60V N-CHANNEL Enhancement Mode MOSFET

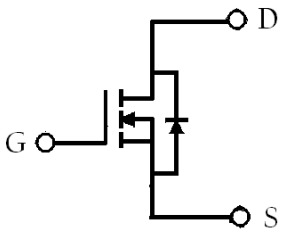
MTN2310M3

Features

- V_{DS}=60V
  $R_{DS(ON)}$=90mΩ(max.)@V_{GS}=10V, I_{DS}=3A
  $R_{DS(ON)}$=120mΩ(max.)@V_{GS}=4.5V, I_{DS}=2A
- Simple drive requirement
- Small package outline

Symbol

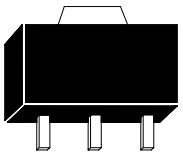
MTN2310M3



G：Gate
S：Source
D：Drain

Outline

SOT-89



G D S

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current @ T_A=25°C (Note 3)	I_D	3.0	A
Continuous Drain Current @ T_A=70°C (Note 3)		2.3	A
Pulsed Drain Current (Notes 1, 2)	I_{DM}	10	A
Maximum Power Dissipation@ T_A=25℃	P_D	1.5	W
Linear Derating Factor		0.01	W/°C
Operating Junction Temperature	Tj	-55~+150	°C
Storage Temperature	Tstg	-55~+150	°C

Note : 1. Pulse width limited by maximum junction temperature.
2. Pulse width≤ 300μs, duty cycle≤2%.
3. Surface mounted on FR-4 board, t≤10sec.

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient(PCB mounted)	Rth,ja	83.3	°C/W

Note : Surface mounted on FR-4 board, t≦10sec.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	60	-	-	V	V_{GS}=0, I_D=250μA
$\Delta BV_{DSS}/\Delta Tj$	-	0.05	-	V/°C	Reference to 25°C, I_D=1mA
$V_{GS(th)}$	1.0	-	3.0	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	10	μA	V_{DS}=60V, V_{GS}=0
I_{DSS}	-	-	25	μA	V_{DS}=48V, V_{GS}=0 (Tj=70°C)
*$R_{DS(ON)}$	-	-	90	mΩ	I_D=3A, V_{GS}=10V
	-	-	120		I_D=2A, V_{GS}=4.5V
*G_{FS}	-	5	-	S	V_{DS}=5V, I_D=3A
Dynamic					
Ciss	-	490	780	pF	V_{DS}=25V, V_{GS}=0, f=1MHz
Coss	-	55	-		
Crss	-	40	-		
$t_{d(ON)}$	-	6	-	ns	V_{DS}=30V, I_D=1A, R_D=30Ω V_{GS}=10V, R_G=3.3Ω
t_r	-	5	-		
$t_{d(OFF)}$	-	16	-		
t_f	-	3	-		
Qg	-	6	10	nC	V_{DS}=48V, I_D=3A, V_{GS}=4.5V,
Qgs	-	1.6	-		
Qgd	-	3	-		
Source-Drain Diode					
*V_{SD}	-	-	1.2	V	V_{GS}=0V, I_S=1.2A
Trr	-	25	-	ns	V_{GS}=0V, I_S=3A, dI/dt=100A/μs
Qrr	-	26	-	nC	

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

Characteristic Curves

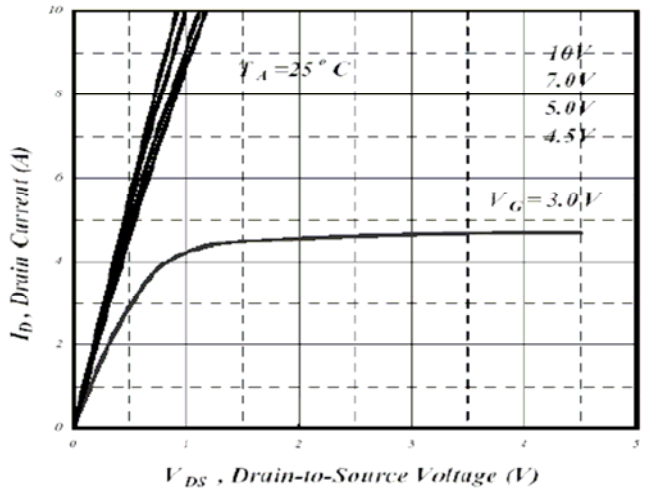


Fig 1. Typical Output Characteristics

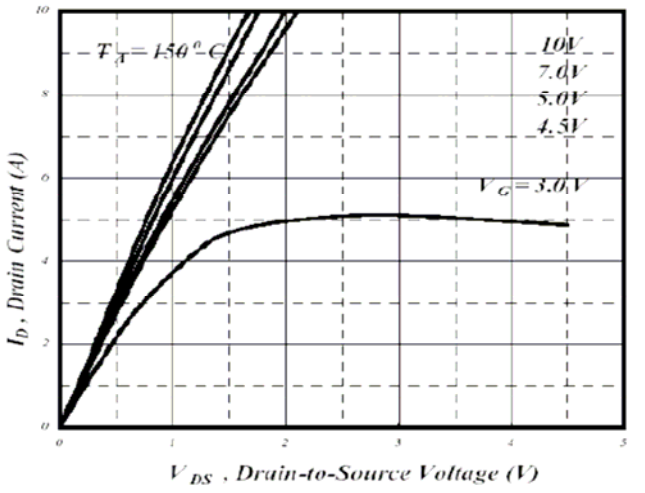


Fig 2. Typical Output Characteristics

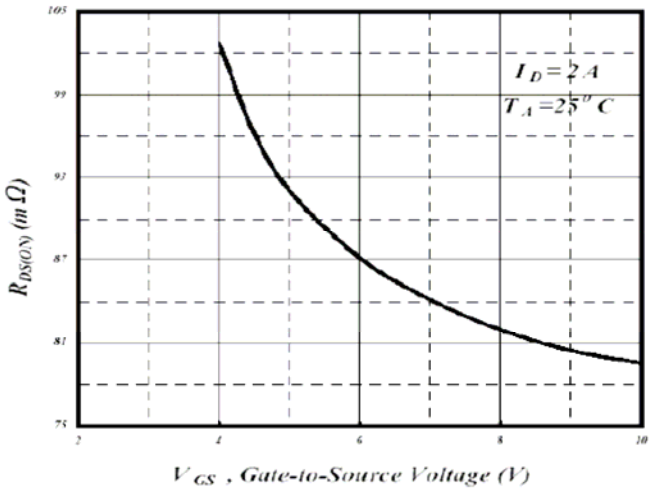


Fig 3. On-Resistance v.s. Gate Voltage

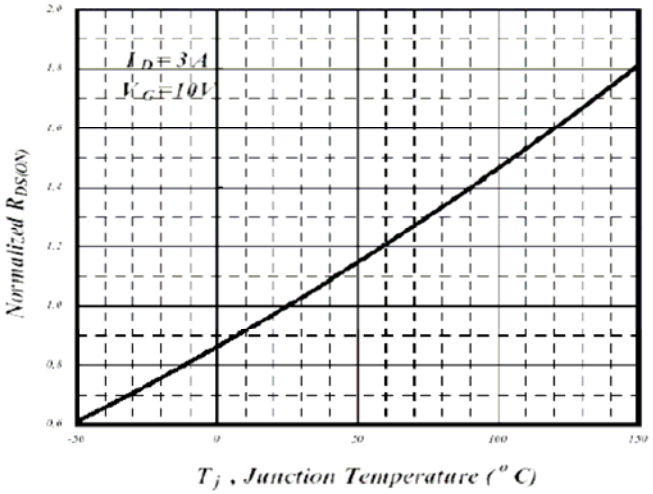


Fig 4. Normalized On-Resistance v.s. Junction Temperature

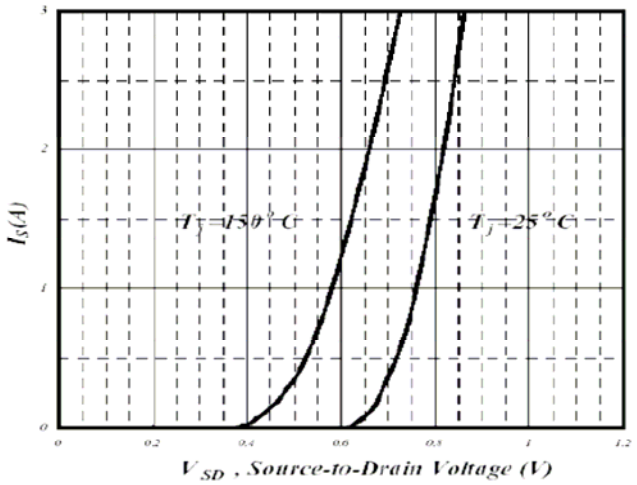


Fig 5. Forward Characteristics of Reverse Diode

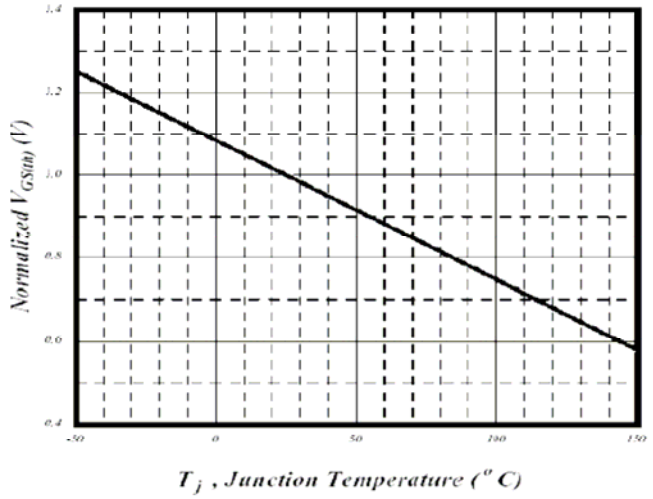


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

Characteristic Curves(Cont.)

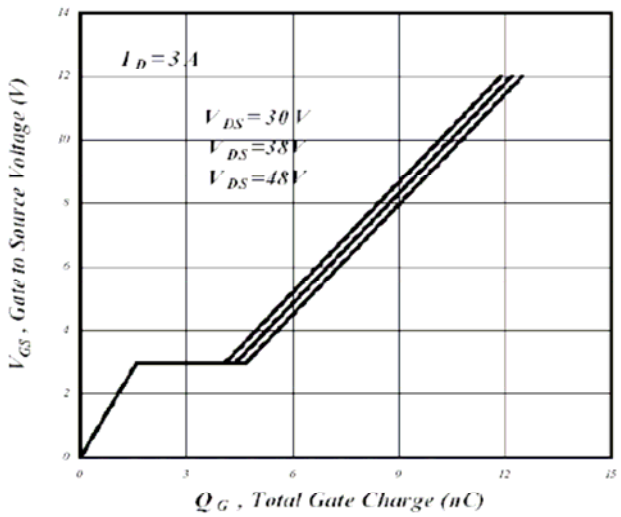


Fig 7. Gate Charge Characteristics

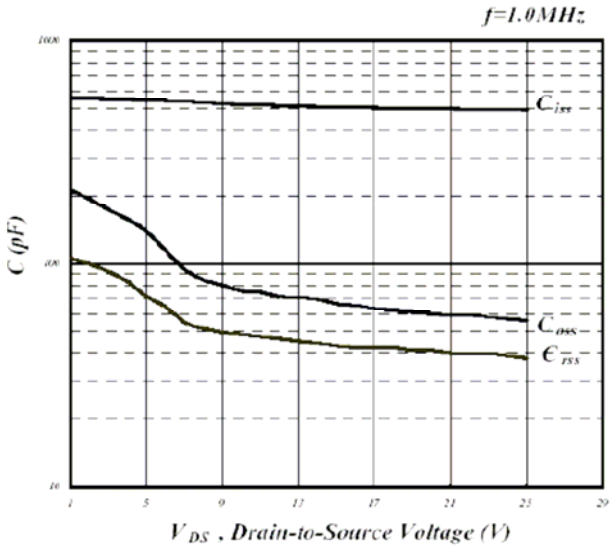


Fig 8. Typical Capacitance Characteristics

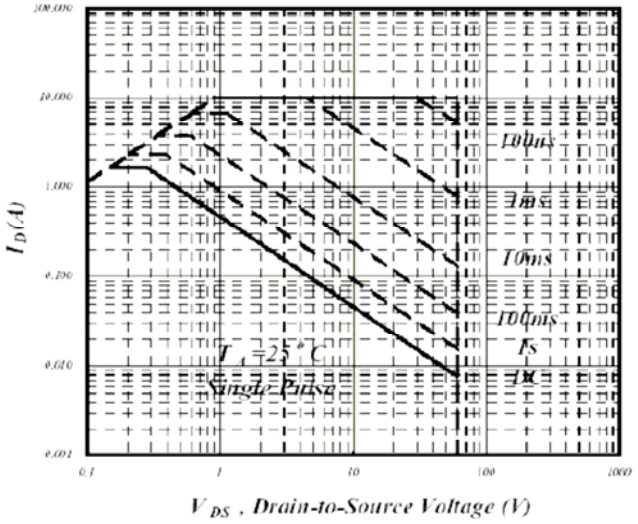


Fig 9. Maximum Safe Operating Area

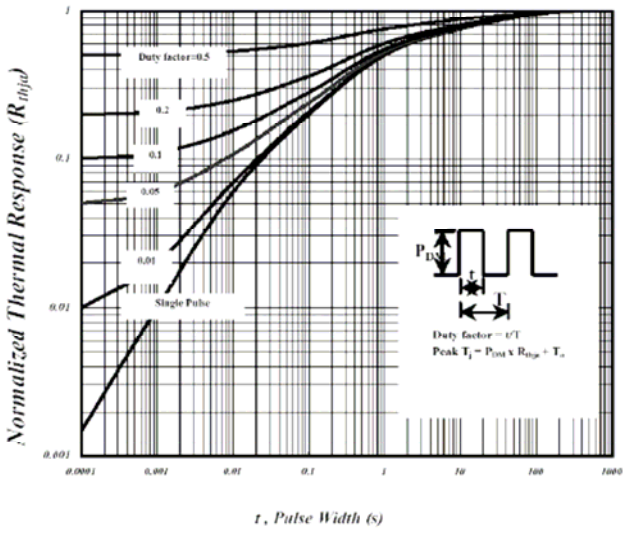


Fig 10. Effective Transient Thermal Impedance

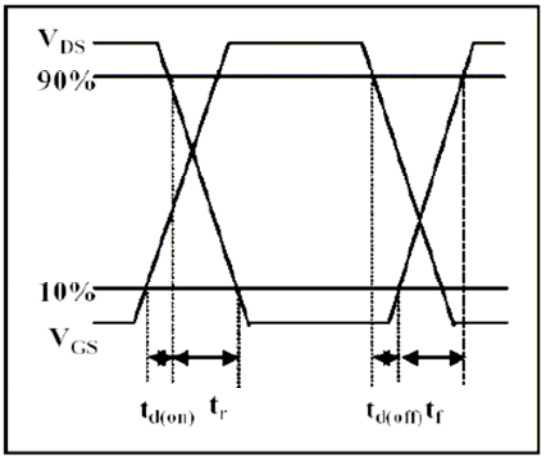


Fig 11. Switching Time Waveform

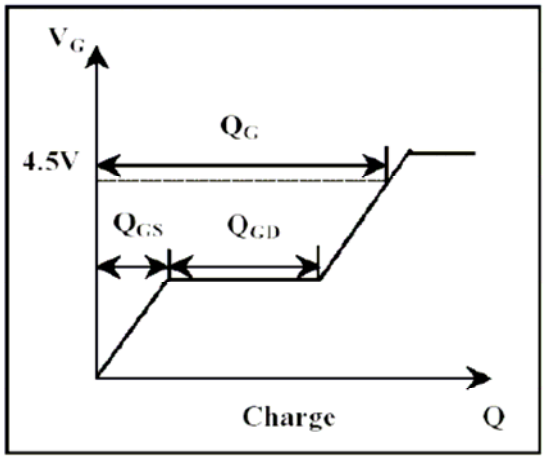
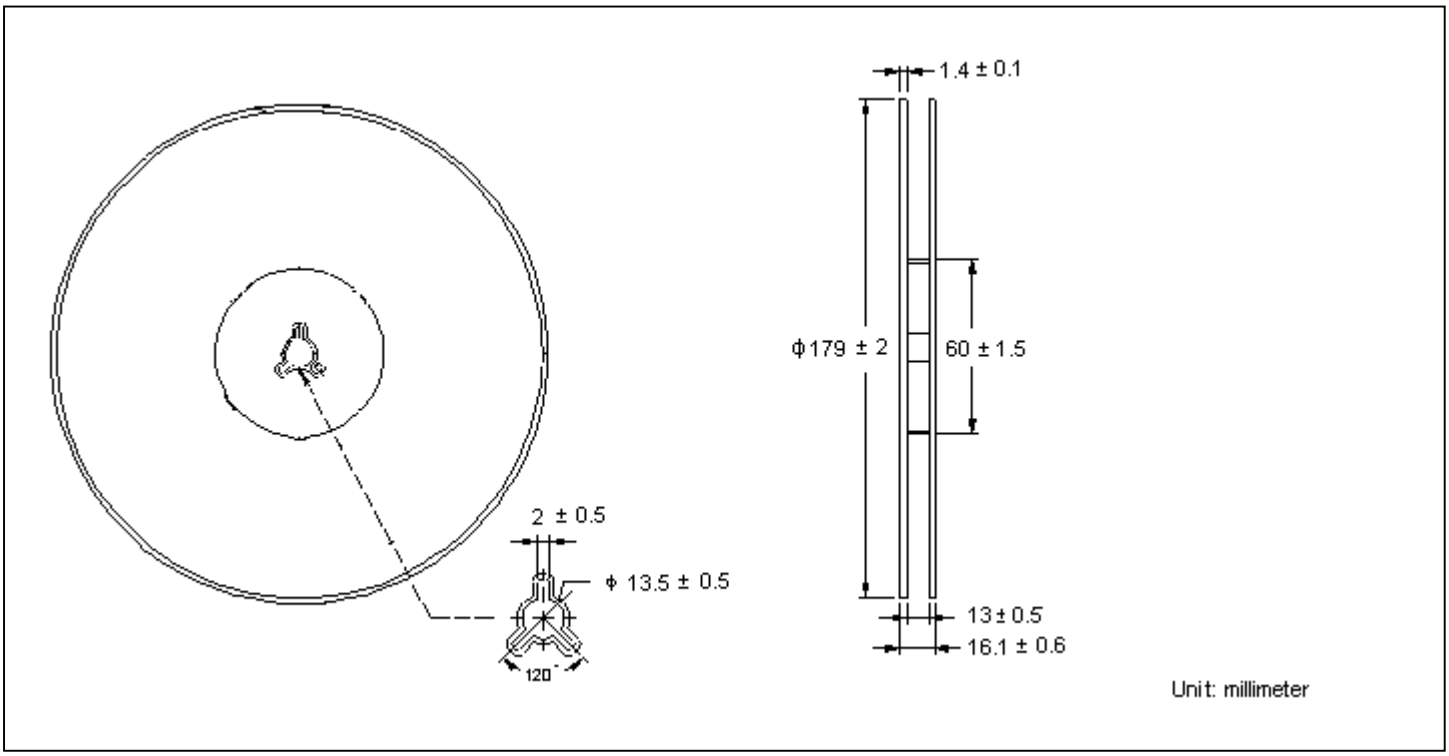
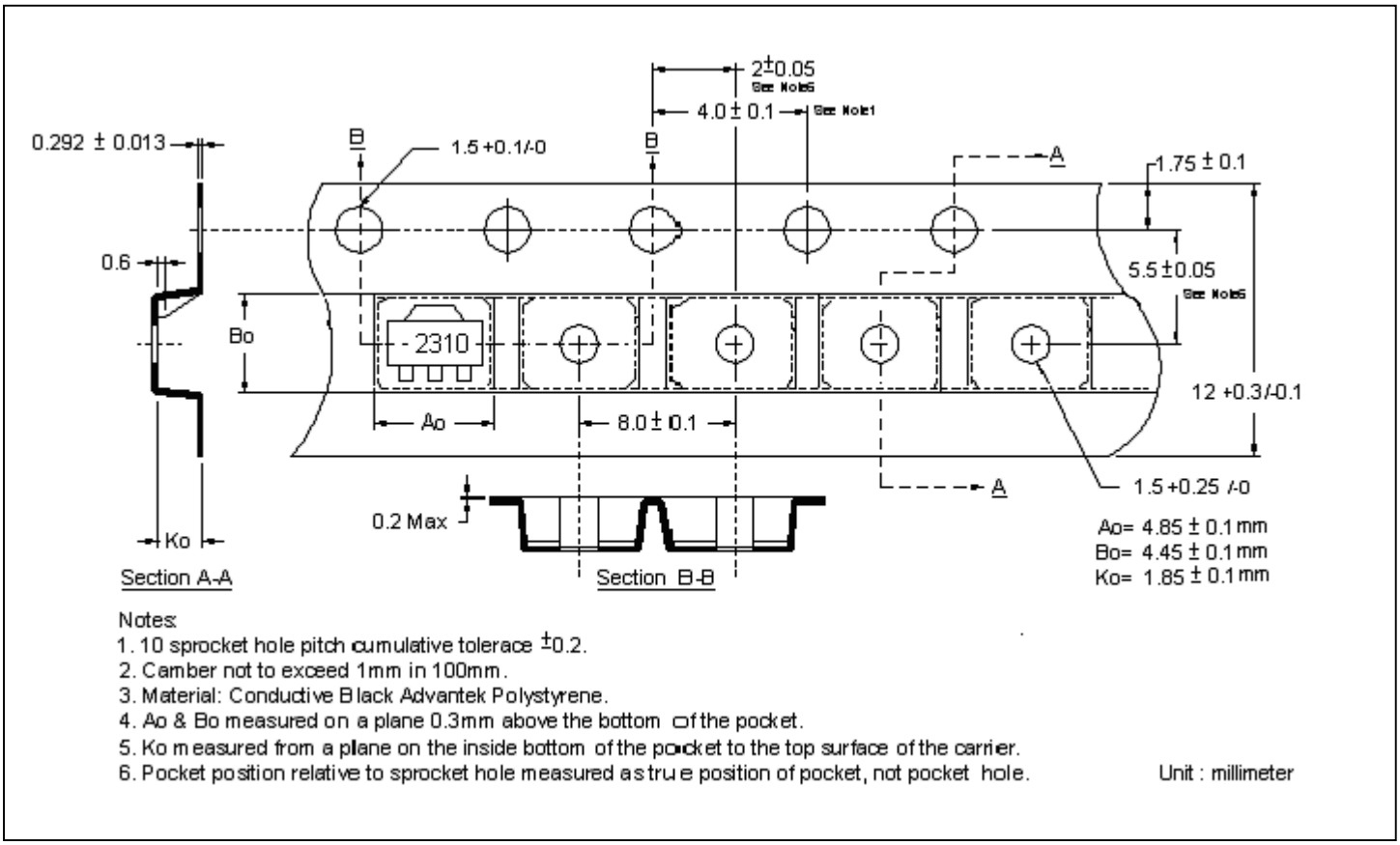


Fig 12. Gate Charge Waveform

Reel Dimension



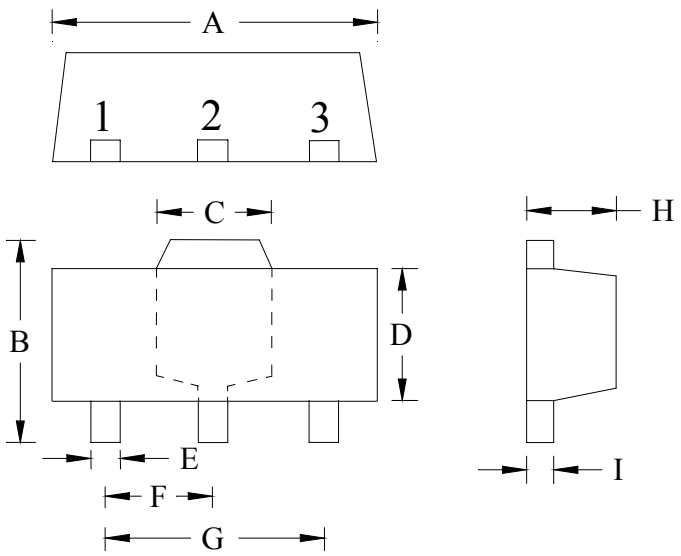
Carrier Tape Dimension



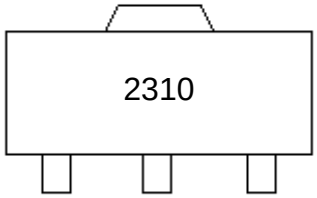
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of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

Unit : millimeter

SOT-89 Dimension



Marking:



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

3-Lead SOT-89 Plastic
Surface Mounted Package
CYStek Package Code: M3

*: 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: 42 Alloy ; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0