

N-CHANNEL MOSFET

MTN2328M3

BV_{DSS}	100V
I_D	3A
R_{DS(on)}@V_{GS}=10V, I_D=3A	130mΩ (typ)
R_{DS(on)}@V_{GS}=4.5V, I_D=3A	136mΩ (typ)

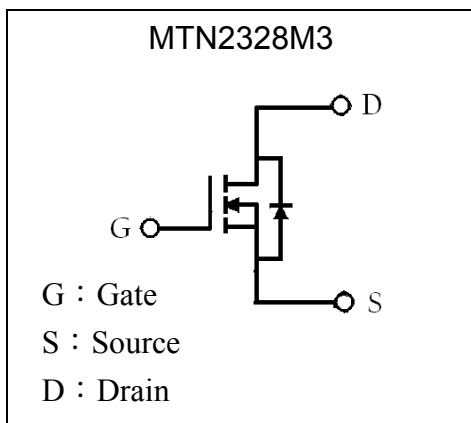
Description

The MTN2328M3 is a N-channel enhancement-mode MOSFET.

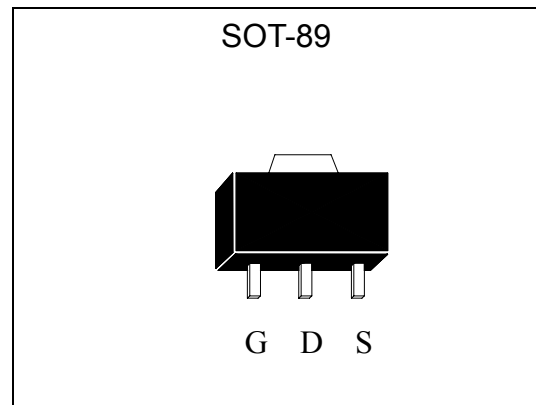
Features

- Low on-resistance
- High speed switching
- Low-voltage drive
- Easily designed drive circuits
- Pb-free lead plating package

Symbol



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DSS}	100	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current @V _{GS} =10V, T _A =25°C	I _D	3	A
Continuous Drain Current @V _{GS} =10V, T _A =100°C	I _D	1.9	A
Pulsed Drain Current	I _{DM}	12 *1	A
Total Power Dissipation	P _D	2.1 *2	W
Operating Junction and Storage Temperature Range	T _j ; T _{stg}	-55~+150	°C

Note : *1. Pulse Width ≤ 300μs, Duty cycle ≤ 2%

*2. When the device is surface mounted on 1 in² copper pad of FR-4 board with 2 oz. copper.



Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient	$R_{th,ja}$	60	°C/W

Note : Surface mounted on 1 in² copper pad of FR-4 board.

Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS} *	100	-	-	V	V _{GS} =0, I _D =10μA
V _{GS(th)}	1	1.8	2.5	V	V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0
I _{DSS}	-	-	1	μA	V _{DS} =100V, V _{GS} =0
R _{DS(ON)} *	-	130	150	mΩ	I _D =3A, V _{GS} =10V
	-	136	160		I _D =3A, V _{GS} =4.5V
G _{FS}	-	5	-	S	V _{DS} =10V, I _D =3A
Dynamic					
C _{iss}	-	1188	-	pF	V _{DS} =25V, V _{GS} =0, f=1MHz
C _{oss}	-	30	-		
C _{rss}	-	17	-		
td(ON)	-	7	-	ns	V _{DS} =50V, I _D =3A, V _{GS} =10V, R _{GEN} =6Ω
tr	-	3.2	-		
td(OFF)	-	29	-		
tf	-	5	-		
Qg	-	18.4	-	nC	V _{DS} =50V, I _D =3A, V _{GS} =10V
Qgs	-	4	-		
Qgd	-	7.5	-		
Source-Drain Diode					
*I _S	-	-	3	A	
*I _{SM}	-	-	12		
*V _{SD}	-	-	1.2	V	V _{GS} =0V, I _S =3A
*trr	-	45	-	ns	I _F =3A, dI _F /dt=100A/μs
*Qrr	-	70	-	nC	

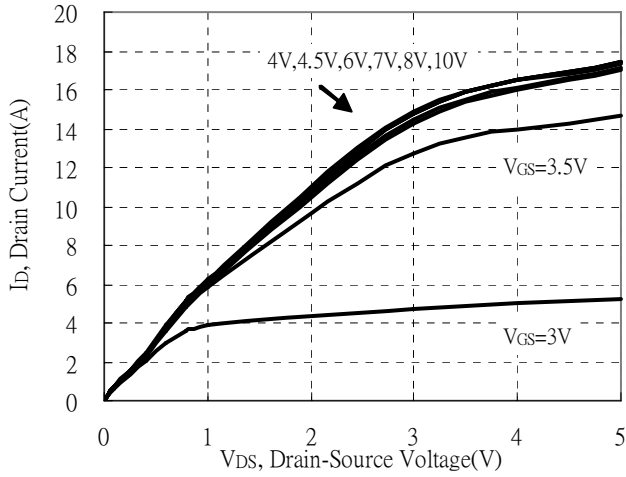
*Pulse Test : Pulse Width ≤380μs, Duty Cycle≤2%

Ordering Information

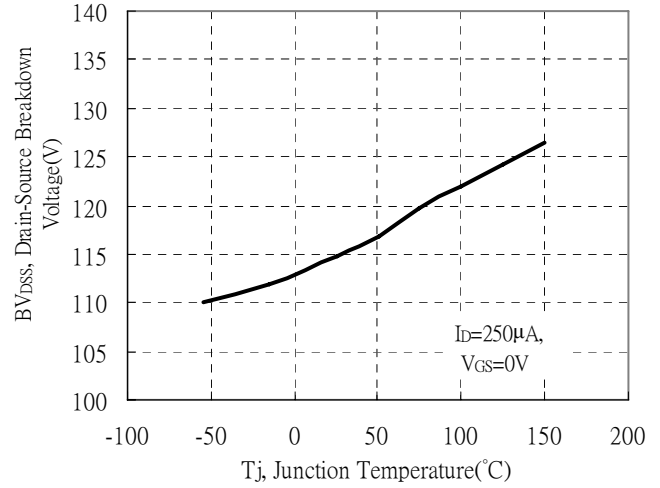
Device	Package	Shipping	Marking
MTN2328M3	SOT-89 (Pb-free lead plating package)	1000 pcs / Tape & Reel	2328

Typical Characteristics

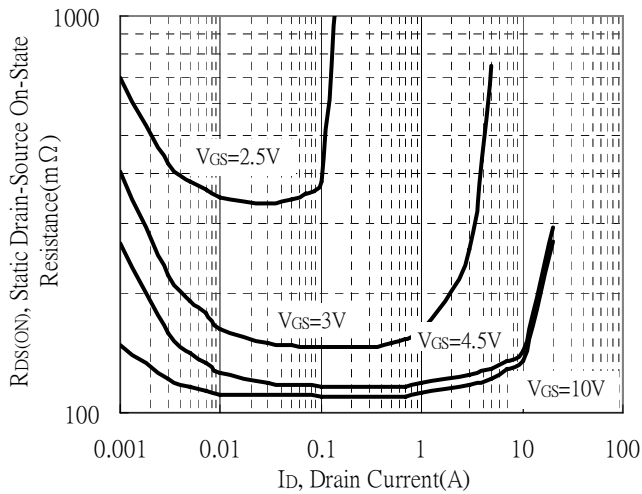
Typical Output Characteristics



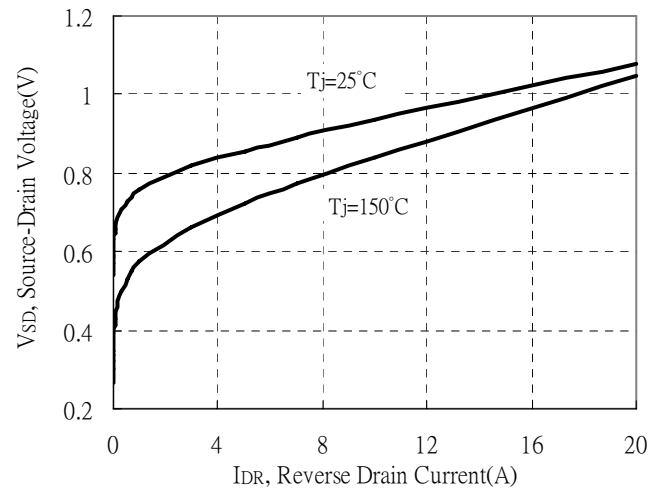
Breakdown Voltage vs Ambient Temperature



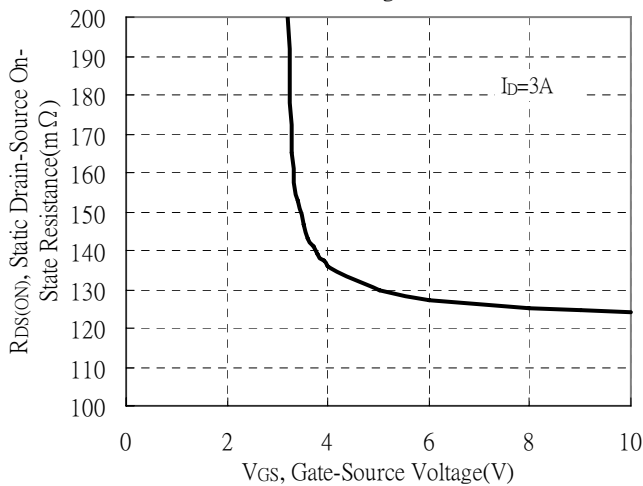
Static Drain-Source On-State resistance vs Drain Current



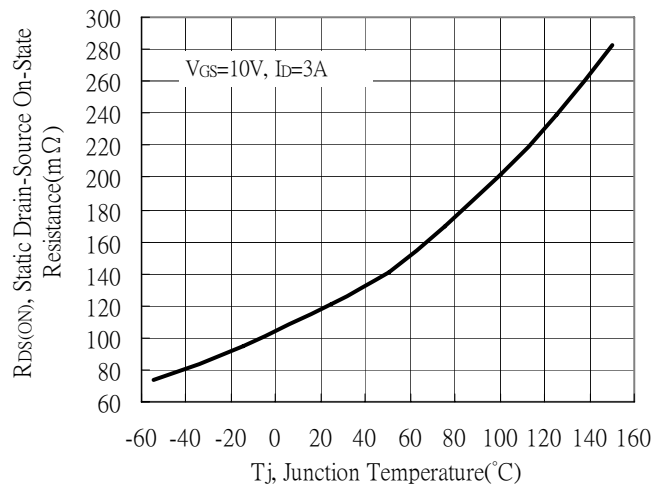
Reverse Drain Current vs Source-Drain Voltage



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

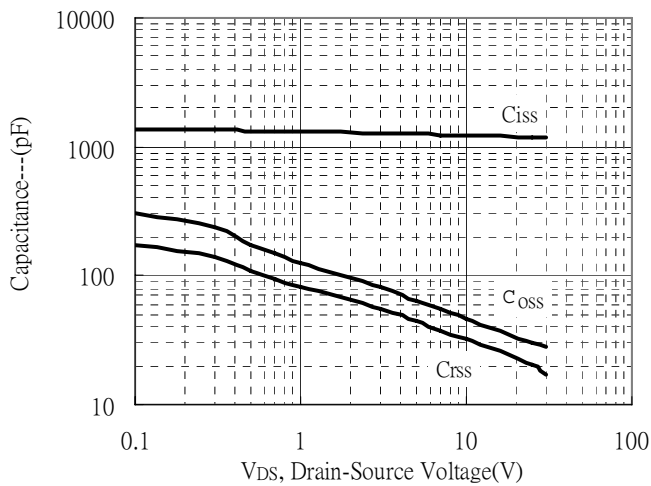


Drain-Source On-State Resistance vs Junction Temperature

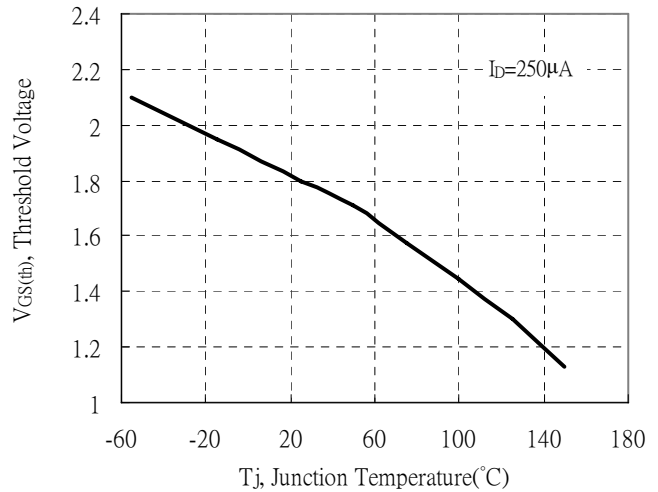


Typical Characteristics(Cont.)

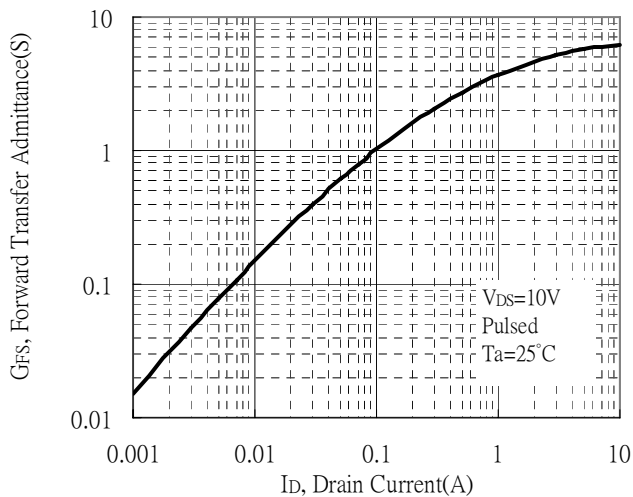
Capacitance vs Drain-to-Source Voltage



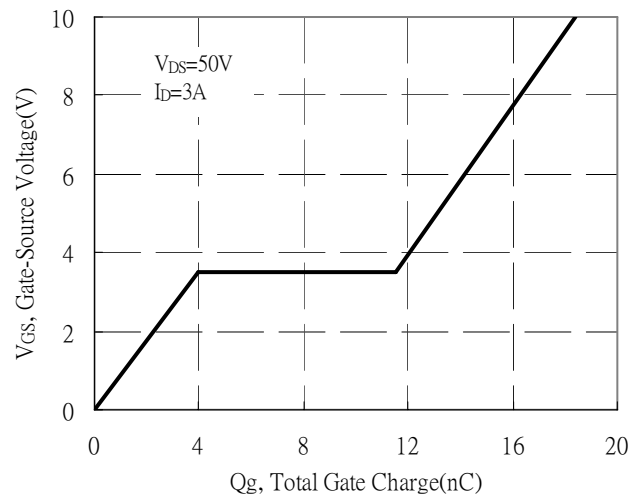
Threshold Voltage vs Junction Temperature



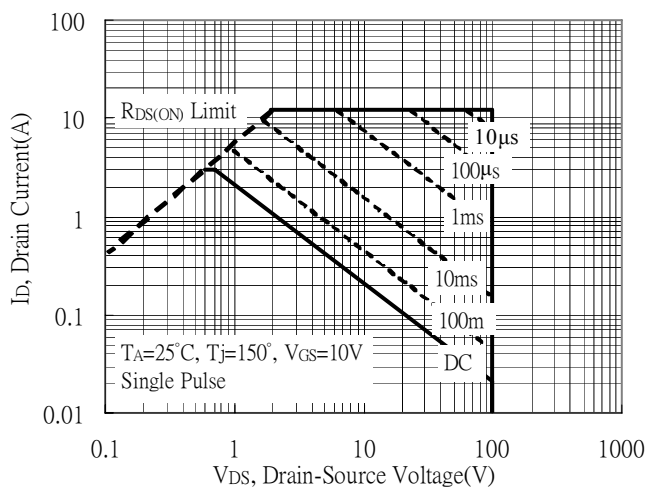
Forward Transfer Admittance vs Drain Current



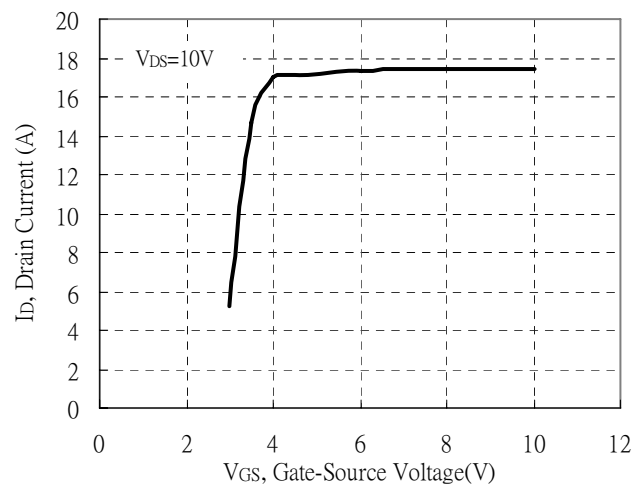
Gate Charge Characteristics



Maximum Safe Operating Area

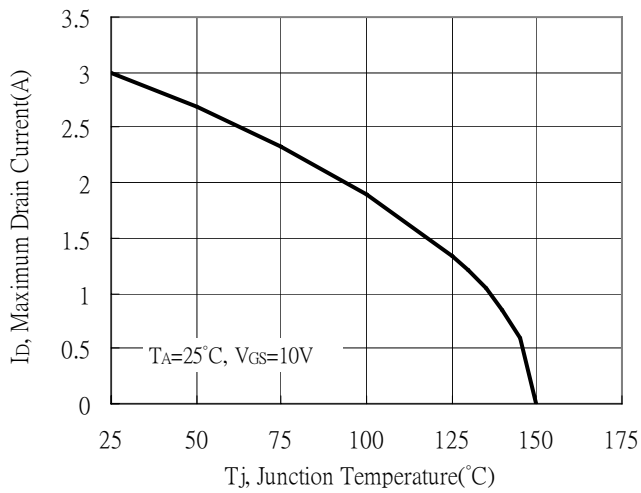


Typical Transfer Characteristics

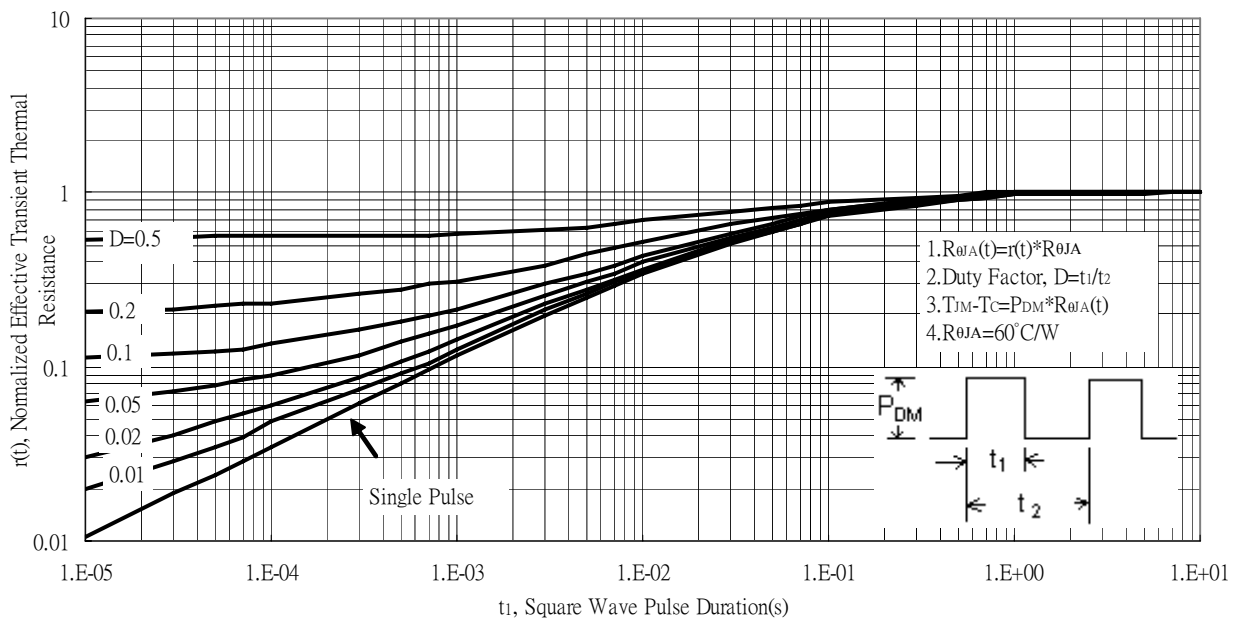


Typical Characteristics(Cont.)

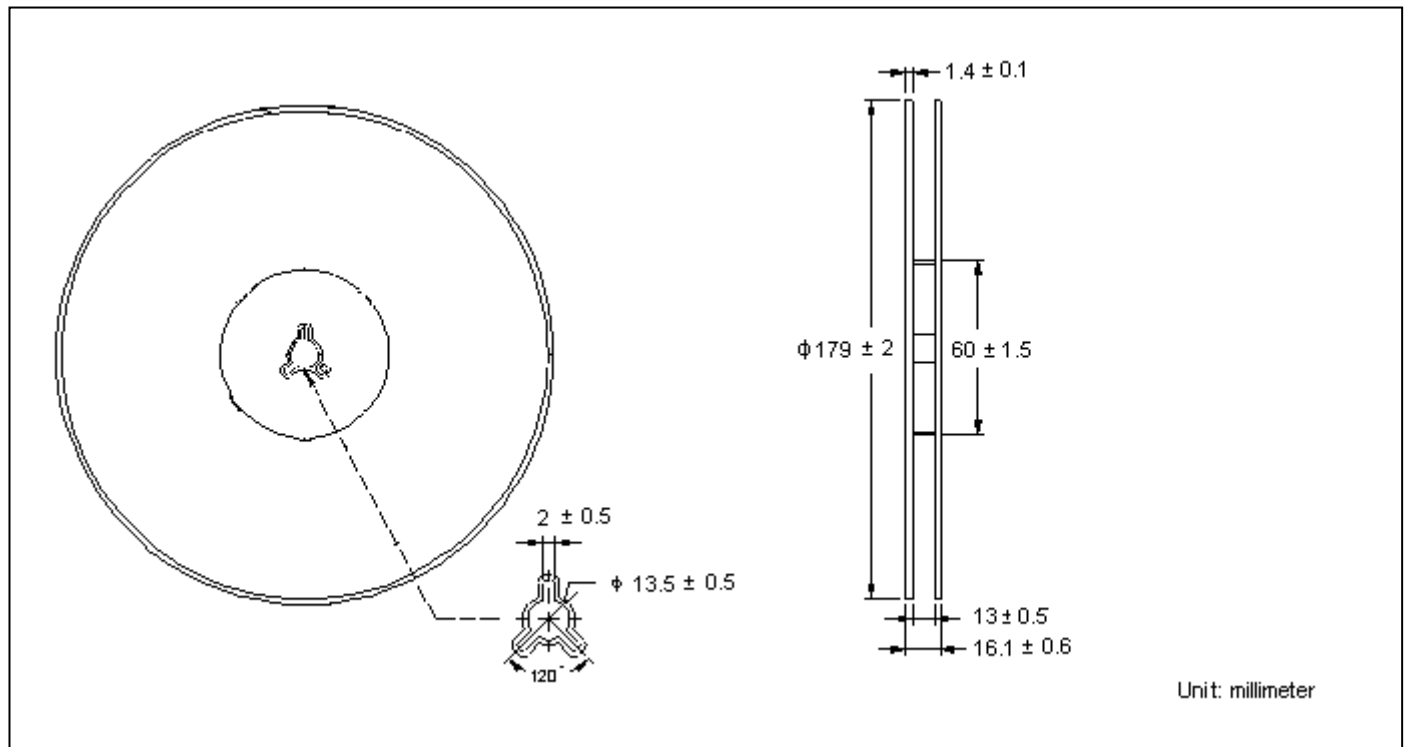
Maximum Drain Current vs Junction Temperature



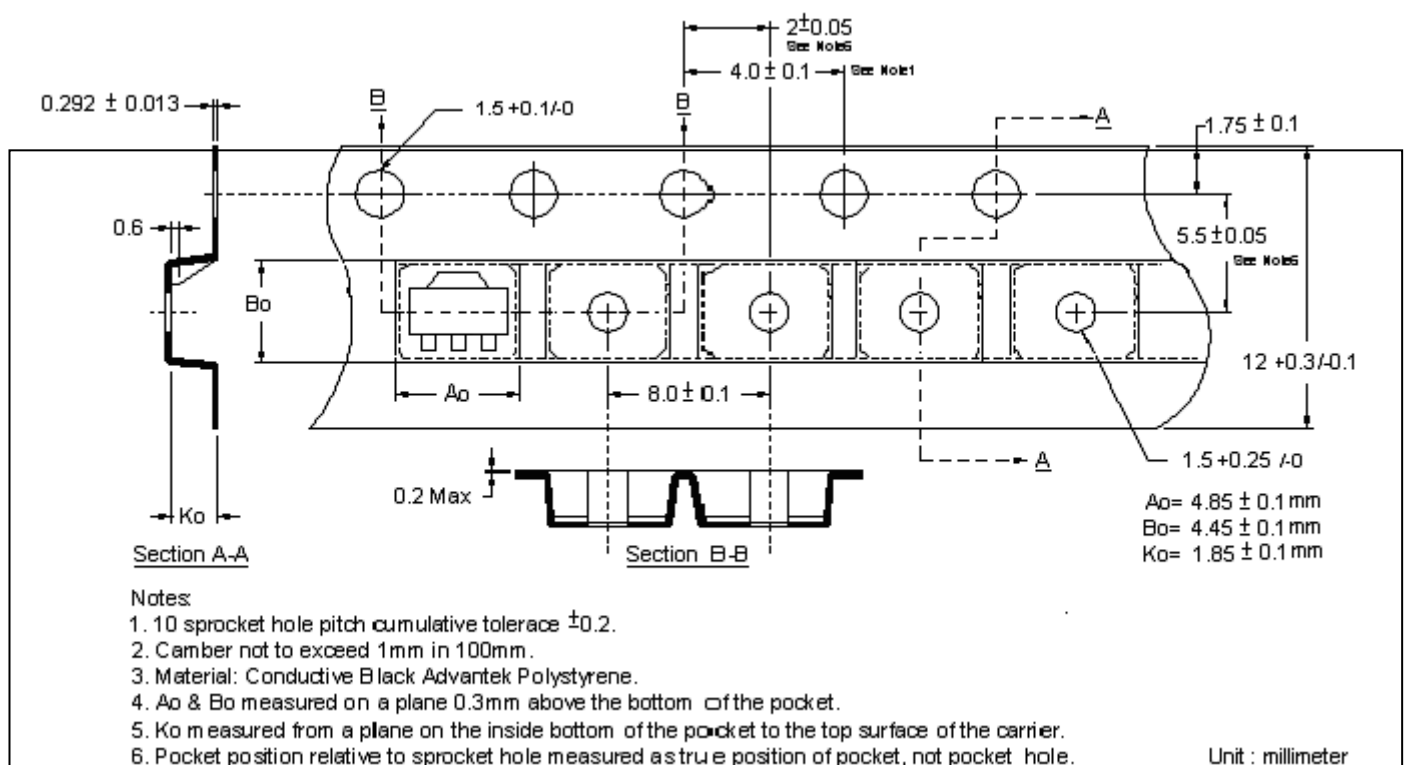
Transient Thermal Response Curves



Reel Dimension



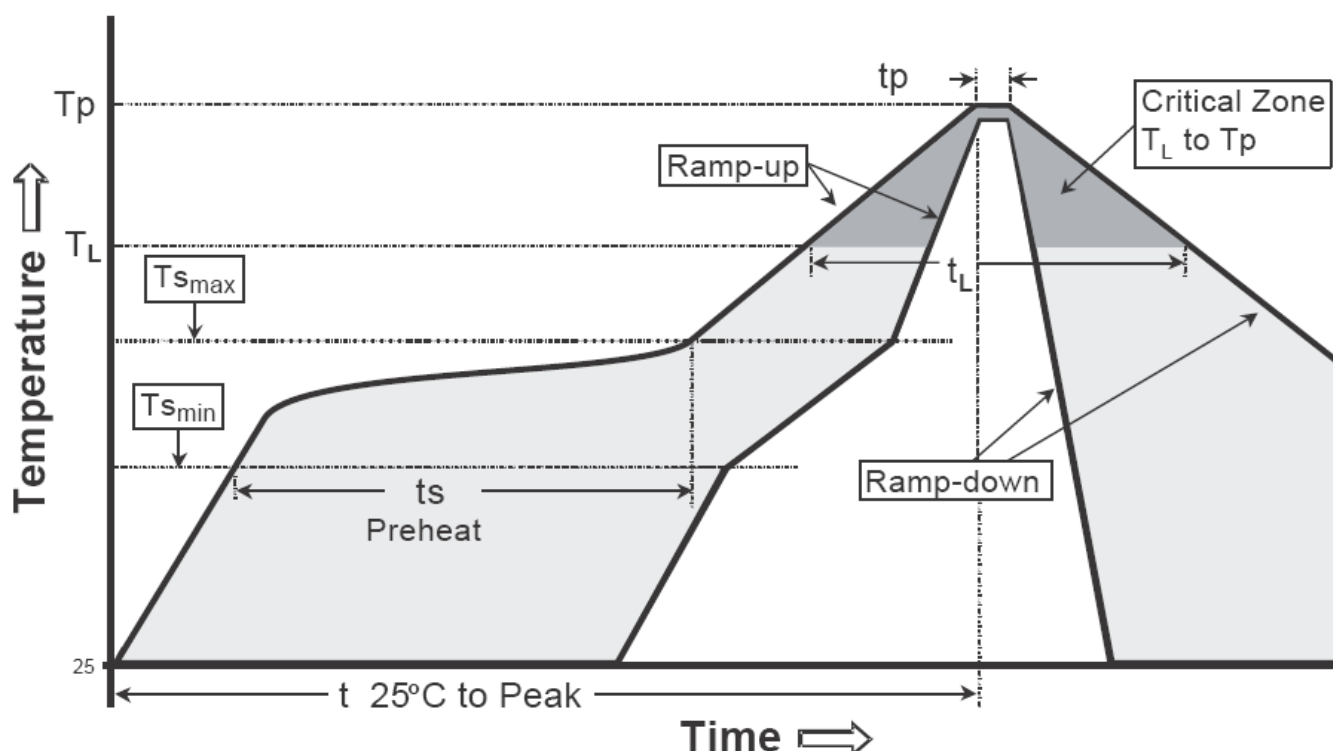
Carrier Tape Dimension



Recommended wave soldering condition

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

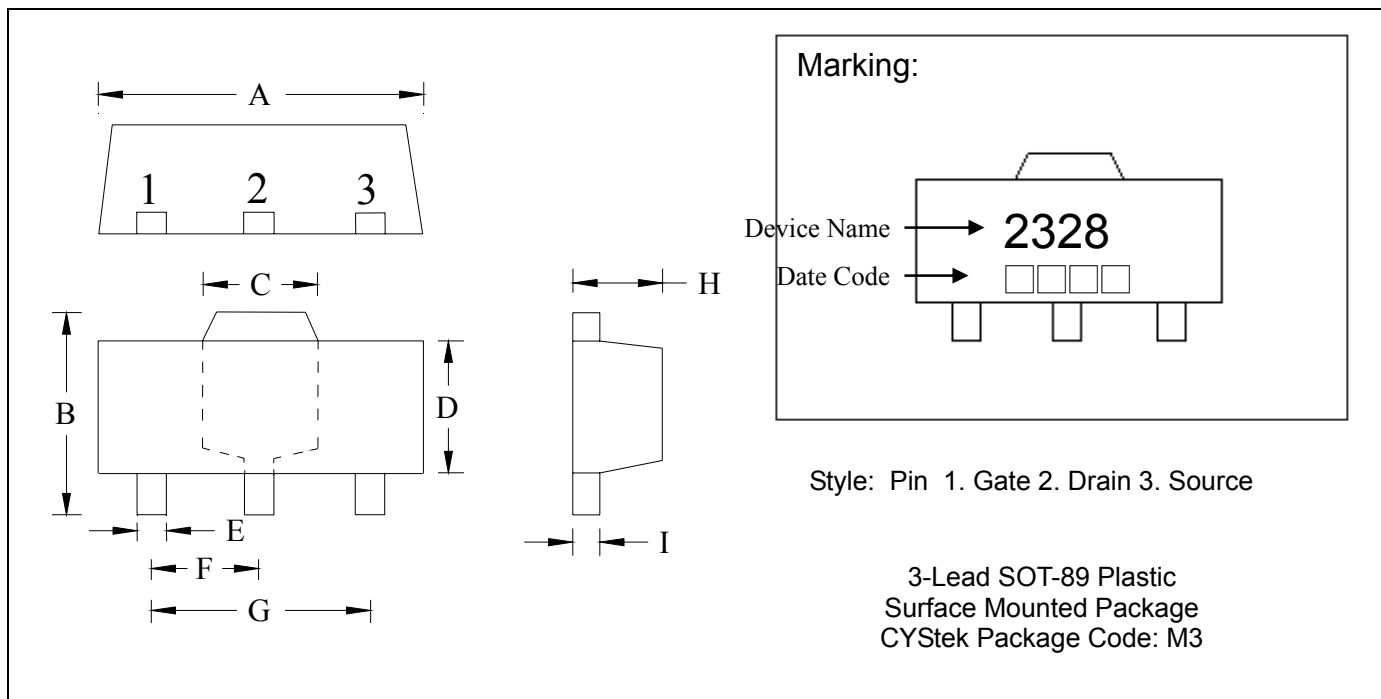
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts 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.

SOT-89 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1732	0.1811	4.40	4.60	F	0.0591	TYP	1.50	TYP
B	0.1551	0.1673	3.94	4.25	G	0.1181	TYP	3.00	TYP
C	0.0610	REF	1.55	REF	H	0.0551	0.0630	1.40	1.60
D	0.0906	0.1024	2.30	2.60	I	0.0138	0.0173	0.35	0.44
E	0.0126	0.0205	0.32	0.52					

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.

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