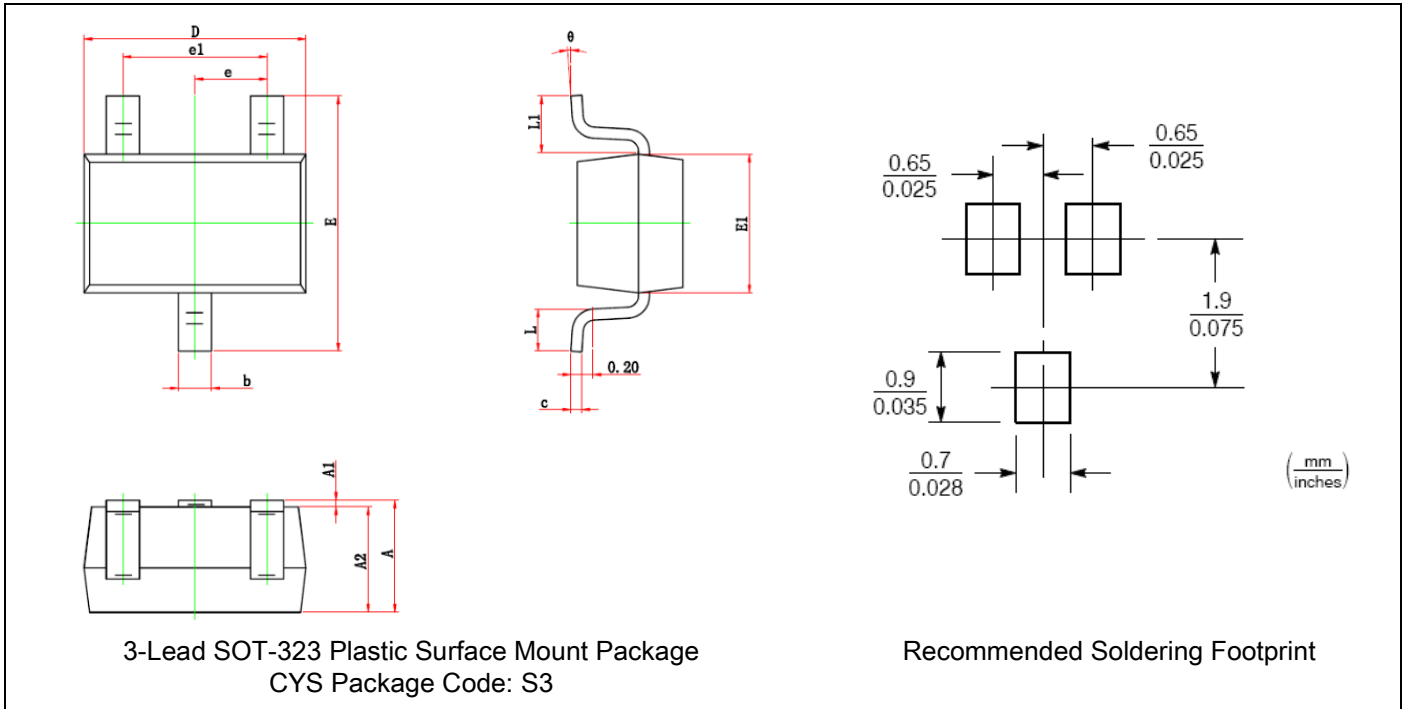
Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves



## SOT-323 Dimension



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.035	0.043	0.900	1.100	E1	0.045	0.053	1.150	1.350
A1	0.000	0.004	0.000	0.100	e	0.026	TYP.	0.650	TYP.
A2	0.035	0.039	0.900	1.000	e1	0.047	0.055	1.200	1.400
b	0.008	0.016	0.200	0.400	L	0.010	0.018	0.260	0.460
c	0.003	0.006	0.080	0.150	L1	0.021	REF.	0.525	REF.
D	0.079	0.087	2.000	2.200	θ	0°	8°	0°	8°
E	0.085	0.096	2.150	2.450					

**Note:**

- 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.

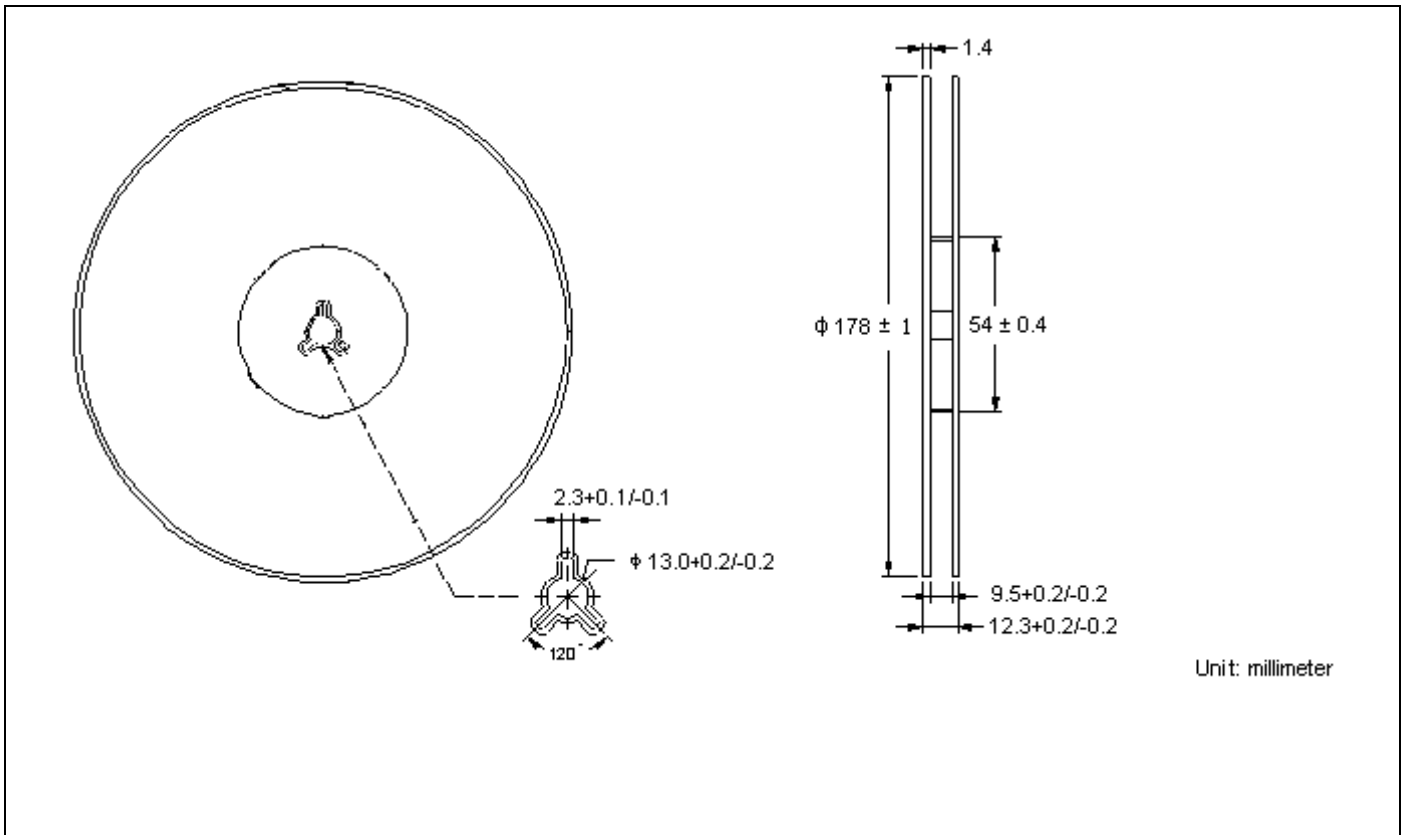
**Material:**

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

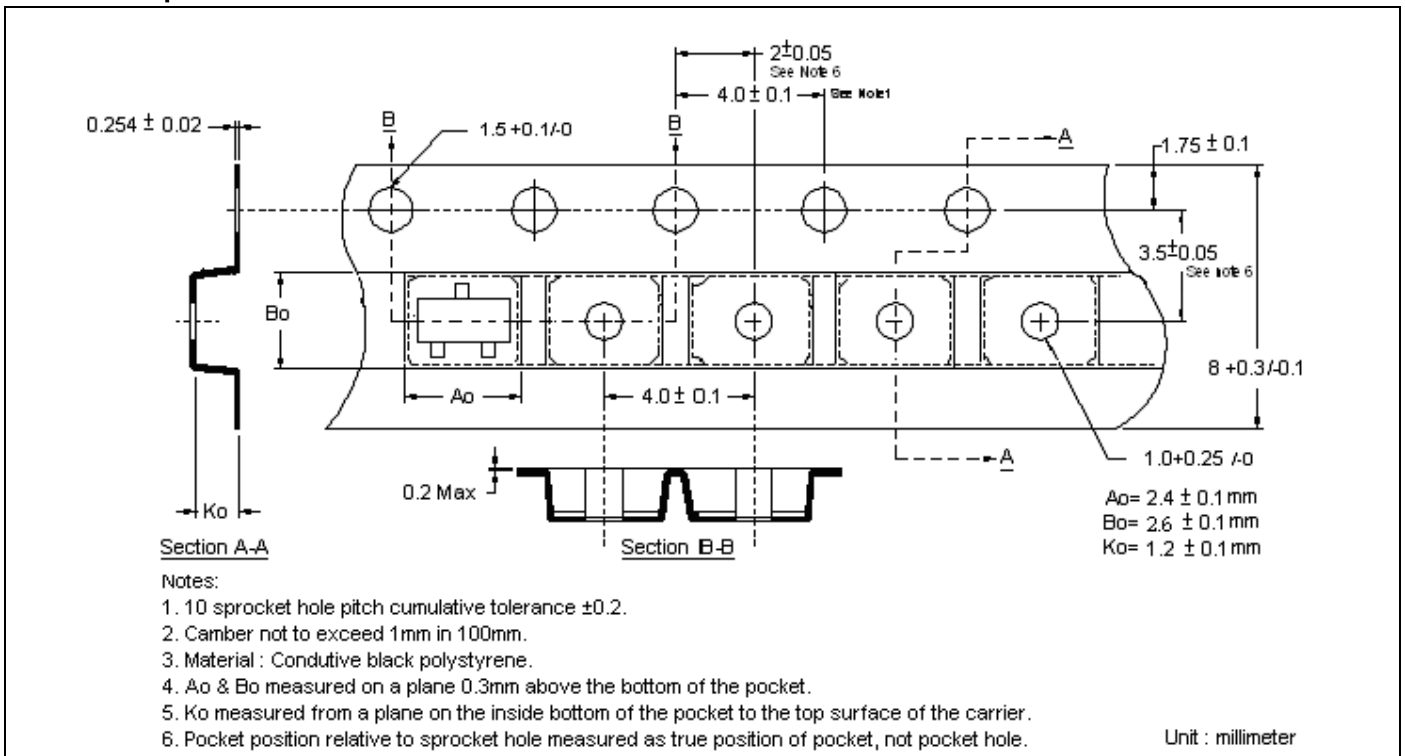
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## Reel Dimension



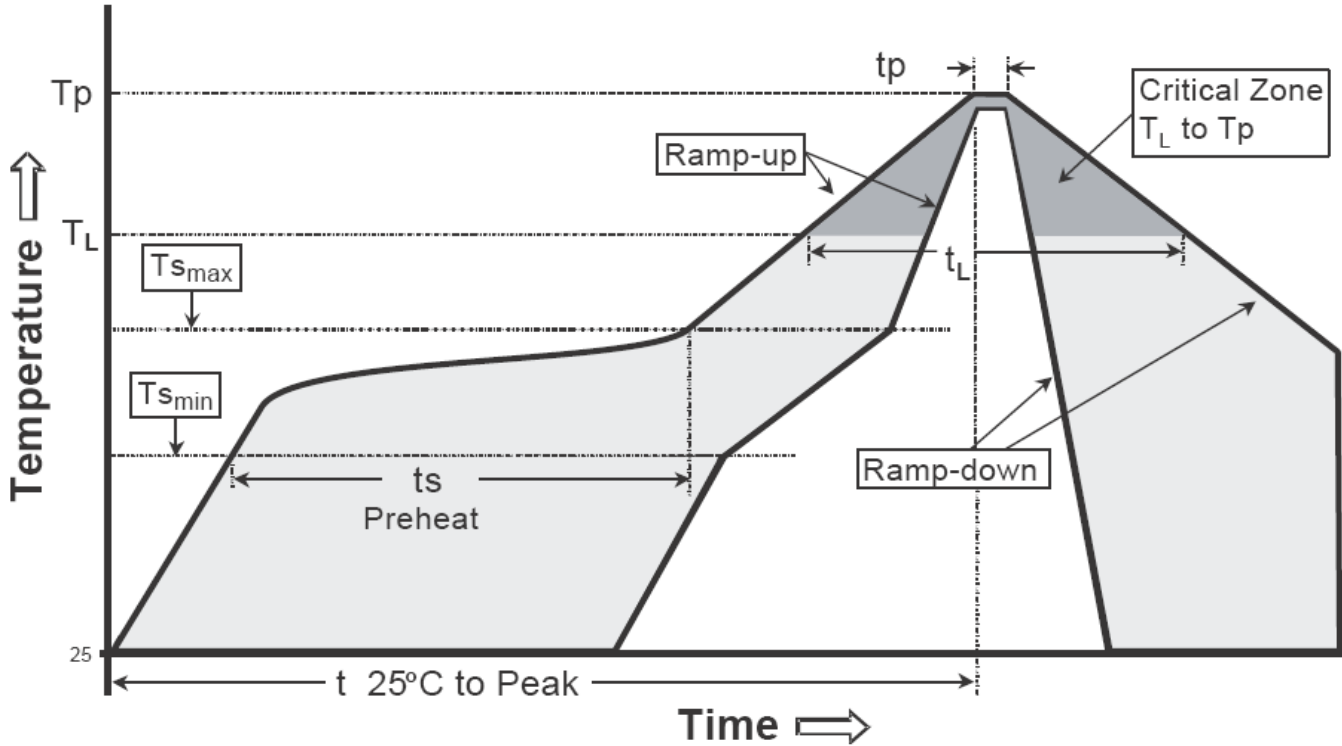
## Carrier Tape Dimension



### 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 <sub>S</sub> max to T <sub>P</sub> )	3°C/second max.	3°C/second max.
Preheat -Temperature Min (T <sub>S</sub> min) -Temperature Max (T <sub>S</sub> max) -Time (t <sub>s</sub> min to t <sub>s</sub> max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (T <sub>L</sub> ) -Time (t <sub>L</sub> )	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature (T <sub>P</sub> )	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature (t <sub>p</sub> )	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.