3.6V 500mA/400mA+ Low Dropout Regulator

Features

- **Dropout voltage typically 0.9V @ I_O = 500mA**
- **Output current in excess of 500mA/400mA+**
- **Output voltage accuracy ±2%**
- **Quiescent current, typically 0.6mA**
- **Internal short circuit current limit**
- **Internal over temperature protection**

General Description

The G936 positive 3.6V voltage regulator features the ability to source 500mA/400mA+ of output current with a dropout voltage of typically 0.9V/0.65V. A low quiescent current is provided. The typical quiescent current is 0.6mA.

[+ *For SOT-89 package only*]

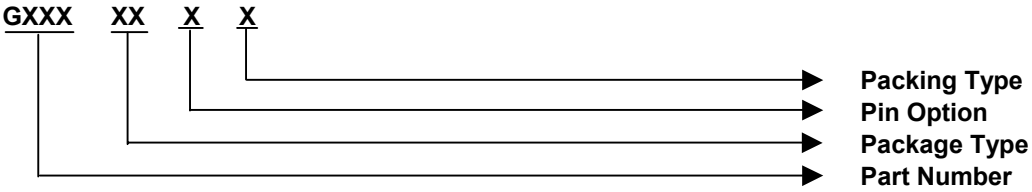
Familiar regulator features such as over temperature and over current protection circuits are provided to prevent it from being damaged by abnormal operating conditions.

Ordering Information

ORDER NUMBER	PACKAGE TYPE	PIN OPTION		
		1	2	3
G936T24U	SOT89	GND	V_{IN}	V_{OUT}
G936T65U	SOT223	V_{IN}	GND	V_{OUT}

* For other package types, pin options and package, please contact us at sales @gmt.com.tw

Order Number Identification



PACKAGE TYPE

T2 : SOT 89
T6 : SOT 223
T7 : SOT 23
T8 : µTO92

PIN OPTION

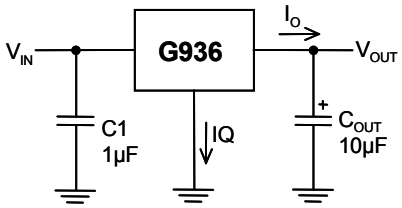
1	2	3
1 : V_{OUT}	GND	V_{IN}
2 : V_{OUT}	V_{IN}	GND
3 : GND	V_{OUT}	V_{IN}
4 : GND	V_{IN}	V_{OUT}
5 : V_{IN}	GND	V_{OUT}
6 : V_{IN}	V_{OUT}	GND

PACKING

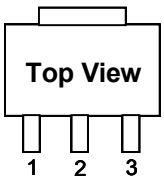
U & D : Tape & Reel Direction
T : Tube
B : Bag

Typical Application

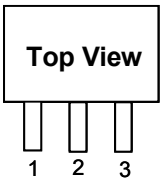
[Note 4] : Type of C_{OUT}



Package Type



SOT 89、223



µTO 92

SOT 23

Absolute Maximum Ratings (Note 1)

Input Voltage.....10V
Power Dissipation Internally Limited
(Note2)
Maximum Junction Temperature.....130°C
Storage Temperature Range.....-65°C ≤ T_J ≤+150°C
Lead Temperature, Time for Wave Soldering
SOT 89, SOT 223 Package.....260°C, 4s
Continuous Power Dissipation (T_A = + 25°C)
SOT 89[(1)].....0.42W
SOT 223[(1)].....0.65W

Note [(1)]: See Recommended Minimum Footprint.

Operating Conditions (Note 1)

Input Voltage.....4V ~ 7V
Temperature Range.....0°C ≤ T_J ≤125°C

Electrical Characteristics

V_{IN} = 5V, I_O = 500mA/400mA+, C_{IN}=1µF, C_{OUT} =10µF. All specifications apply for T_A = T_J = 25°C. [Note 3]

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
Output Voltage	10mA ≤ I_O ≤500mA		3.528	3.6	3.672	V
	10mA ≤ I_O ≤400mA+					
Line Regulation	4V ≤ V_{IN} ≤ 7V, I_O = 50mA			5		mV
Load Regulation	10mA ≤ I_O ≤500mA			58		mV
	10mA ≤ I_O ≤400mA+			50		
Output Impedance	200mA DC and 100mA AC, f_O = 120Hz			140		mΩ
Quiescent Current	V_{IN} = 5V			0.6		mA
Ripple Rejection	f_i = 120 Hz, 1V_{P-P}, Io = 100mA			42		dB
Dropout Voltage	I_O = 500mA			0.9		V
	I_O =400mA+			0.65		
	I_O = 50mA			80		mV
Output Current	Continuous Test T_A = 25°C, T_J < 125°C, V_{OUT} within ±2% (Note 2)	V_{IN} = 5.1V, Mounted on SOT 223 Recommended Minimum Footprint		400		mA
		V_{IN} = 4.8V, Mounted on SOT 89 Recommend Minimum Footprint		300+		
Short Circuit Current				0.77		A
Over Temperature				125		°C

[+ *for SOT-89 Package only*]

Note 1: Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating Conditions are conditions under which the device functions but the specifications might not be guaranteed. For guaranteed specifications and test conditions see the Electrical Characteristics.

Note2: The maximum power dissipation is a function of the maximum junction temperature, T_{Jmax}; total thermal resistance, θ_{JA}, and ambient temperature T_A. The maximum allowable power dissipation at any ambient temperature is T_{jmax}-T_A / θ_{JA}. If this dissipation is exceeded, the die temperature will rise above 130°C and the G936 will go into thermal shutdown. For the G936 in SOT 89 package, θ_{JA} is 250°C/W and in the SOT223 package is 156°C/W (See Recommend Minimum Footprint). The safe operation in SOT 89 & SOT 223 package of G936, it can see "Typical Performance Characteristics" (Safe Operating Area).

Note3: Low duty pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

Note4: The type of output capacitor should be tantalum or aluminum.

Definitions

Dropout Voltage

The input/output Voltage differential at which the regulator output no longer maintains regulation against further reductions in input voltage. Measured when the output drops 100mV below its nominal value, dropout voltage is affected by junction temperature, load current and minimum input supply requirements.

Line Regulation

The change in output voltage for a change in input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

Load Regulation

The change in output voltage for a change in load current at constant chip temperature. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

Maximum Power Dissipation

The maximum total device dissipation for which the regulator will operate within specifications.

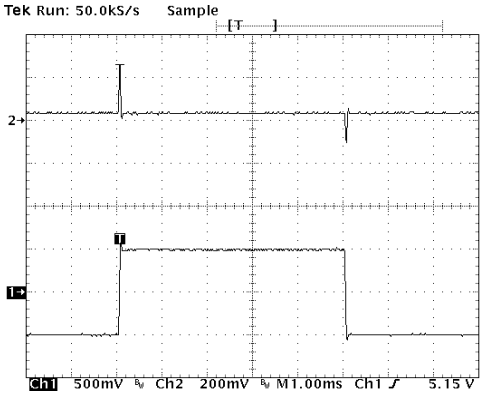
Quiescent Bias Current

Current which is used to operate the regulator chip and is not delivered to the load.

Typical Performance Characteristics

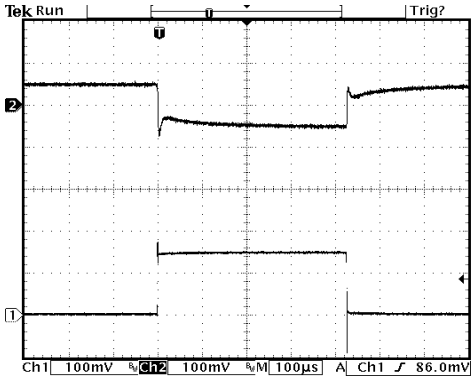
(V_{IN}=5V , C_{IN}=1µF, C_{OUT} =10µF, T_A=25°C , unless otherwise noted.)

Line Transient



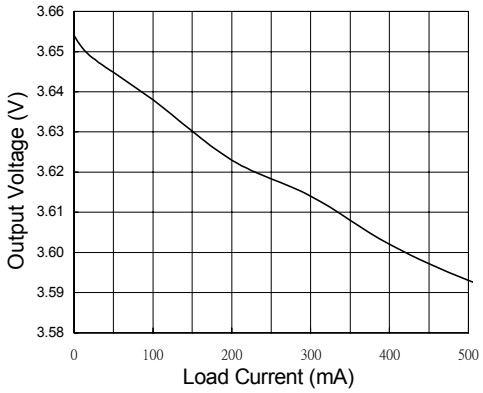
Ch1: Vin (offset=5.00V)
Ch2: Vout (offset=3.600V)
Iout=100mA

Load Transient

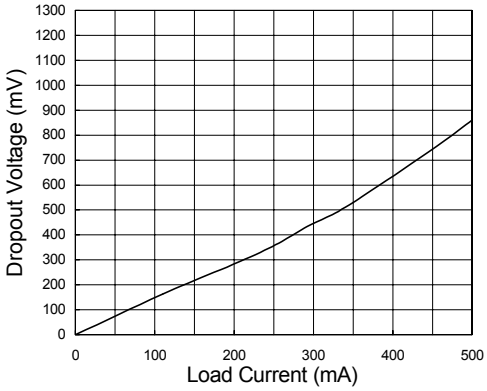


Ch1: Iout (400mA/div)
Ch2: Vout (offset=3.600V)

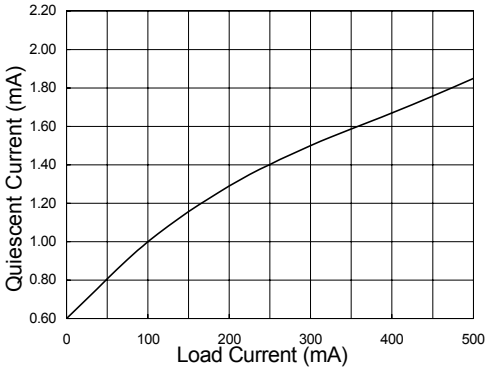
Output Voltage vs. Load Current



Dropout Voltage vs. Load Current



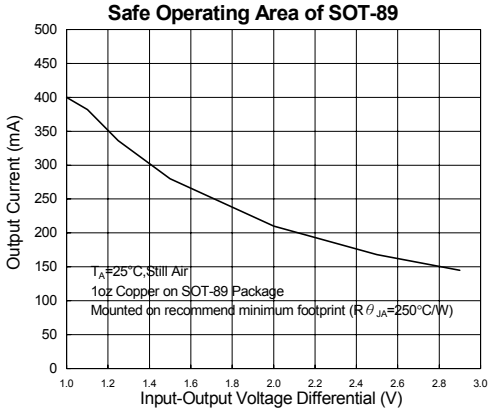
Ground Current vs. Load Current



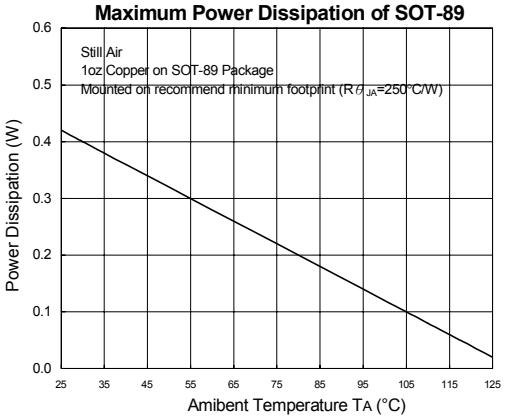
Typical Performance Characteristics

(V_{IN}=5V, C_{IN}=1µF, C_{OUT} =10µF, T_A=25°C, unless otherwise noted.)

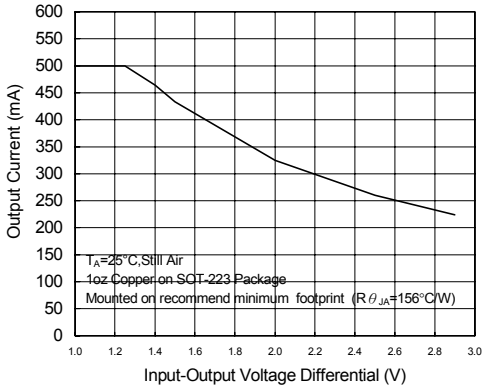
Safe Operating Area of SOT-89



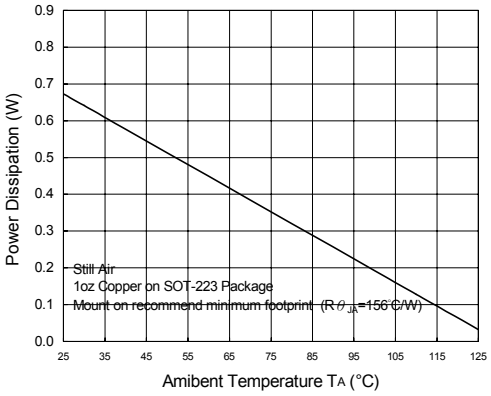
Maximum Power Dissipation of SOT-89



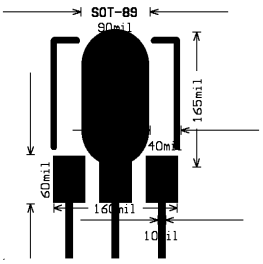
Safe Operating Area of SOT-223

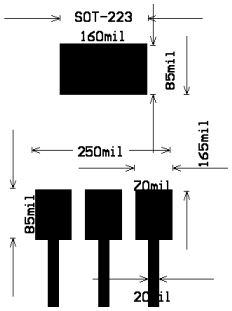


Maximum Power Dissipation of SOT-223

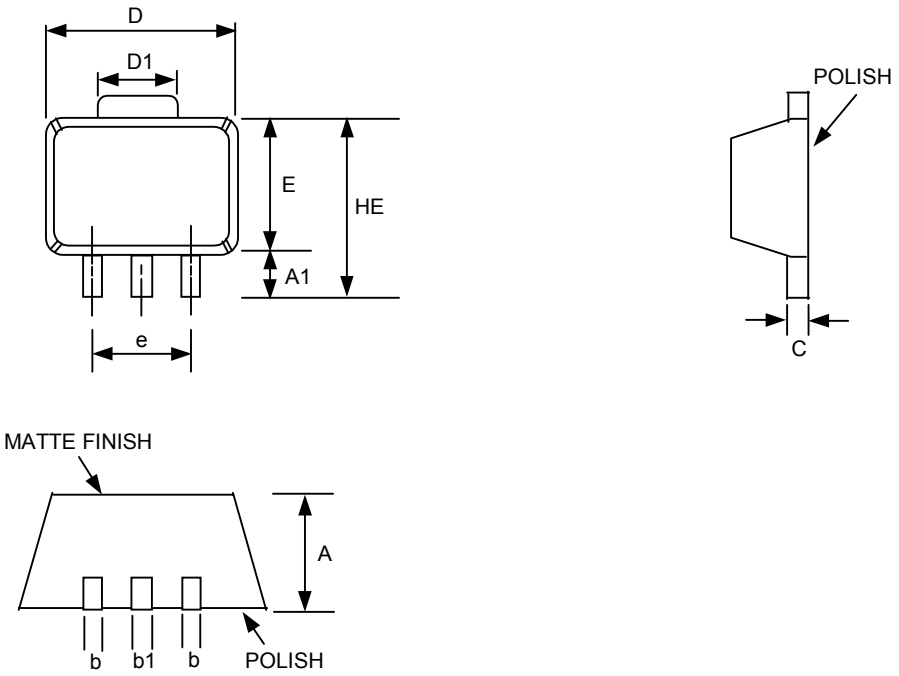


Recommend Minimum Footprint



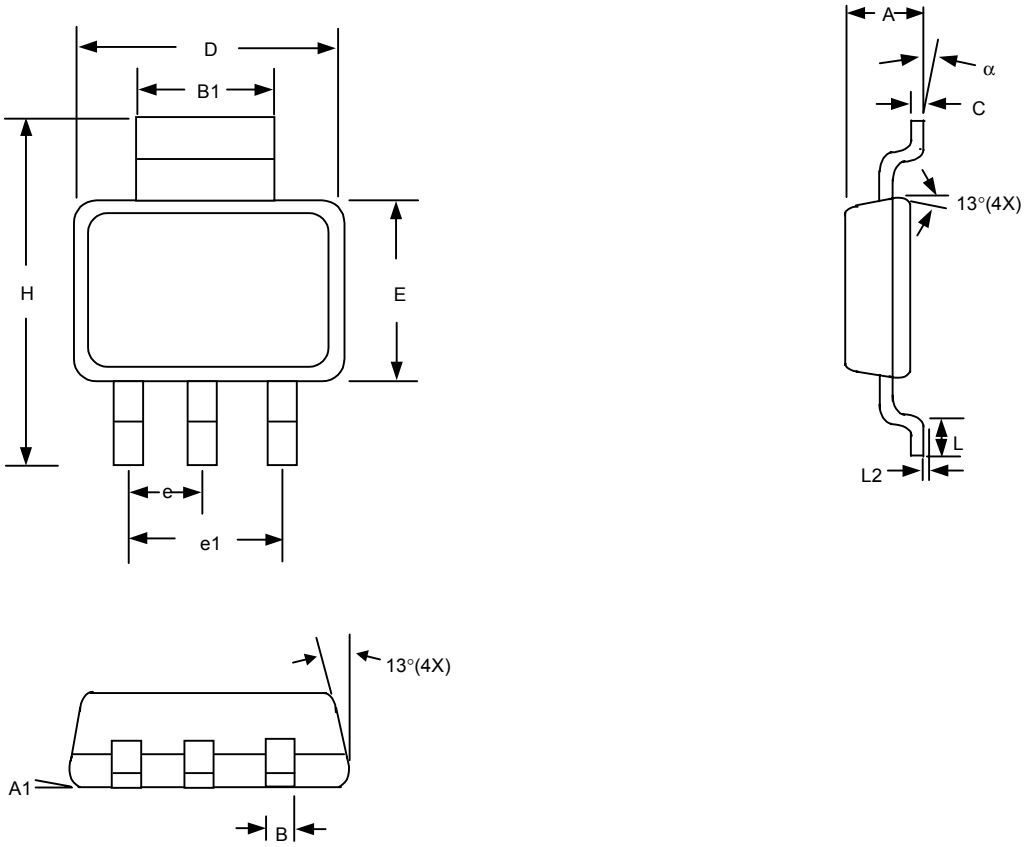


Package Information



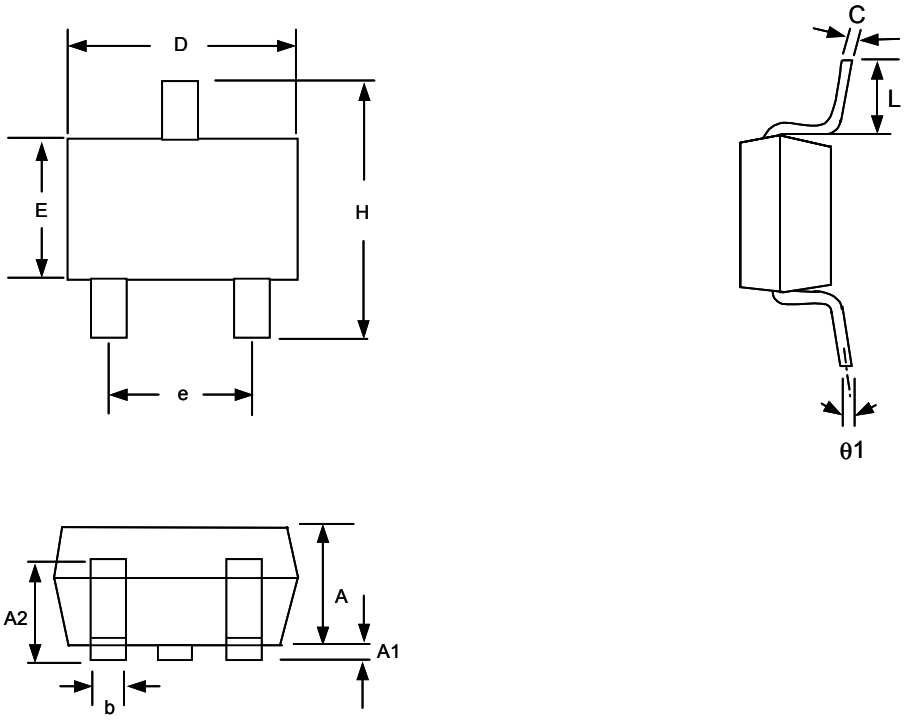
SOT 89 (T2) Package

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.40	1.50	1.60	0.055	0.059	0.063
A1	0.80	1.04	-----	0.031	0.041	-----
b	0.36	0.42	0.48	0.014	0.016	0.048
b1	0.41	0.47	0.53	0.016	0.018	0.020
C	038	0.40	0.43	0.014	0.015	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.40	1.60	1.75	0.055	0.062	0.069
HE	-----	-----	4.25	-----	-----	0.167
E	2.40	2.50	2.60	0.094	0.098	0.102
e	2.90	3.00	3.10	0.114	0.118	0.122



SOT 223 (T6) Package

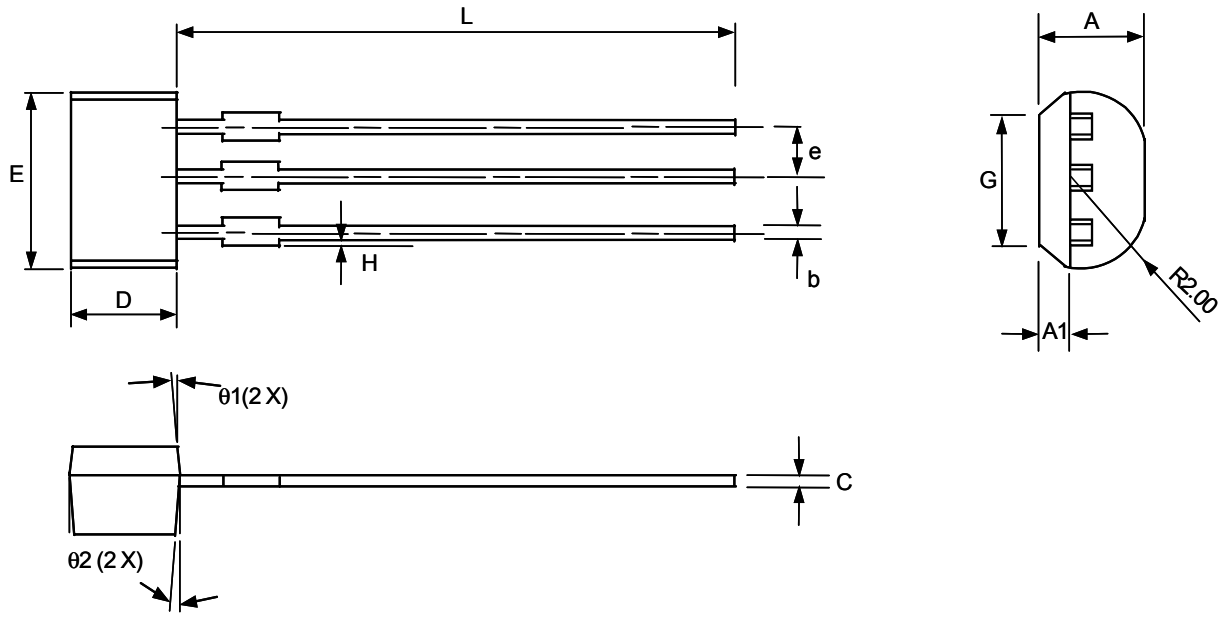
SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.55	1.80	0.061	0.071
A1	0.02	0.12	0.0008	0.0047
B	0.60	0.80	0.024	0.031
B1	2.90	3.10	0.114	0.122
C	0.24	0.32	0.009	0.013
D	6.30	6.70	0.248	0.264
E	3.30	3.70	0.130	0.146
e	2.30 BSC		0.090 BSC	
e1	4.60 BSC		0.181 BSC	
H	6.70	7.30	0.264	0.287
L	0.90 MIN		0.036 MIN	
L2	0.06 BSC		0.0024 BSC	
α	0°	10°	0°	10°



SOT-23 (T7) Package

Note:
1.Package body sizes exclude mold flash protrusions or gate burrs
2.Tolerance ±0.1000 mm (4mil) unless otherwise specified
3.Coplanarity: 0.1000mm
4.Dimension L is measured in gage plane

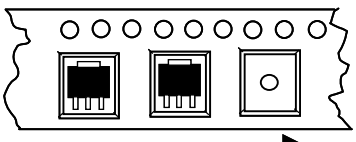
SYMBOLS	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	1.00	1.10	1.30
A1	0.00	-----	0.10
A2	0.70	0.80	0.90
b	0.35	0.40	0.50
C	0.10	0.15	0.25
D	2.70	2.90	3.10
E	1.40	1.60	1.80
e	-----	1.90(TYP)	-----
H	2.60	2.80	3.00
L	0.37	------	-----
θ 1	1°	5°	9°



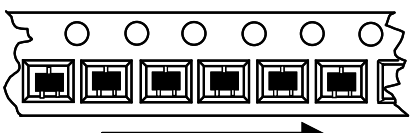
µTO-92 (T8) Package

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.40	2.50	2.60	0.094	0.098	0.102
A1	0.70	0.80	0.90	0.028	0.032	0.036
b	0.35	0.45	0.55	0.014	0.018	0.022
C	-----	0.40	-----	-----	0.016	-----
D	2.80	3.00	3.20	0.110	0.118	0.126
E	3.80	4.00	4.20	0.149	0.157	0.165
e	-----	1.27	-----	-----	0.050	-----
F	1.91	2.11	2.31	0.075	0.083	0.091
G	3.35	3.55	3.75	0.132	0.140	0.148
H	0.00	-----	0.15	0.000	-----	0.006
L	13.80	14.00	14.20	0.543	0.551	0.559
θ 1	-----	2°	-----	-----	2°	-----
θ 2	-----	5°	-----	-----	5°	-----

Package Orientation



Feed Direction
SOT 89、223 Package Orientation



Feed Direction
SOT 23 Package Orientation