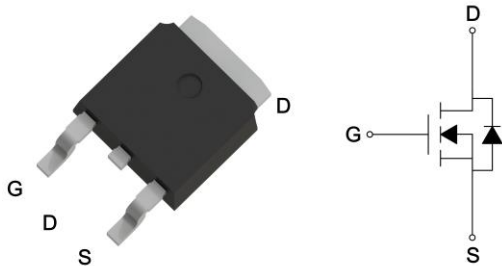


Product Summary

BV_{DSS}	30	V
$R_{DS(ON)}$ typ. @ $V_{GS}=10V, I_D=20A$	1.8	mΩ
$R_{DS(ON)}$ typ. @ $V_{GS}=4.5V, I_D=20A$	2.4	
I_D @ $V_{GS}=10V, T_C=25^\circ C$	56	A
I_D @ $V_{GS}=10V, T_A=25^\circ C$	27	

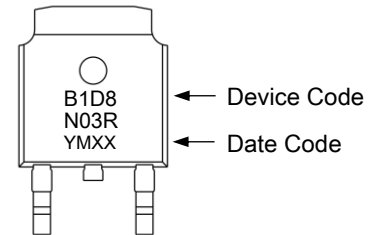
TO-252



Features

- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free

Marking



YMXX: Date Code Marking

Y: Year Code, the last digit of Christian year

M: Month Code

A: Jan	B: Feb	C: Mar	D: Apr	E: May	F: Jun
G: Jul	H: Aug	J: Sep	K: Oct	L: Nov	M: Dec

XX: Production Serial Number, 01~99

Ordering Information

Device	Package	Shipping
MTB1D8N03RJ3-0-T3-G	TO-252	2500pcs / Tape & Reel

0: Product rank, zero for no rank products.

T3: Packing spec, T3 : 2500pcs / tape & reel, 13" 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}	± 20		
Continuous Drain Current @ $V_{GS}=10V, T_C=25^\circ C$ (silicon limit)	I_D	125	A	
Continuous Drain Current @ $V_{GS}=10V, T_C=25^\circ C$ (package limit)		56		
Continuous Drain Current @ $V_{GS}=10V, T_C=100^\circ C$		56		
Continuous Drain Current @ $V_{GS}=10V, T_A=25^\circ C$		27		
Continuous Drain Current @ $V_{GS}=10V, T_A=70^\circ C$		22		
Pulsed Drain Current		I_{DM}		224
Continuous Body Diode Forward Current @ $T_C=25^\circ C$	I_S	56	A	
Pulsed Body Diode Forward Current @ $T_C=25^\circ C$	I_{SM}	224		
Avalanche Current @ $L=0.1mH$	I_{AS}	45	mJ	
Avalanche Energy @ $L=0.5mH$	E_{AS}	189		
Total Power Dissipation	P_D	$T_C=25^\circ C$	74	W
		$T_C=100^\circ C$	30	
		$T_A=25^\circ C$	3.6	
		$T_A=70^\circ C$	2.3	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ C$	
Steady State Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.7	$^\circ C/W$	
Steady State Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	35		



Electrical Characteristics (T_A=25°C, unless otherwise specified)

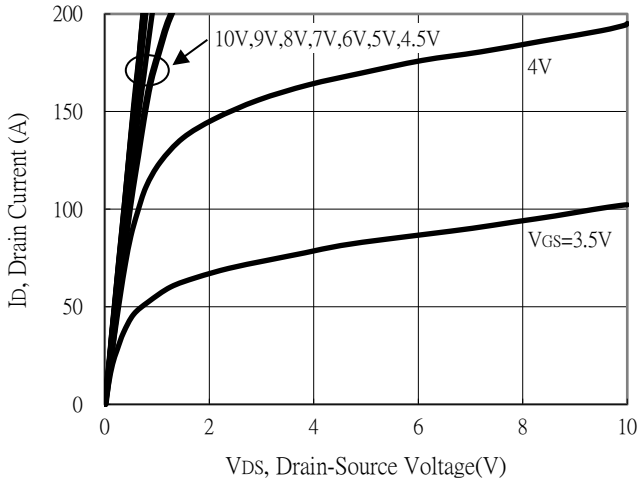
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	30	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	1	-	2.5		V _{DS} =V _{GS} , I _D =250μA
G _{FS}	-	52	-	S	V _{DS} =5V, I _D =20A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =24V, V _{GS} =0V
R _{DS(ON)}	-	1.8	2.4	mΩ	V _{GS} =10V, I _D =20A
	-	2.4	3.3		V _{GS} =4.5V, I _D =20A
Dynamic					
C _{iss}	-	3350	-	pF	V _{DS} =15V, V _{GS} =0V, f=1MHz
C _{oss}	-	2400	-		
C _{rss}	-	150	-		
R _g	-	1.4	-	Ω	f=1MHz
Q _g *d,e	-	28	-	nC	V _{DS} =15V, I _D =20A, V _{GS} =4.5V
Q _g *d,e	-	56	-		
Q _{gs} *d,e	-	11	-		
Q _{gd} *d,e	-	10	-		
t _{d(ON)} *d,e	-	22	-	ns	V _{DS} =15V, I _D =20A, V _{GS} =10V, R _{GS} =6Ω
t _r *d,e	-	19	-		
t _{d(OFF)} *d,e	-	75	-		
t _f *d,e	-	19	-		
Source-Drain Diode					
V _{SD} *d	-	0.84	1.2	V	I _S =20A, V _{GS} =0V
t _{rr}	-	47	-	ns	I _F =20A, di/dt=100A/μs
Q _{rr}	-	40	-	nC	

Note:

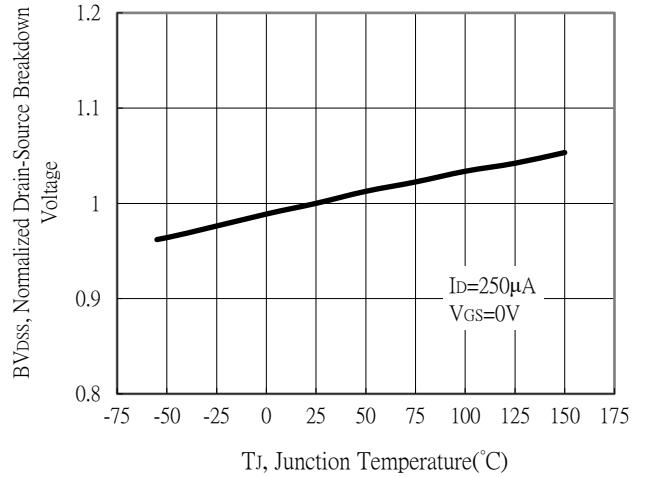
- *a. The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper Dissipation.
- *b. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on R_{θJA} 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_{J(MAX)}=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.
- *d. Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.
- *e. Independent of operating temperature.

Typical Characteristics

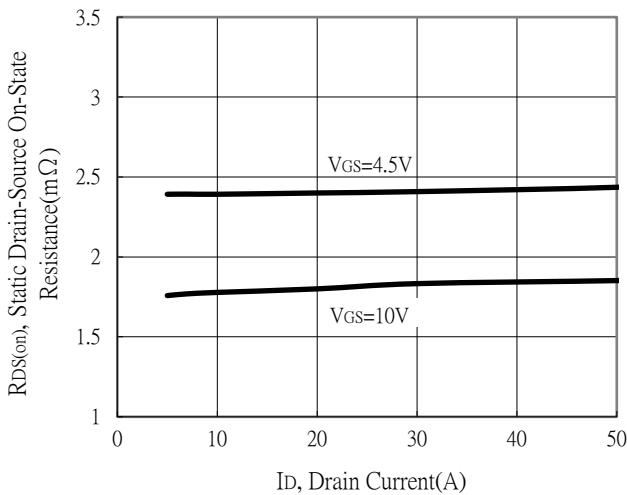
Typical Output Characteristics



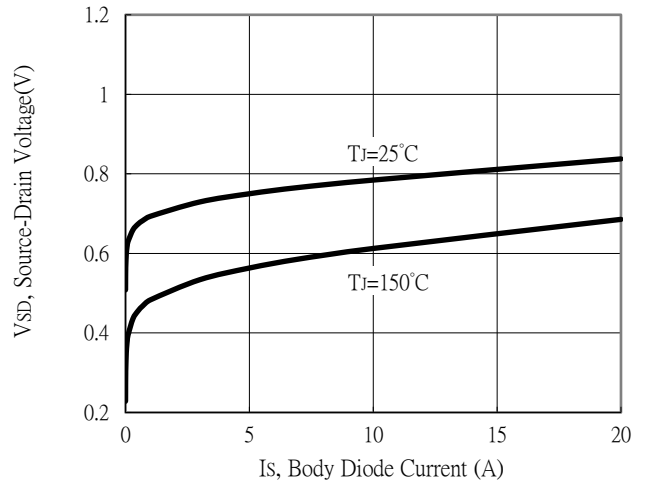
Breakdown Voltage vs Ambient Temperature



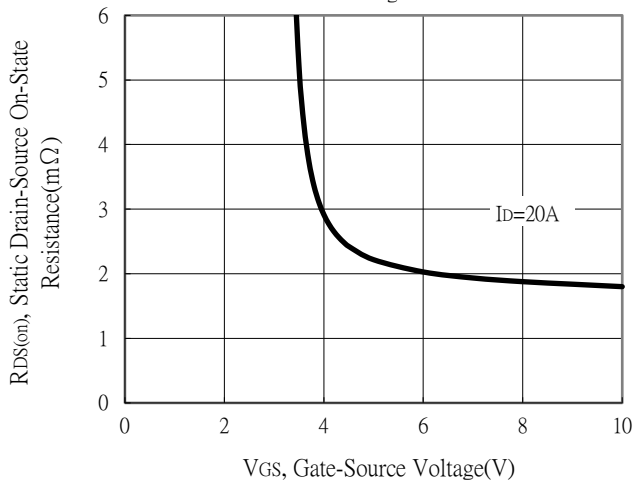
Static Drain-Source On-State resistance vs Drain Current



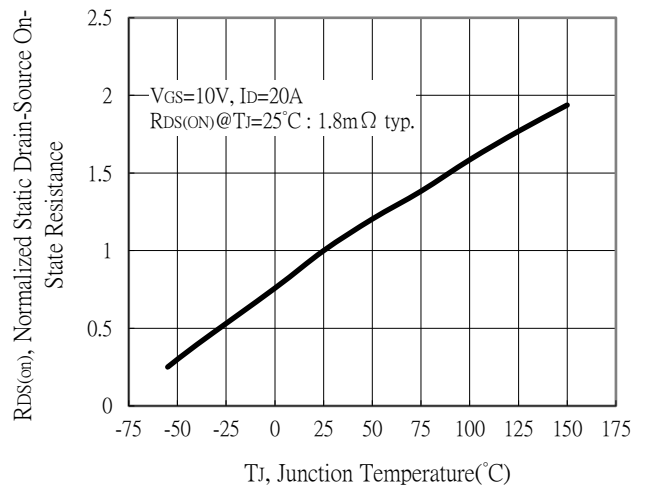
Body Diode Current vs Source-Drain Voltage



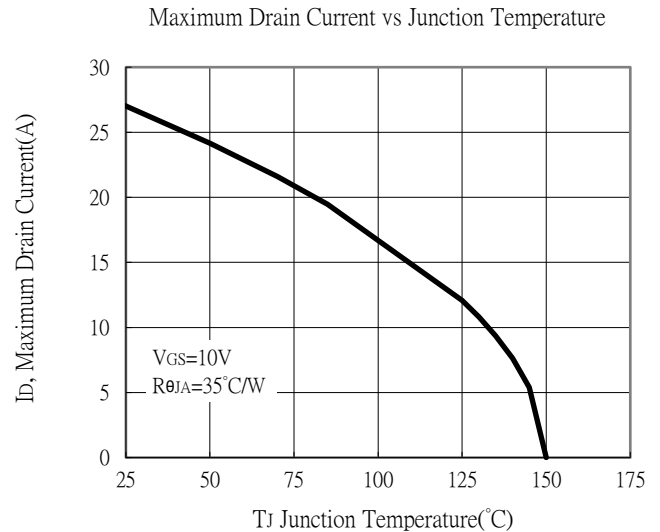
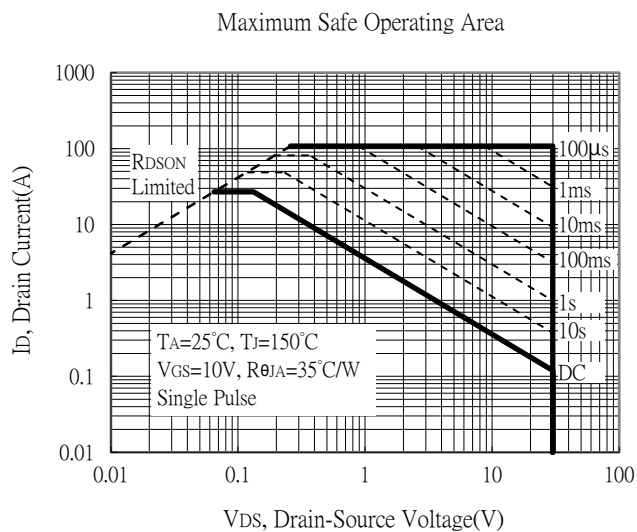
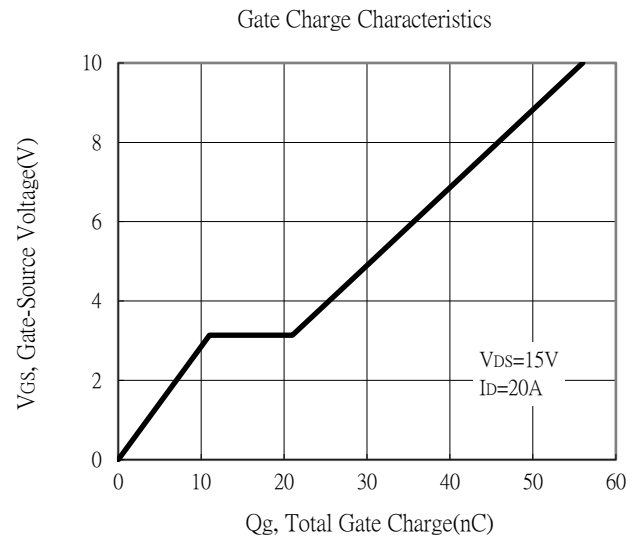
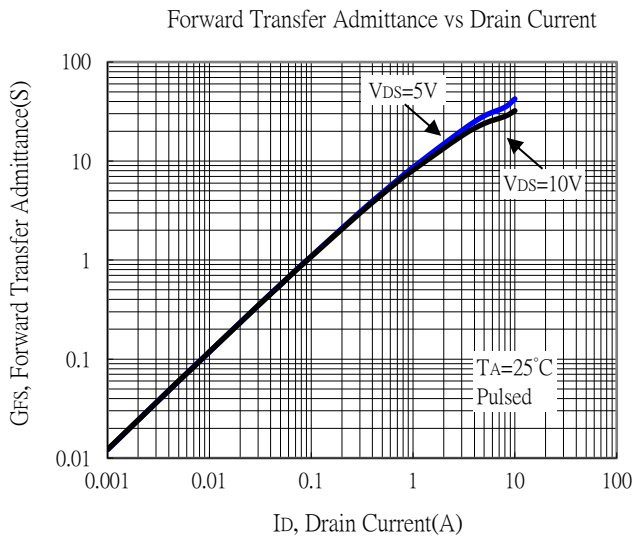
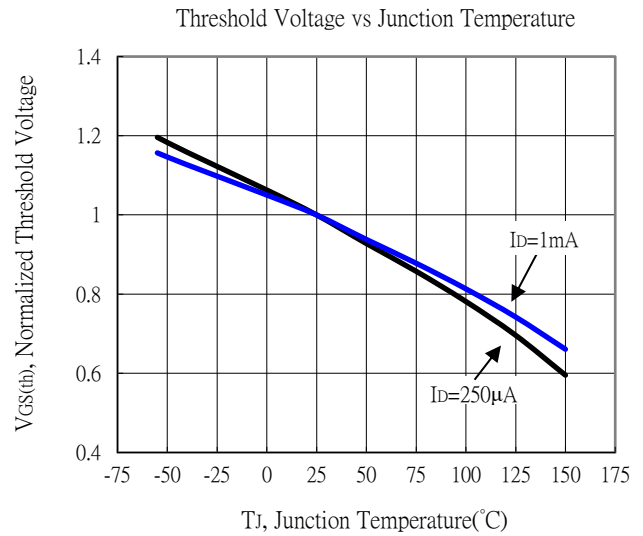
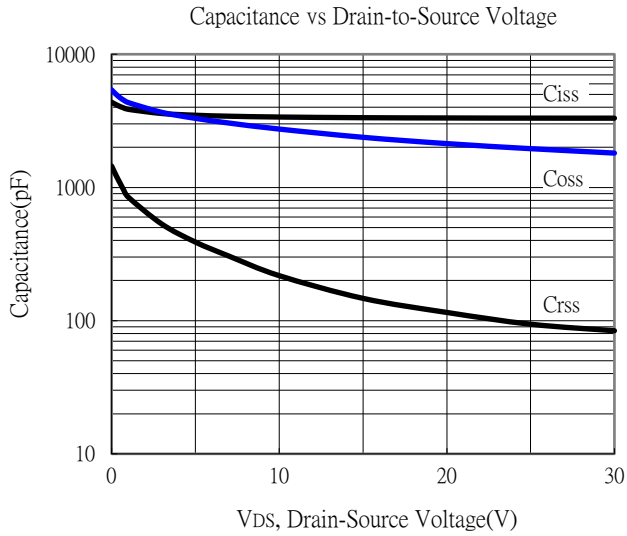
Static Drain-Source On-State Resistance vs Gate-Source Voltage



Drain-Source On-State Resistance vs Junction Temperature



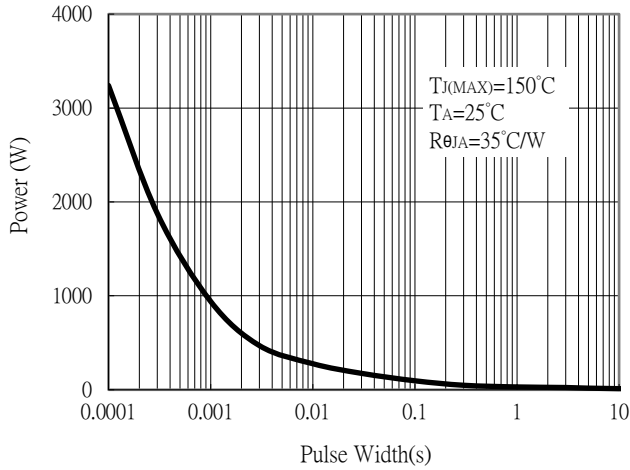
Typical Characteristics



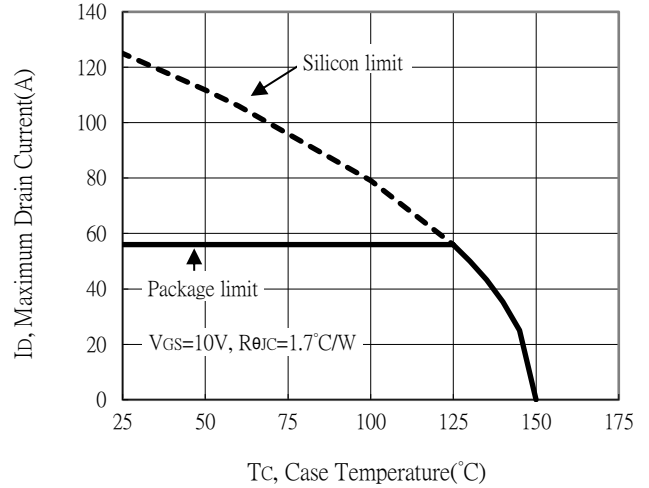


Typical Characteristics

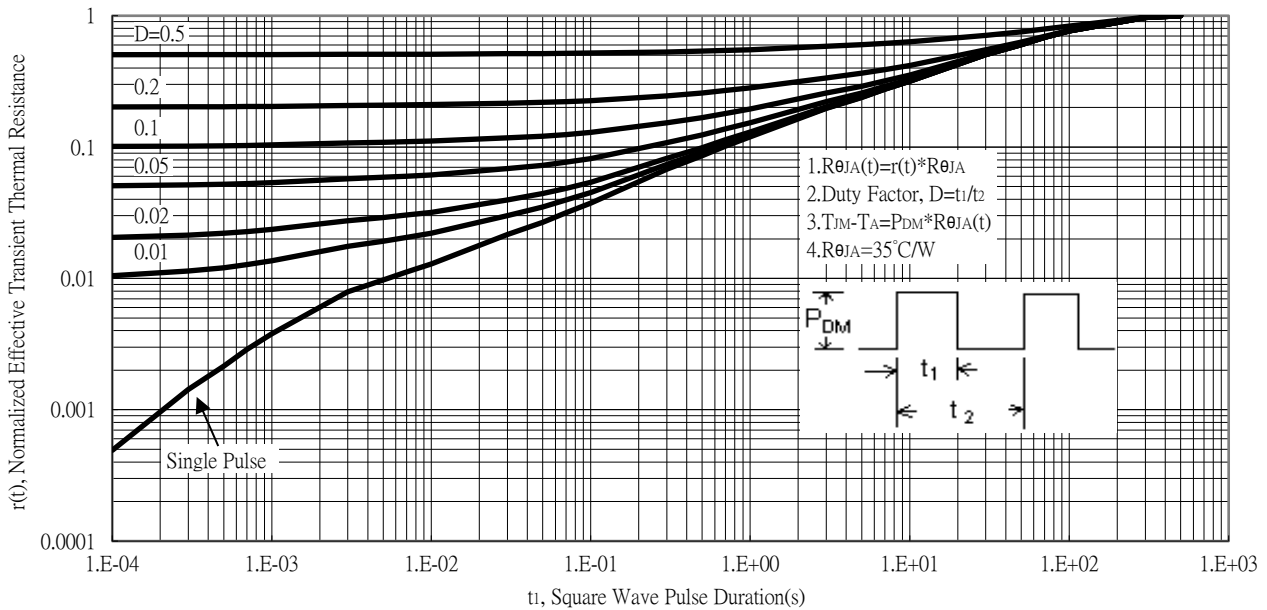
Single Pulse Power Rating, Junction to Ambient



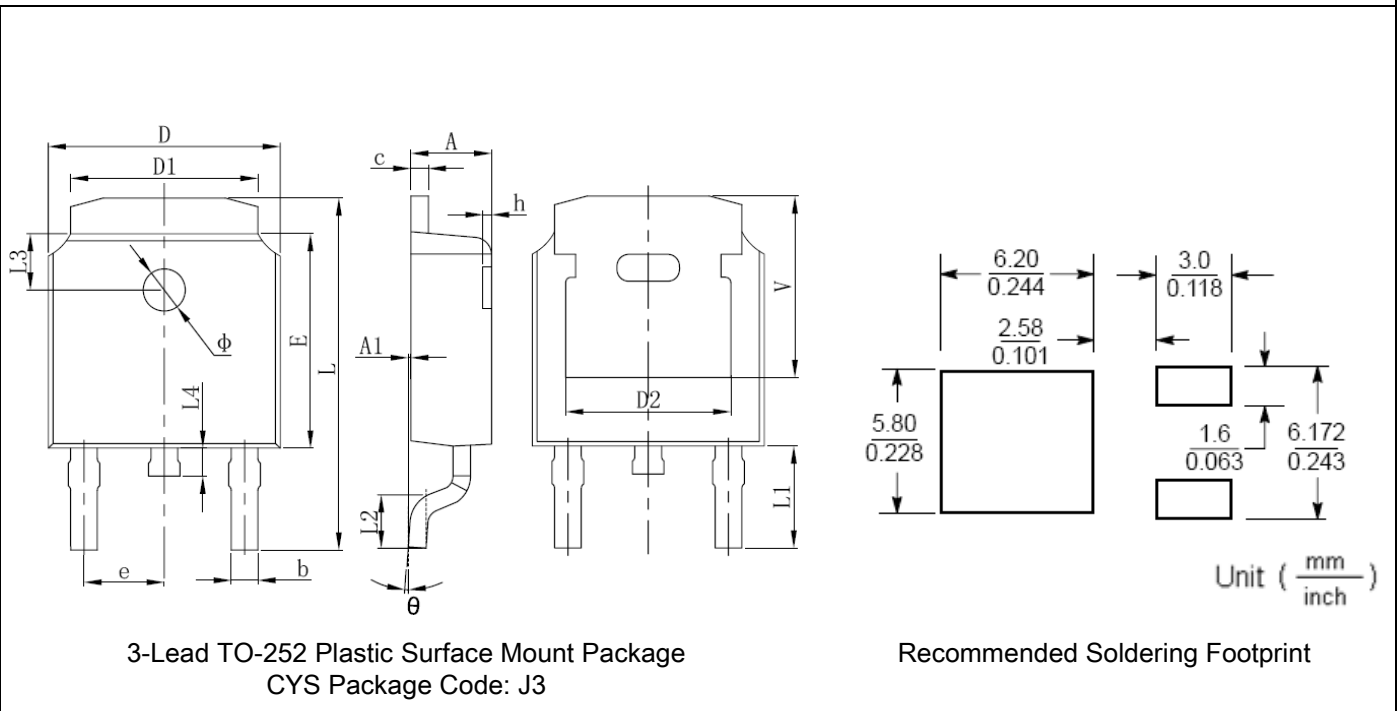
Maximum Drain Current vs Case Temperature



Transient Thermal Response Curves



TO-252 Dimension



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.087	0.094	2.200	2.400	L	0.382	0.406	9.712	10.312
A1	0.000	0.005	0.000	0.127	L1	0.114	REF	2.900	REF
b	0.025	0.030	0.635	0.770	L2	0.055	0.067	1.400	1.700
c	0.018	0.023	0.460	0.580	L3	0.63	REF	1.600	REF
D	0.256	0.264	6.500	6.700	L4	0.024	0.039	0.600	1.000
D1	0.201	0.215	5.100	5.460	Φ	0.043	0.051	1.100	1.300
D2	0.190	REF	4.830	REF	θ	0°	8°	0°	8°
E	0.236	0.244	6.000	6.200	h	0.000	0.012	0.000	0.300
e	0.086	0.094	2.186	2.386	V	0.207	REF	5.250	REF

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.

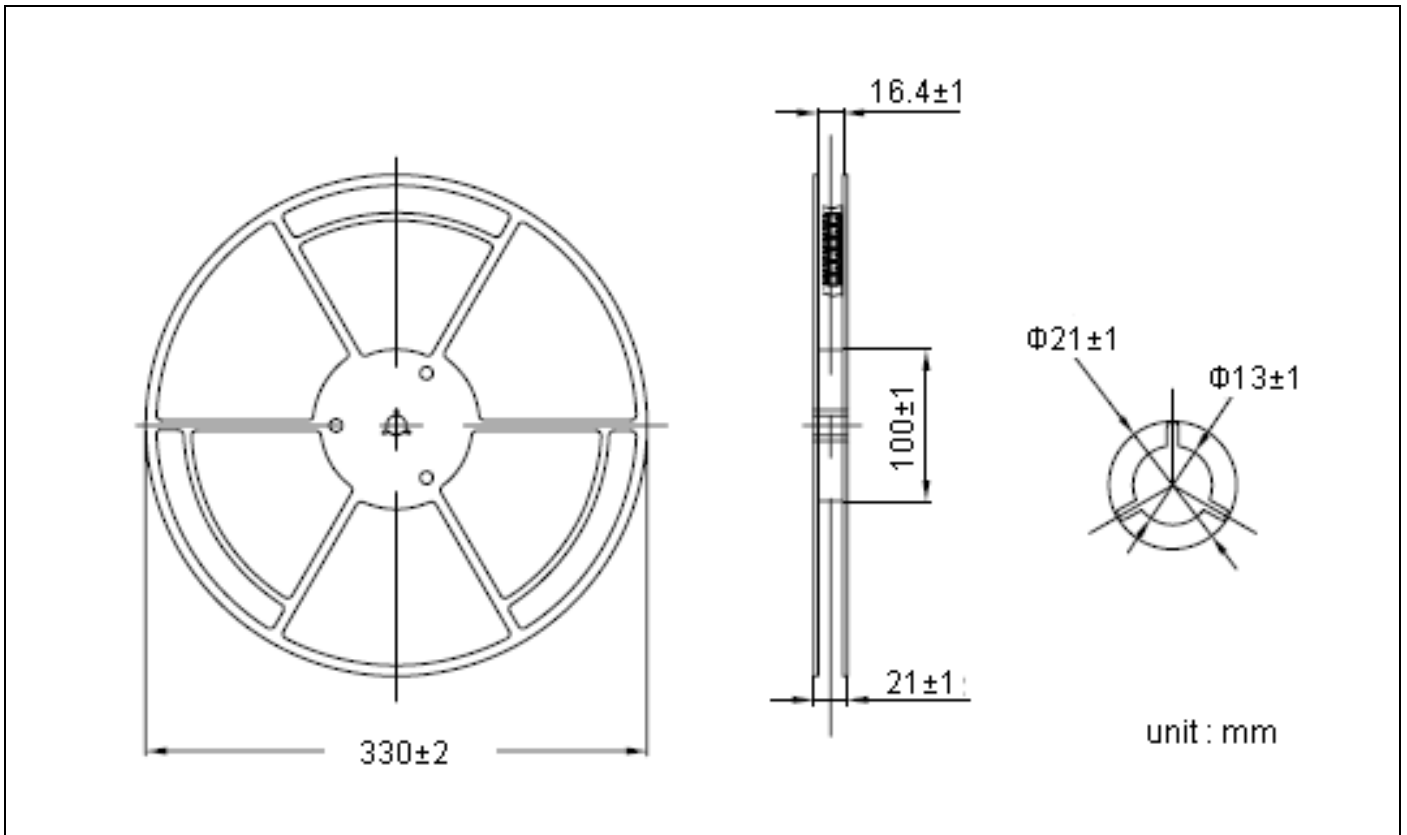
Material:

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

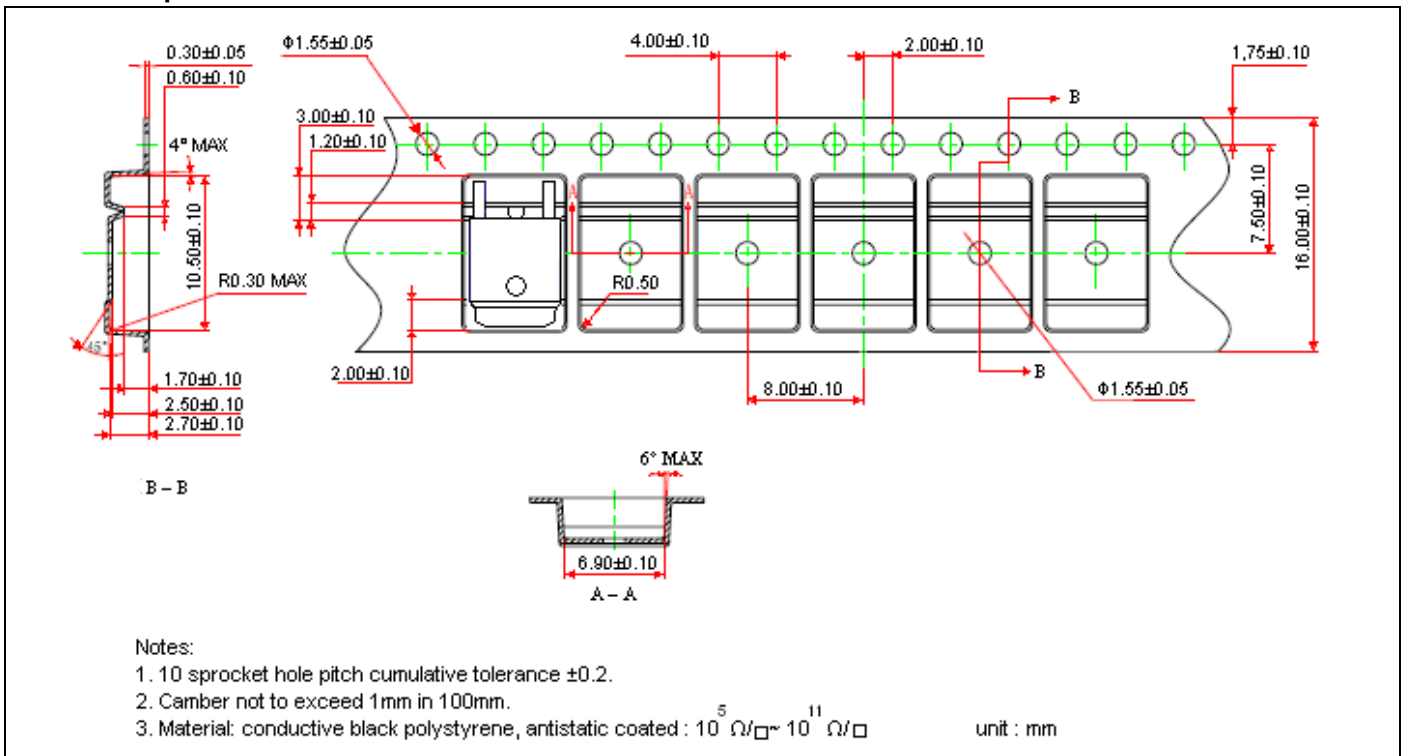
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Reel Dimension



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 _S max to T _P)	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 (t _P)	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.