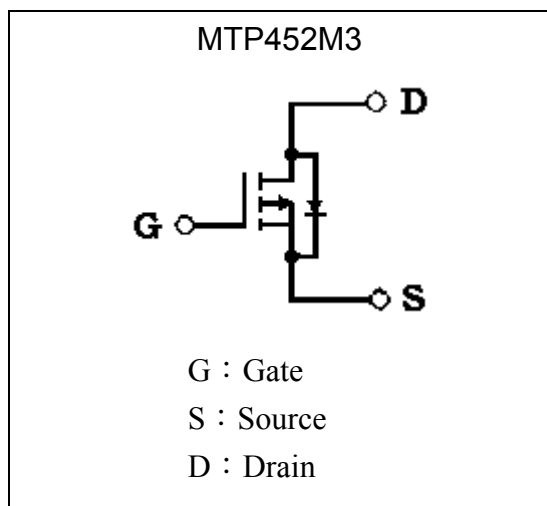
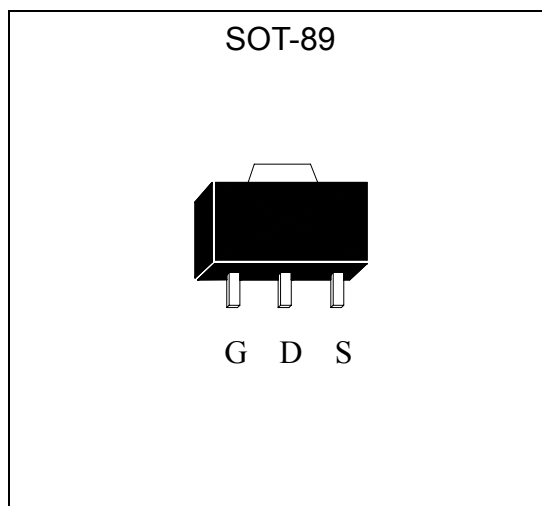


30V P-CHANNEL Enhancement Mode MOSFET

MTP452M3

Features

- Single Drive Requirement
- Low On-resistance, $R_{DS(ON)}=50m\Omega$ (typ.)@ $V_{GS}=-10V$, $I_D=-3.2A$
 $R_{DS(ON)}=72m\Omega$ (typ.)@ $V_{GS}=-4.5V$, $I_D=-2.6A$
- Ultra High Speed Switching
- Pb-free package

Symbol

Outline

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

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current @ $T_A=25^\circ C$	I_D	-5.3	A
Continuous Drain Current @ $T_A=70^\circ C$	I_D	-4.2	A
Pulsed Drain Current	I_{DM}	-20 *1, 3	A
Total Power Dissipation ($T_A=25^\circ C$)	P_D	2 *2	W
Total Power Dissipation ($T_A=70^\circ C$)		1.3 *2	
Operating Junction and Storage Temperature	T_j, T_{stg}	-55~+150	$^\circ C$

Note : *1. Pulse width limited by maximum junction temperature

*2. Surface mounted on 1 in² copper pad of FR-4 board; 270 $^\circ C/W$ when mounted on min. copper pad

*3. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

**Thermal Performance**

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient	R_{thja}	62.5	°C/W

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

Electrical Characteristics (T_j=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-30	-	-	V	V _{GS} =0, I _D =-250μA
V _{GS(th)}	-1.0	-1.6	-2.5	V	V _{DS} =V _{GS} , I _D =-250μA
G _{FS}	-	5.6	-	S	V _{DS} =-5V, I _D =-3A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0
I _{DSS}	-	-	-1	μA	V _{DS} =-30V, V _{GS} =0
	-	-	-25	μA	V _{DS} =-24V, V _{GS} =0 (T _j =70°C)
*R _{DS(ON)}	-	50	60	mΩ	I _D =-3.2A, V _{GS} =-10V
	-	72	80		I _D =-2.6A, V _{GS} =-4.5V
Dynamic					
C _{iss}	-	619	-	pF	V _{DS} =-25V, V _{GS} =0, f=1MHz
C _{oss}	-	55	-		
C _{rss}	-	49	-		
*t _{d(ON)}	-	7	-	ns	V _{DS} =-15V, I _D =-1A, V _{GS} =-10V R _G =3.3 Ω
*t _r	-	3	-		
*t _{d(OFF)}	-	20	-		
*t _f	-	15	-		
*Q _g	-	11	-	nC	V _{DS} =-15V, I _D =-5.3A, V _{GS} =-10V,
*Q _{gs}	-	2.3	-		
*Q _{gd}	-	4.3	-		
Source-Drain Diode					
*V _{SD}	-	-0.8	-1.2	V	V _{GS} =0V, I _S =-1.2A
*t _{rr}	-	22	-	ns	I _S =-3.2A, V _{GS} =0, dI/dt=100A/μs
*Q _{rr}	-	18	-	nC	

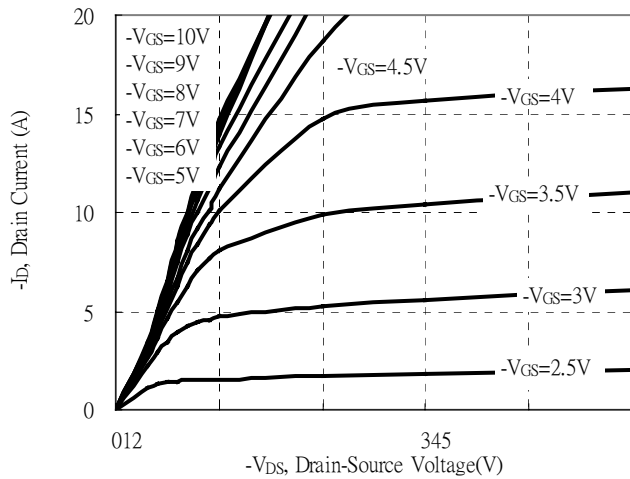
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Ordering Information

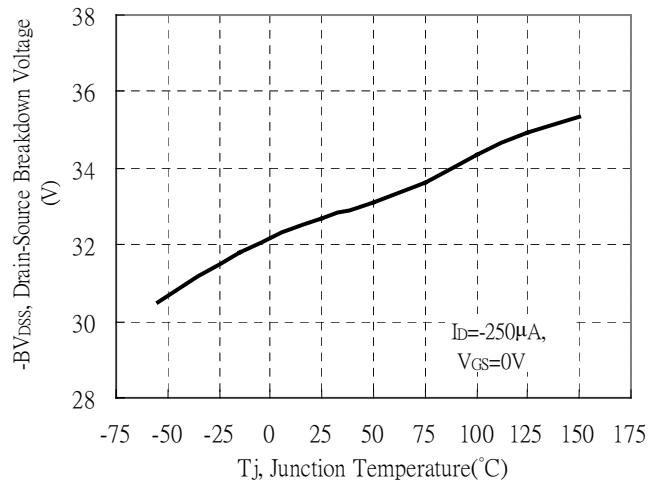
Device	Package	Shipping	Marking
MTP452M3	SOT-89 (Pb-free)	1000 pcs / Tape & Reel	452

Typical Characteristics

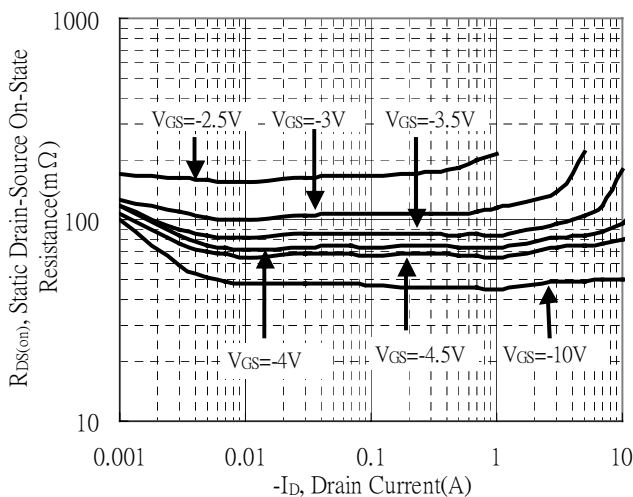
Typical Output Characteristics



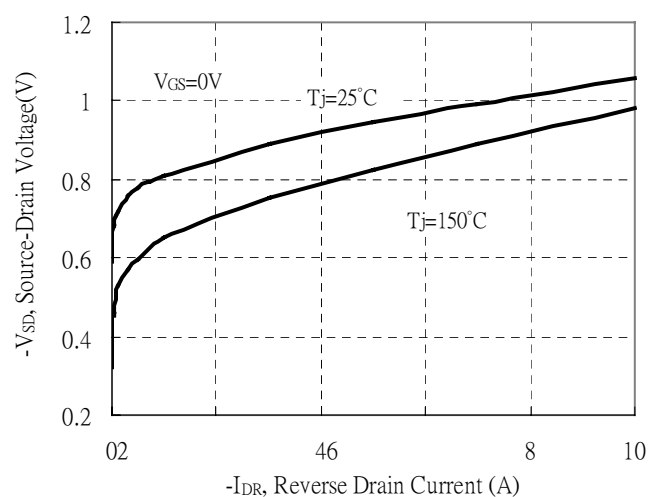
Breakdown Voltage vs Ambient Temperature



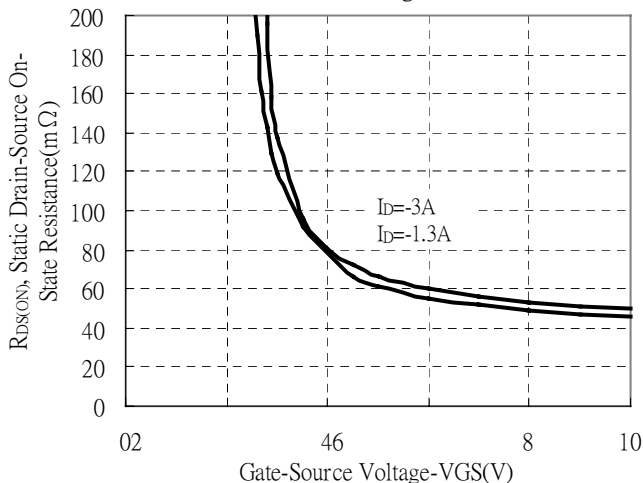
Static Drain-Source On-State resistance vs Drain Current



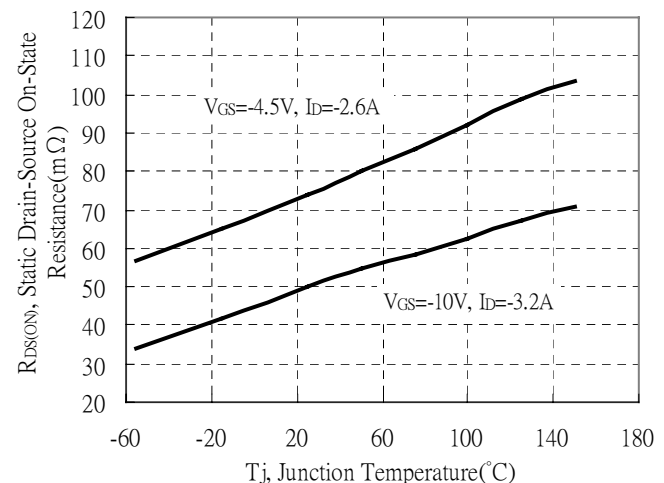
Reverse Drain Current vs Source-Drain Voltage



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

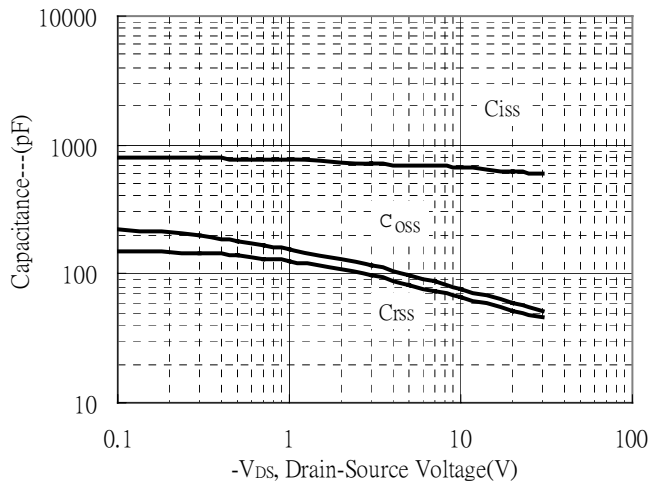


Drain-Source On-State Resistance vs Junction Temperature

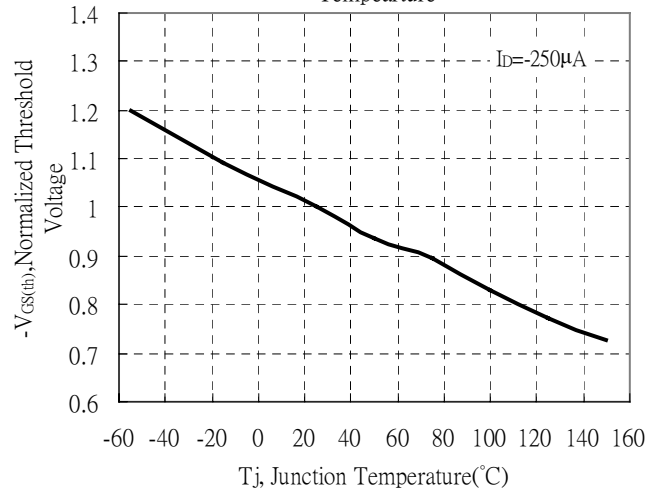


Typical Characteristics(Cont.)

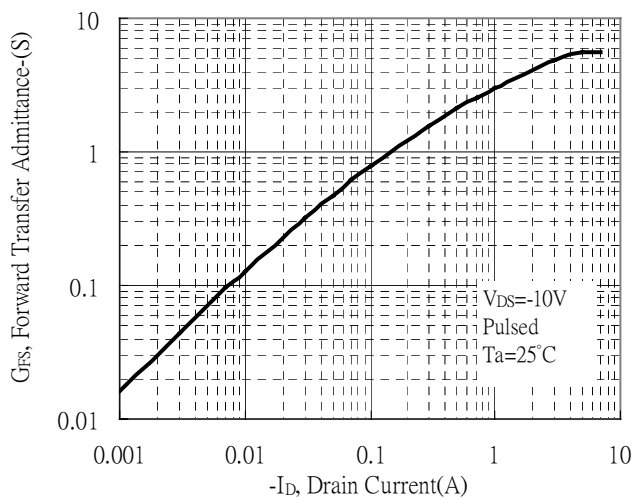
Capacitance vs Drain-to-Source Voltage



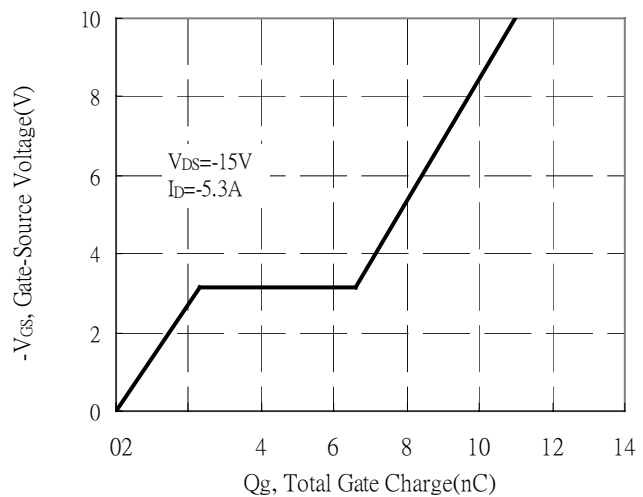
Normalized Threshold Voltage vs Junction Temperature



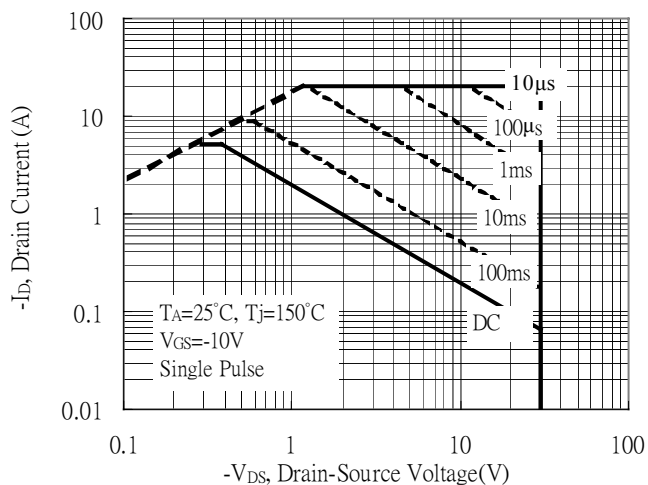
Forward Transfer Admittance vs Drain Current



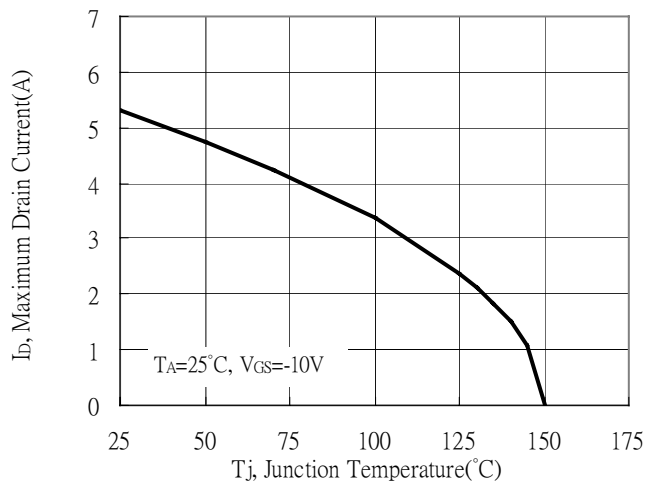
Gate Charge Characteristics



Maximum Safe Operating Area

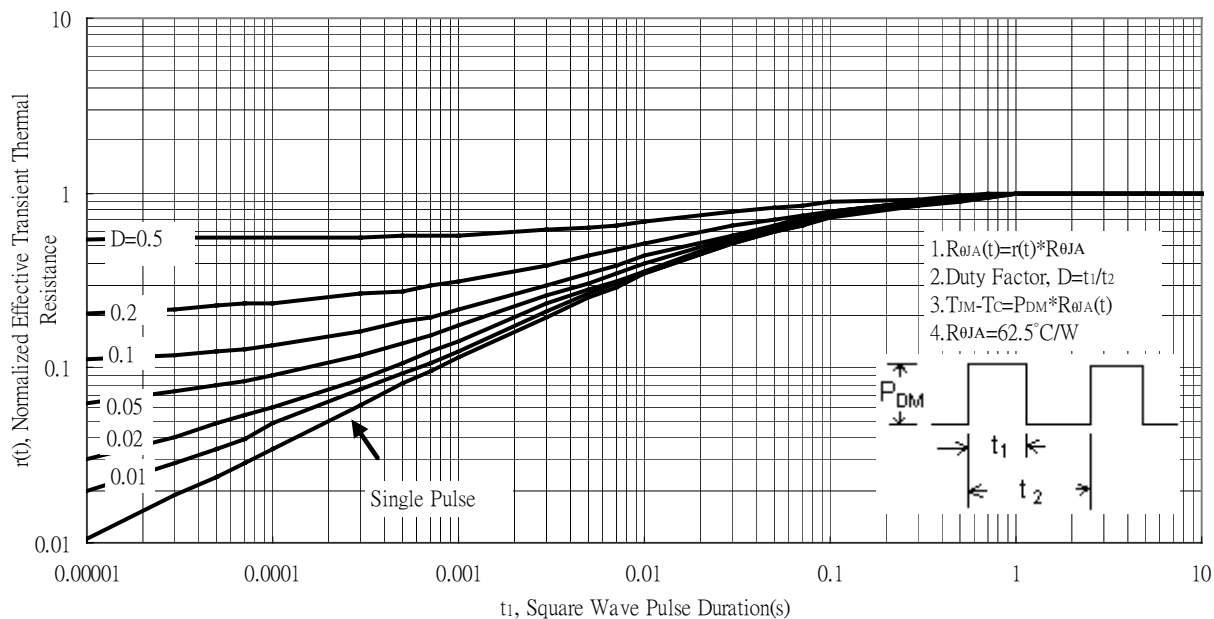


Maximum Drain Current vs Junction Temperature

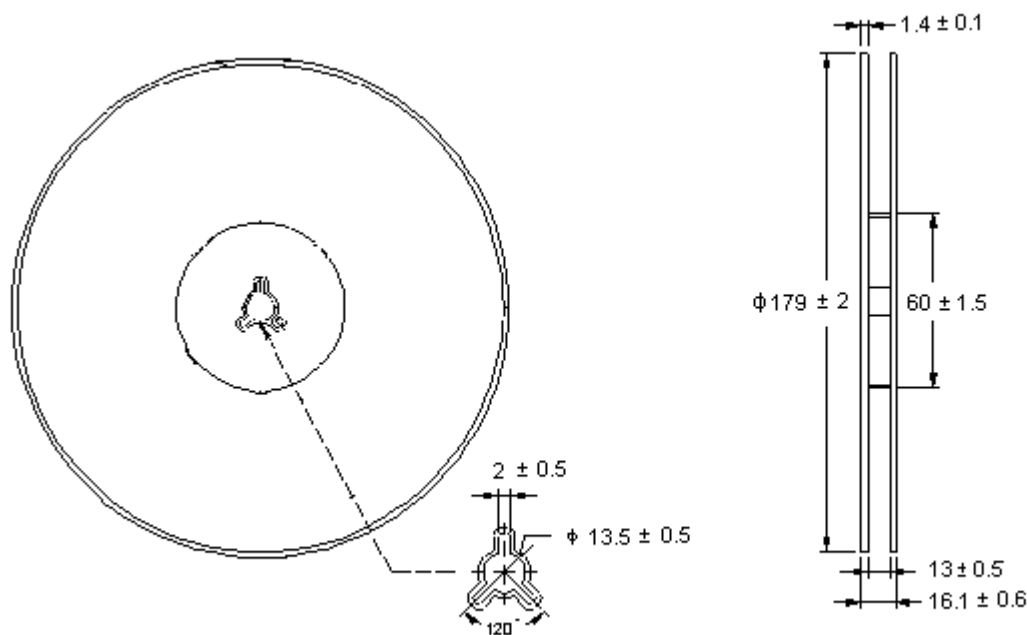


Typical Characteristics(Cont.)

Transient Thermal Response Curves

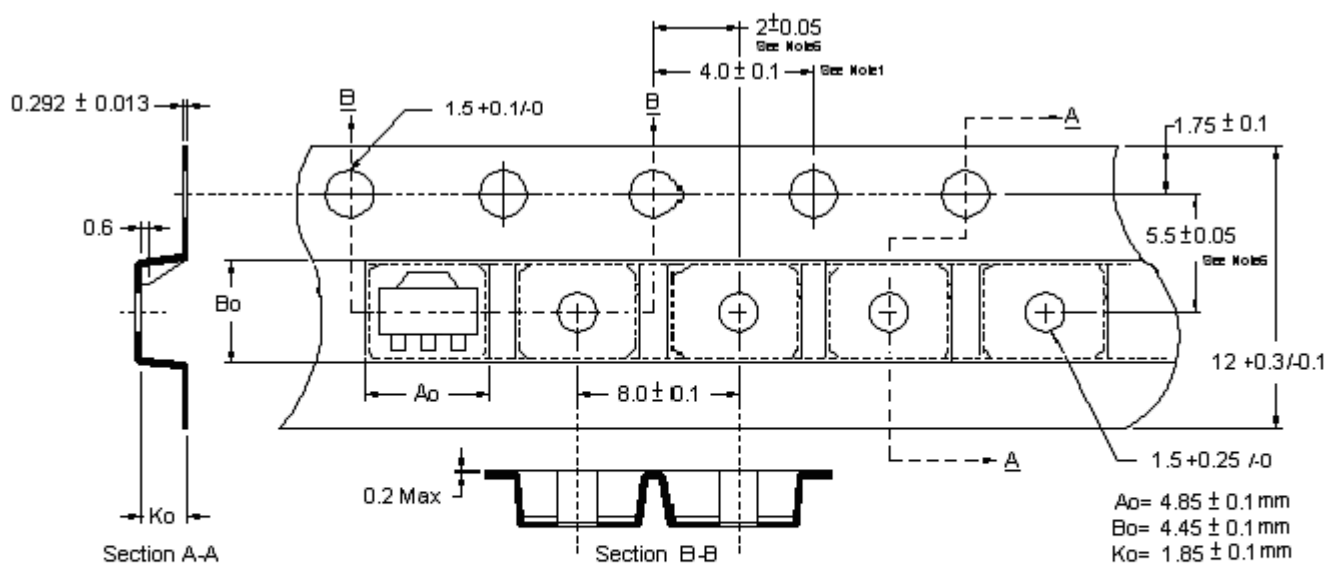


Reel Dimension



Unit: millimeter

Carrier Tape Dimension



Notes

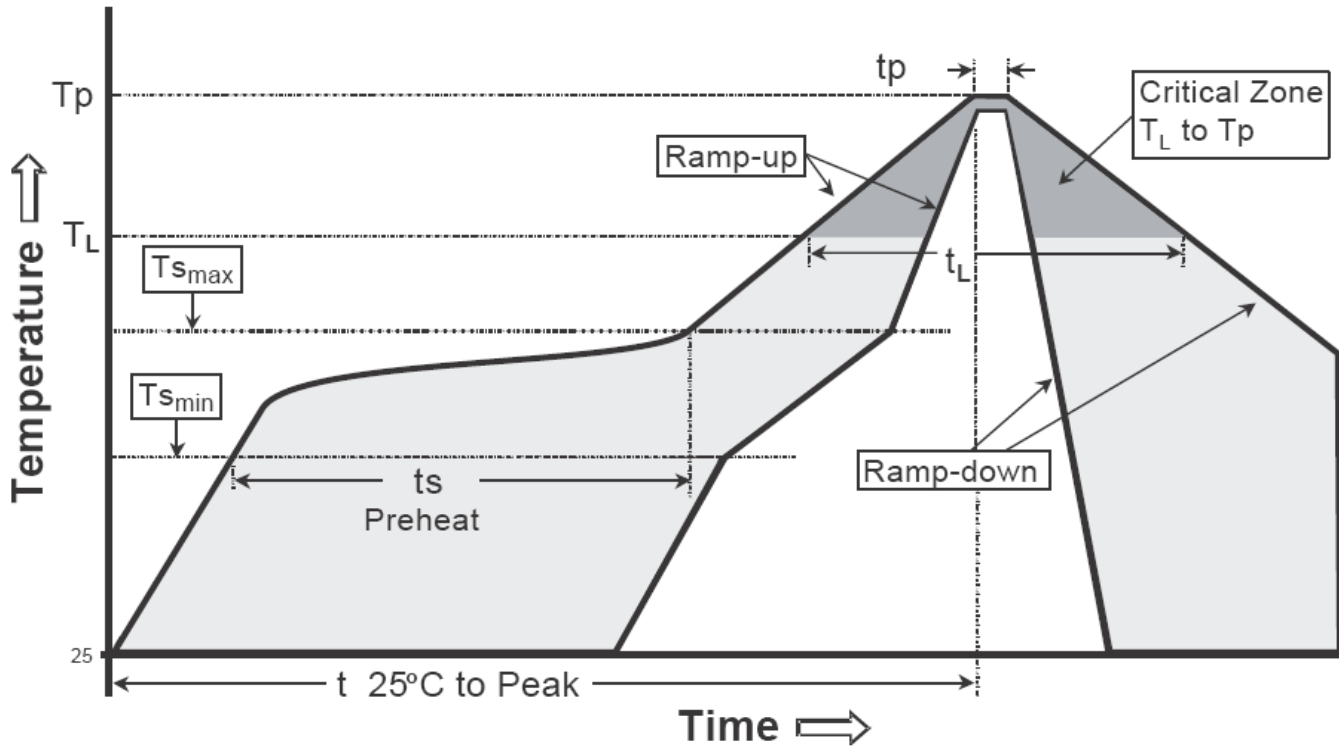
1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. A_0 & B_0 measured on a plane 0.3mm above the bottom of the pocket.
5. K_0 measured from a plane on the inside bottom of the pocket to the top surface of 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

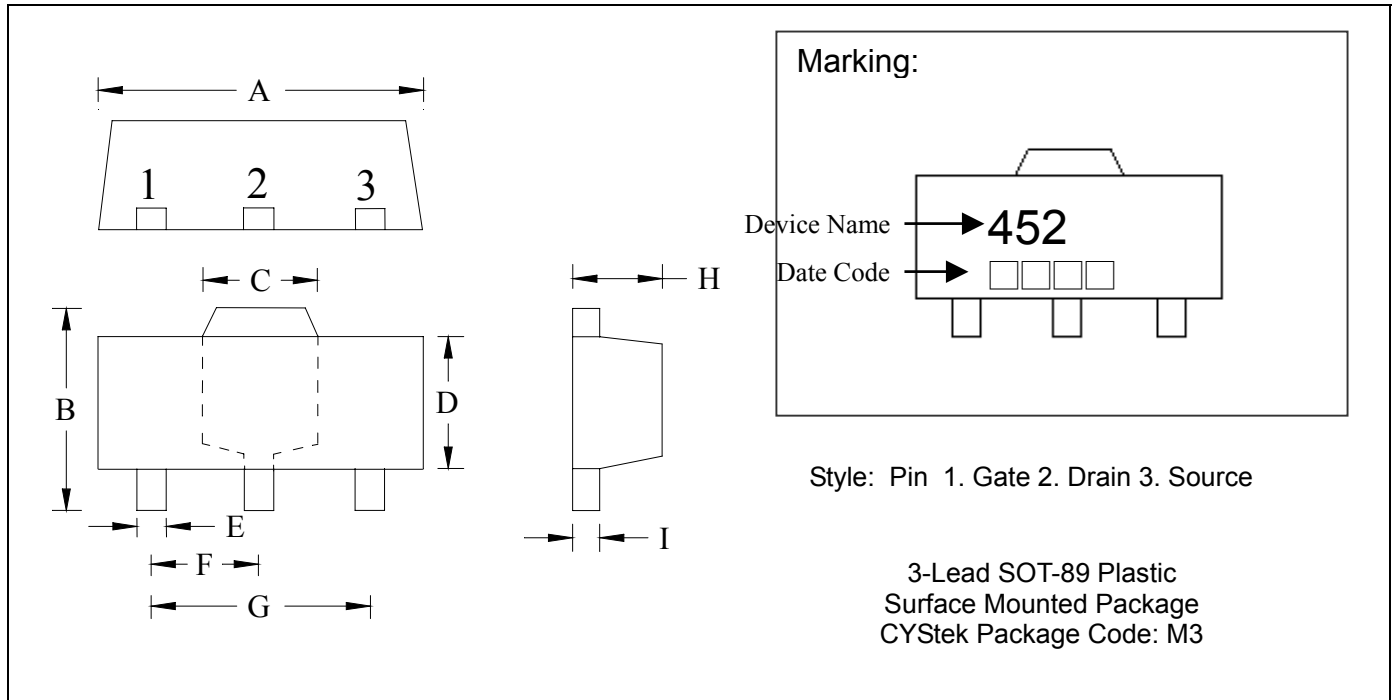
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} 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(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	0.0583	0.0598	1.48	1.527
B	0.1594	0.1673	4.05	4.25	G	0.1165	0.1197	2.96	3.04
C	0.0591	0.0663	1.50	1.70	H	0.0551	0.0630	1.40	1.60
D	0.0945	0.1024	2.40	2.60	I	0.0138	0.0161	0.35	0.41
E	0.01417	0.0201	0.36	0.51					

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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