

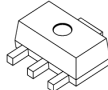
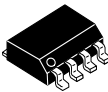
Microtriggered low power thyristor

Features

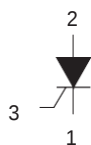
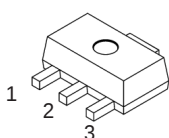
- $I_{T(AV)} : 0.3 \text{ A}$
- $V_{DRM} : 600 \text{ V}$
- $I_{GT} : 100 \mu\text{A}$

Outline

- Non-Insulated Type
- Glass Passivation Type

	SOP89-3 D SUFFIX HT6031ARDZ
	MSOP-8 M SUFFIX HT6031ARMZ
	SOP-8 R SUFFIX HT6031ARZ
	TO92 M SUFFIX HT6031AM
	TO-92-3L T SUFFIX HT6031ARTZ

(Package name:TO-92-3L)



1. Cathode
2. Anode
3. Gate

Applications

Leakage protector, timer, and gas igniter

Maximum Ratings

Parameter	Symbol	Voltage class	Unit
		12	
Repetitive peak reverse voltage	V_{RRM}	600	V
Non-repetitive peak reverse voltage	V_{RSM}	800	V
DC reverse voltage	$V_{R(DC)}$	480	V
Repetitive peak off-state voltage ^{Note1}	V_{DRM}	600	V
Non-repetitive peak off-state voltage ^{Note1}	V_{DSM}	800	V
DC off-state voltage ^{Note1}	$V_{D(DC)}$	480	V

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	0.47	A	
Average on-state current	$I_{T(AV)}$	0.3	A	Commercial frequency, sine half wave 180° conduction, $T_a = 47^\circ\text{C}$
Surge on-state current	I_{TSM}	20	A	60Hz sine half wave 1 full cycle, peak value, non-repetitive
I^2t for fusing	I^2t	1.6	A^2s	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current
Peak gate power dissipation	P_{GM}	0.5	W	
Average gate power dissipation	$P_{G(AV)}$	0.1	W	
Peak gate forward voltage	V_{FGM}	6	V	
Peak gate reverse voltage	V_{RGM}	6	V	
Peak gate forward current	I_{FGM}	0.3	A	
Junction temperature	T_j	- 40 to +110	$^\circ\text{C}$	
Storage temperature	T_{stg}	- 40 to +125	$^\circ\text{C}$	
Mass	—	0.23	g	Typical value

Notes: 1. With gate to cathode resistance $R_{GK} = 1\text{ k}\Omega$.

Electrical Characteristics

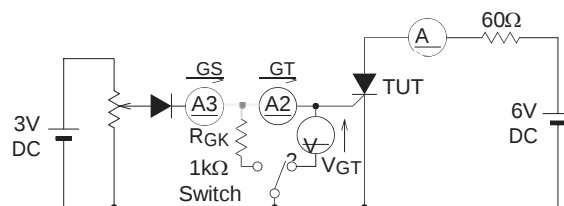
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	I_{RRM}	—	—	0.1	mA	$T_j = 110^\circ\text{C}$, V_{RRM} applied
Repetitive peak off-state current	I_{DRM}	—	—	0.1	mA	$T_j = 110^\circ\text{C}$, V_{DRM} applied, $R_{GK} = 1\text{ k}\Omega$
On-state voltage	V_{TM}	—	—	1.8	V	$T_a = 25^\circ\text{C}$, $I_{TM} = 4\text{ A}$, instantaneous value
Gate trigger voltage	V_{GT}	—	—	0.8	V	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $I_T = 0.1\text{ A}$ ^{Note3}
Gate non-trigger voltage	V_{GD}	0.2	—	—	V	$T_j = 110^\circ\text{C}$, $V_D = 1/2 V_{DRM}$, $R_{GK} = 1\text{ k}\Omega$
Gate trigger current	I_{GT}	1	—	100 ^{Note2}	μA	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $I_T = 0.1\text{ A}$ ^{Note3}
Holding current	I_H	—	1.5	3	mA	$T_j = 25^\circ\text{C}$, $V_D = 12\text{ V}$, $R_{GK} = 1\text{ k}\Omega$
Thermal resistance	$R_{th(j-a)}$	—	—	180	$^\circ\text{C/W}$	Junction to ambient

Notes: 2. Please refer to the last letter of the model on the label for I_{GT} value. If special I_{GT} values are required, select item D or E in the table below. If you need a specified I_{GT} value, contact the manufacturer.

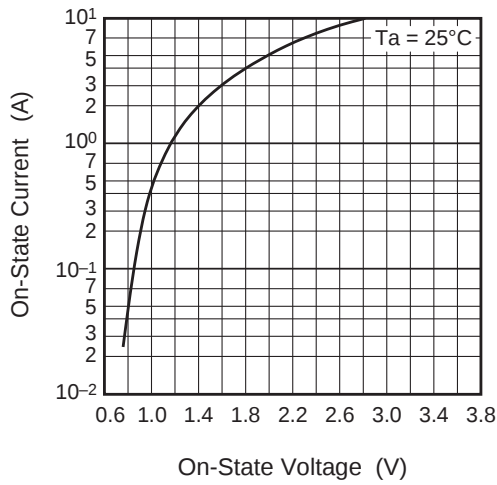
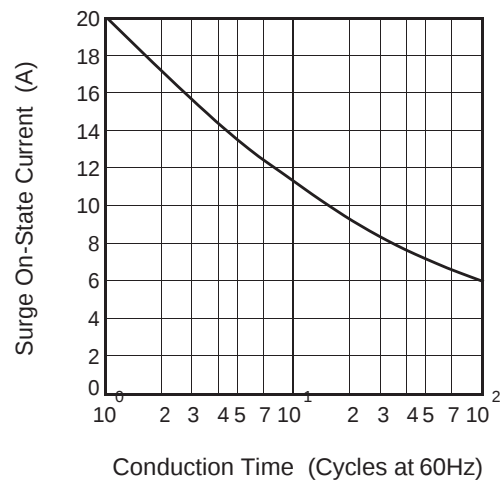
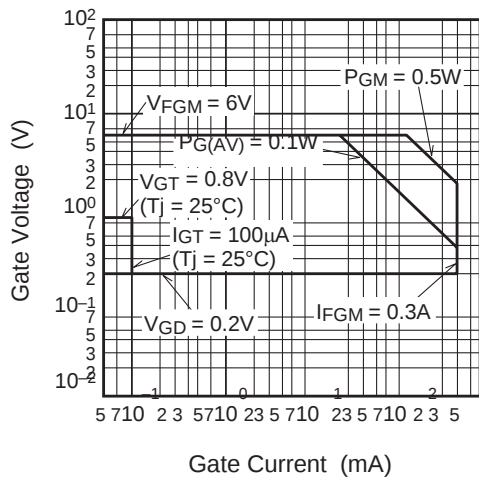
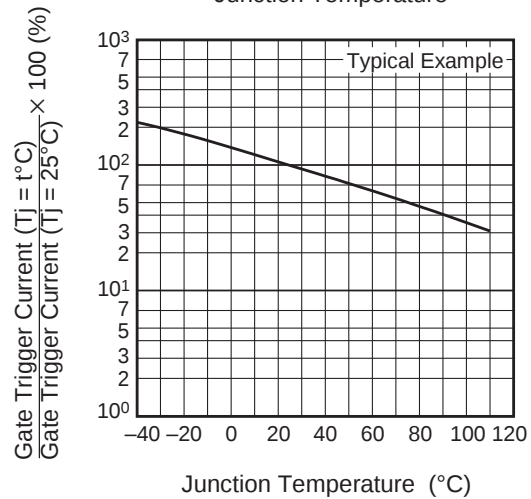
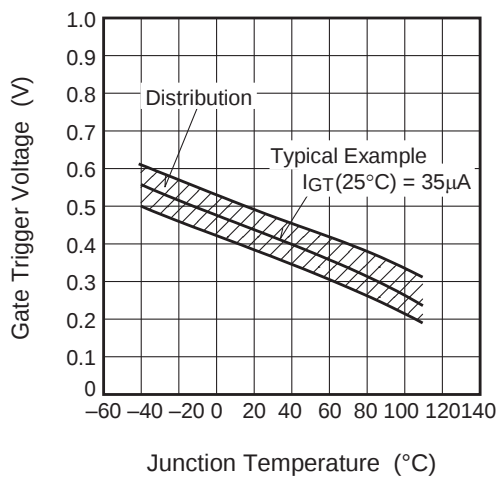
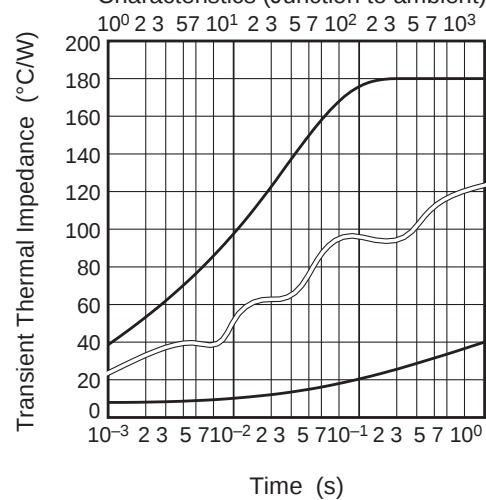
Item	A	B	C	D	E
$I_{GT} (\mu\text{A})$	10 to 20	20 to 30	30 to 40	10 to 40	1 to 100

The above values do not include the current flowing through the $1\text{ k}\Omega$ resistance between the gate and cathode.

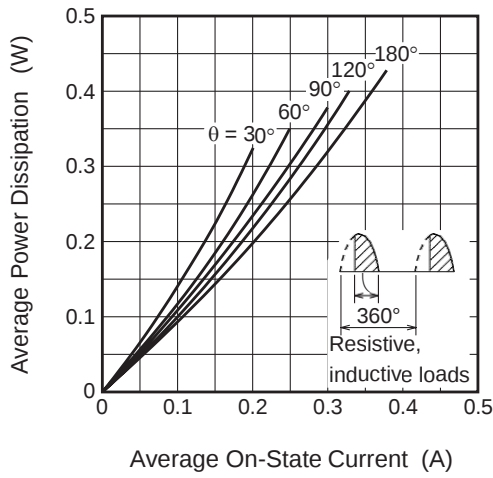
3 I_{GT} , V_{GT} measurement circuit.



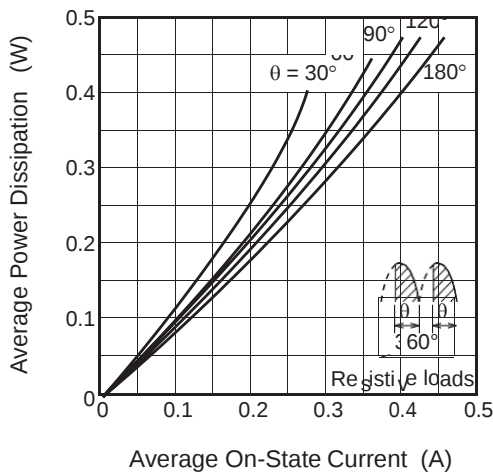
Switch 1 : I_{GT} measurement
 Switch 2 : V_{GT} measurement
 (Inner resistance of voltage meter is about $1\text{ k}\Omega$)

Performance Curves
Maximum On-State Characteristics

Rated Surge On-State Current

Gate Characteristics

Gate Trigger Current vs. Junction Temperature

Gate Trigger Voltage vs. Junction Temperature

Maximum Transient Thermal Impedance Characteristics (Junction to ambient)


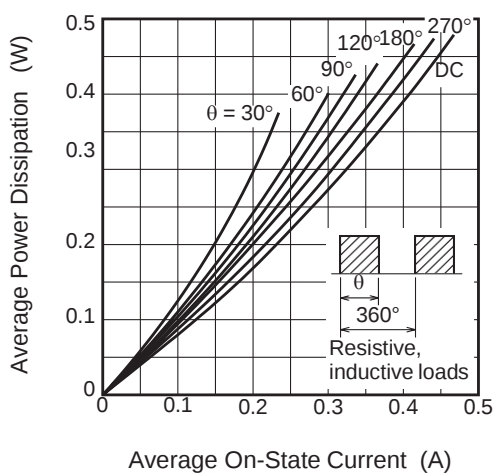
Maximum Average Power Dissipation
(Single-Phase Half Wave)



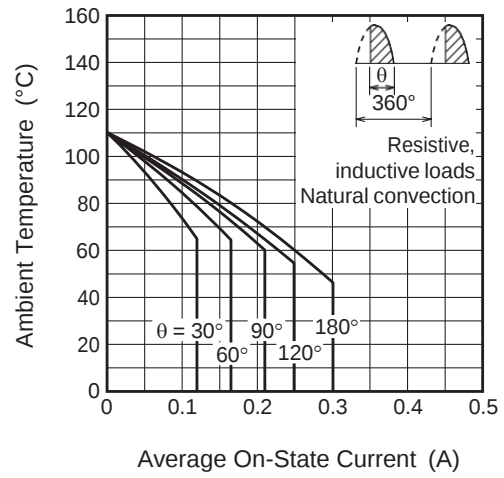
Maximum Average Power Dissipation
(Single-Phase Full Wave)



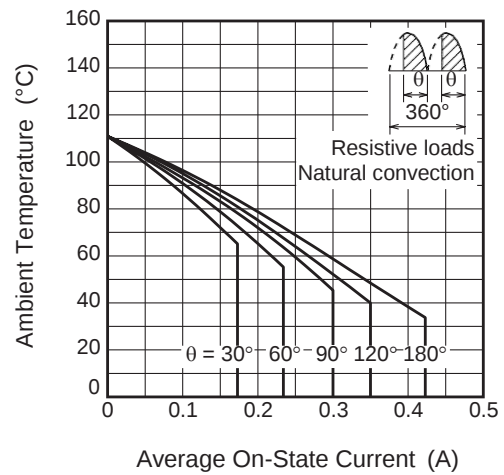
Maximum Average Power Dissipation
(Rectangular Wave)



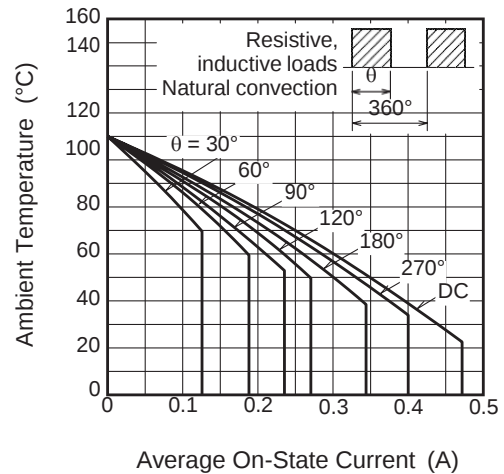
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)

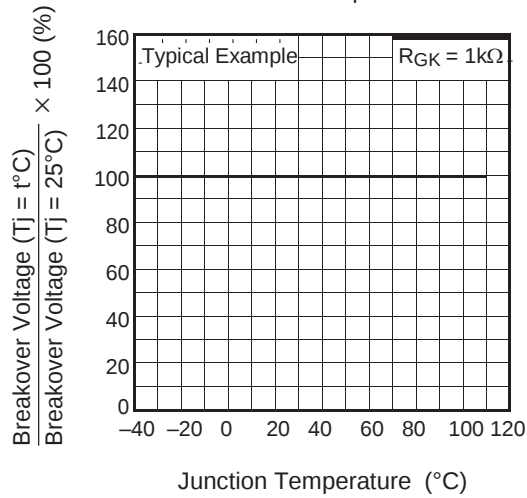


Allowable Ambient Temperature vs.
Average On-State Current
(Rectangular Wave)

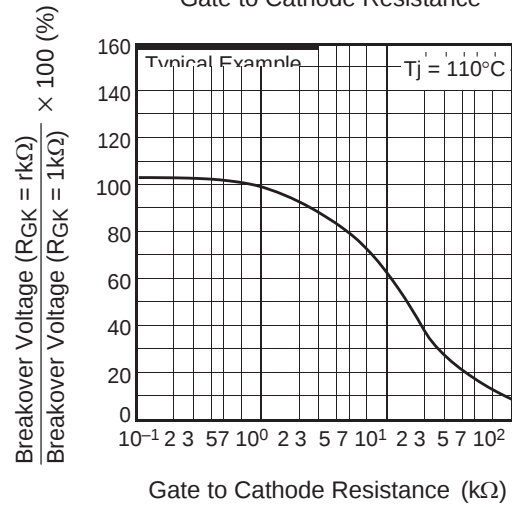




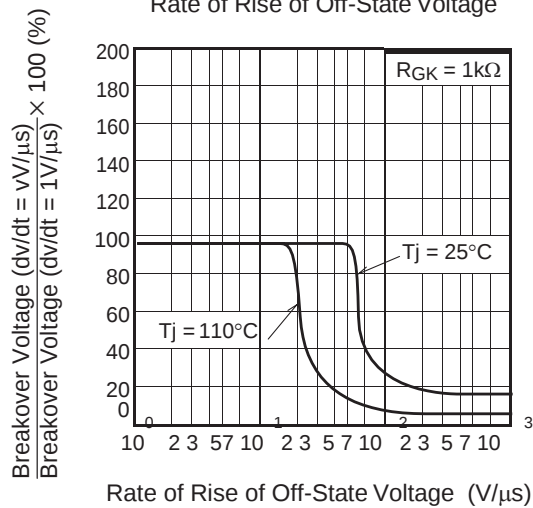
Breakover Voltage vs.
Junction Temperature



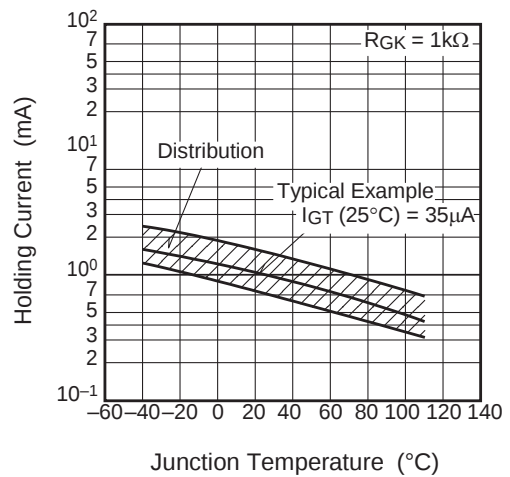
Breakover Voltage vs.
Gate to Cathode Resistance



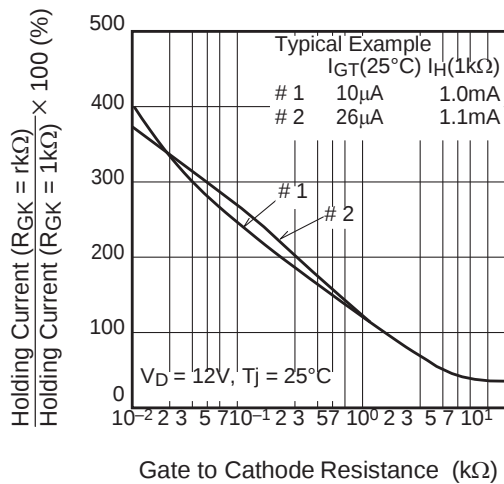
Breakover Voltage vs.
Rate of Rise of Off-State Voltage



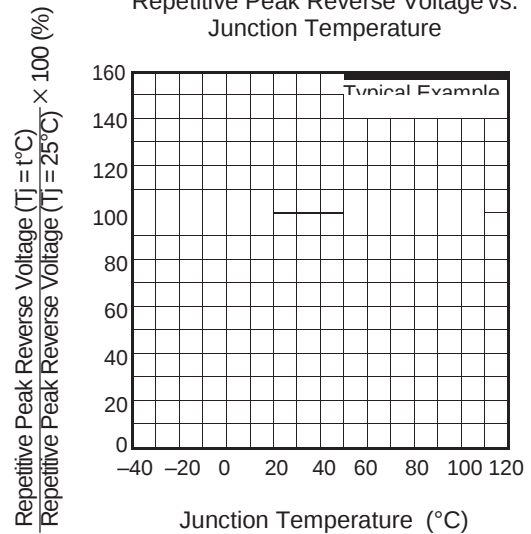
Holding Current vs.
Junction Temperature

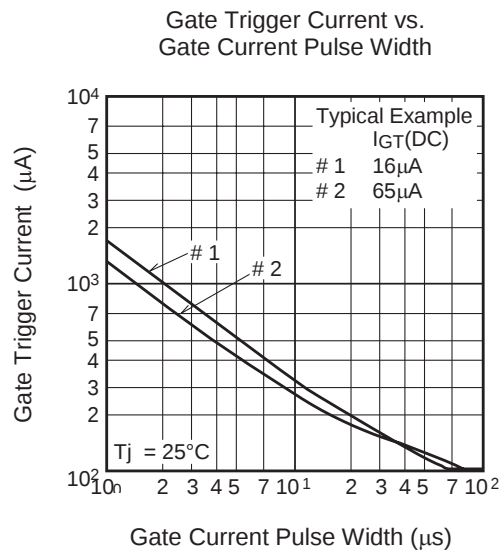


Holding Current vs.
Gate to Cathode Resistance

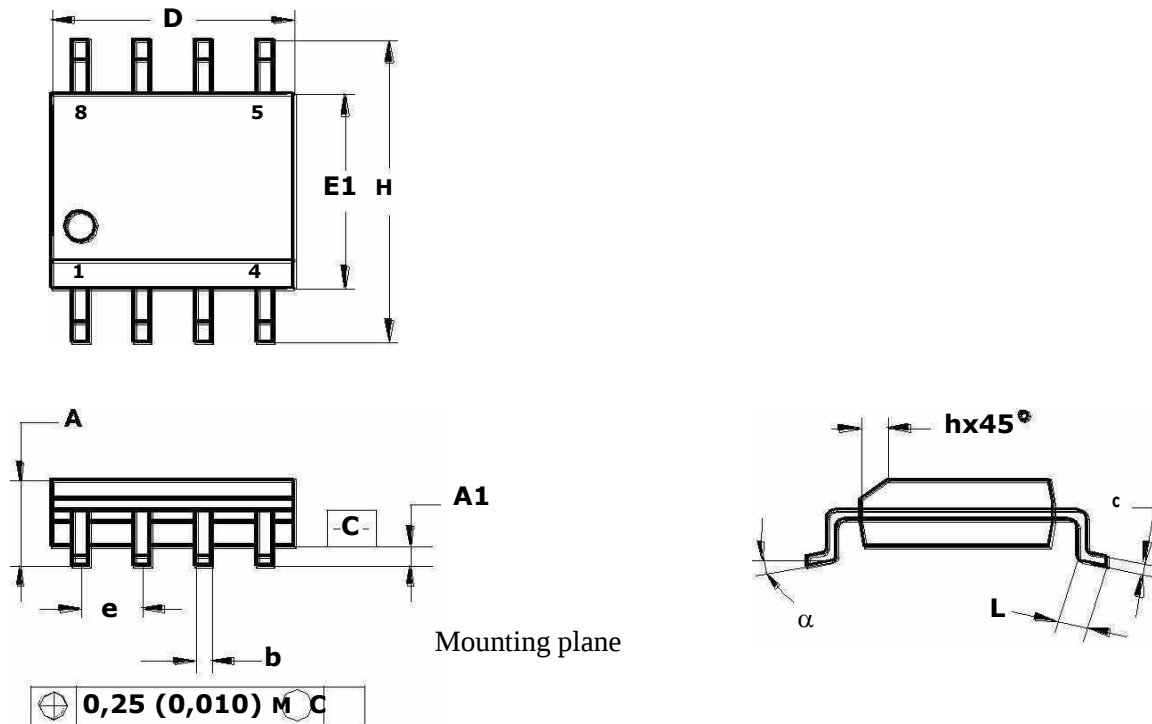


Repetitive Peak Reverse Voltage vs.
Junction Temperature





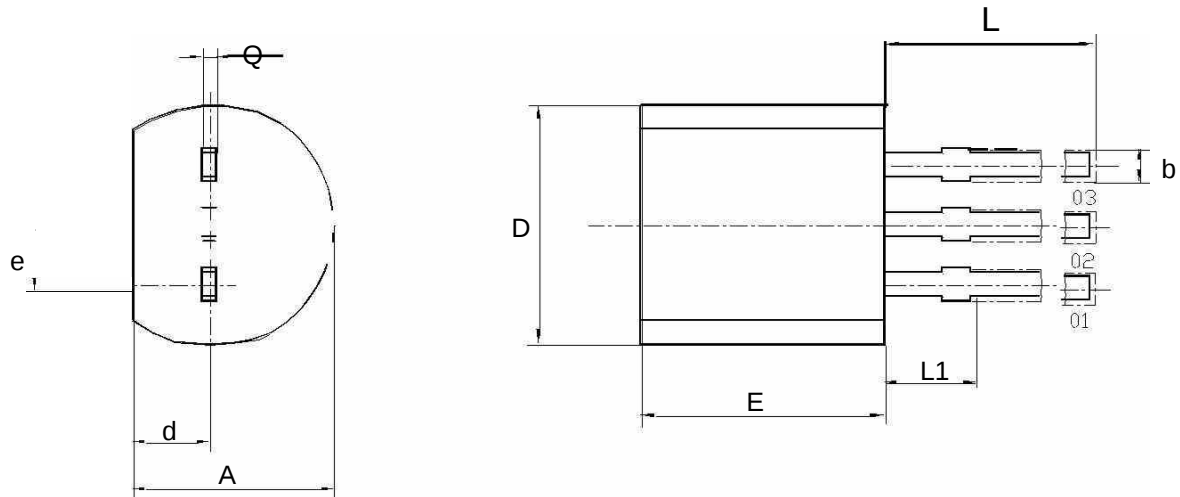
SOP8 150mil



Note – Dimensions D, E1 do not include the value of fin, which should not exceed 0,25 (0,010) per side.

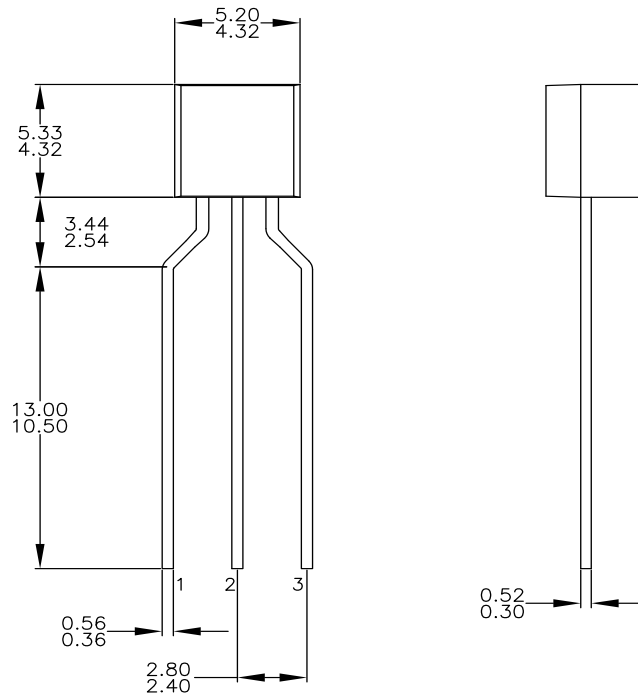
	D	E1	H	b	e	α	A	A1	c	L	h
Millimeters											
min	4.80	3.80	5.80	0.33		0°	1.35	0.10	0.19	0.41	0.25
max	5.00	4.00	6.20	0.51		1.27	8°	1.75	0.25	0.25	1.27
Inches											
min	0.1890	0.1497	0.2284	0.013		0°	0.0532	0.0040		0.016	0.0099
max	0.1968	0.1574	0.2440	0.020		0.100	8°	0.0688	0.0090		0.050

TO92



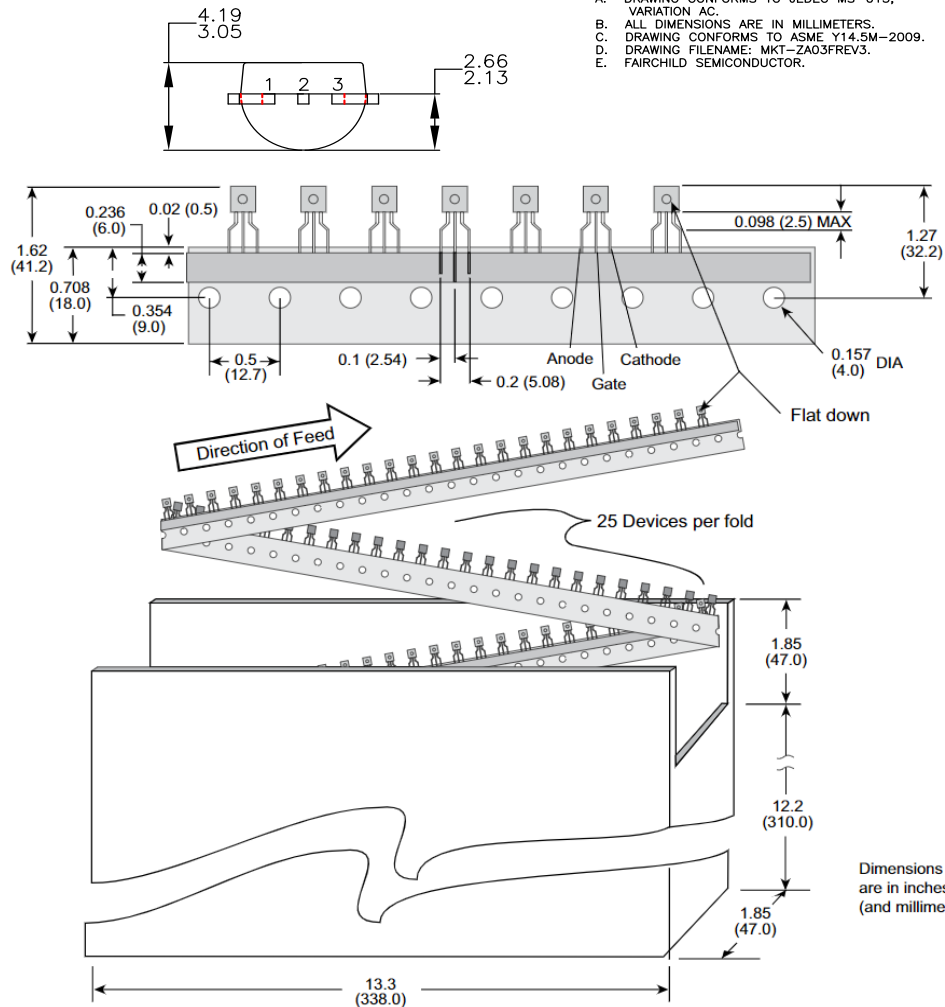
Dimensions	mm	
	min	max
E	4,6	5,1
b	-	0,5
D	4,6	5
d	1,25	1,65
A	3,5	3,8
e	1,2573	1,2827
L	12,5	14,5
L1	-	2
Q	-	0,5

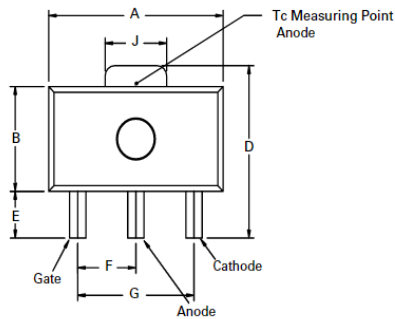
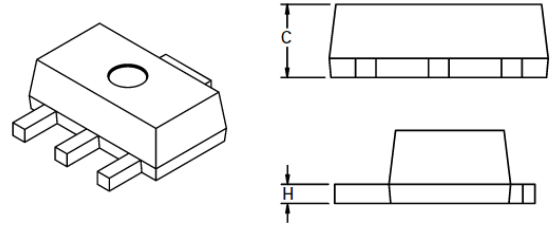
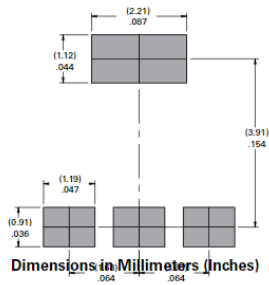
TO-92-3L



NOTES: UNLESS OTHERWISE SPECIFIED

- A. DRAWING CONFORMS TO JEDEC MS-013, VARIATION AC.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DRAWING CONFORMS TO ASME Y14.5M-2009.
- D. DRAWING FILENAME: MKT-ZA03FREV3.
- E. FAIRCHILD SEMICONDUCTOR.



SOP89-3L

Pad Layout for SOT-89


Dimension	Inches			Millimeters		
	Min	Typ	Max	Min	Typ	Max
A	0.173	—	0.181	4.40	—	4.60
B	0.090	—	0.102	2.29	—	2.60
C	0.055	—	0.063	1.40	—	1.60
D	0.155	—	0.167	3.94	—	4.25
E	0.035	—	0.047	0.89	—	1.20
F	0.056	—	0.062	1.42	—	1.57
G	0.115	—	0.121	2.92	—	3.07
H	0.014	—	0.017	0.35	—	0.44
I	0.014	—	0.019	0.36	—	0.48
J	0.064	—	0.072	1.62	—	1.83