G910/G911

3.3V 600mA/250mA+ Low Dropout Regulator

Features

- **Dropout voltage typically 0.65V/0.25V @ I_O = 600mA/ 250mA+**
- **Output current in excess of 600mA/250mA+**
- **Output voltage accuracy ±2%**
- **Quiescent current, typically 0.3mA**
- **Internal short circuit current limit**
- **Internal over temperature protection**

General Description

The G910/G911 positive 3.3V voltage regulator features the ability to source 600mA/250mA+ of output current with a dropout voltage of typically 0.65V/ 0.25V. A low quiescent current is provided. The typical quiescent current is 0.3mA.

[+ *For μTO-92 & TO-92 package*]

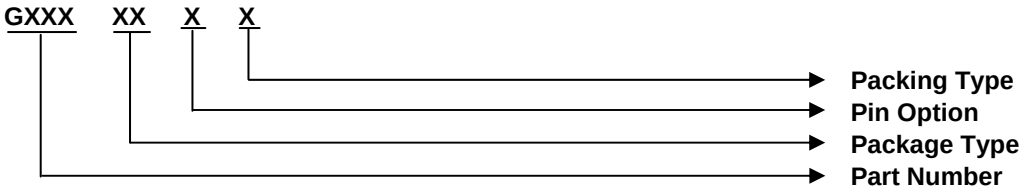
Familiar regulator features such as over temperature and over current protection circuits are provided to prevent it from being damaged by abnormal operating conditions.

Ordering Information

ORDER NUMBER	ORDER NUMBER (Pb free)	TEMP. RANGE	PACKAGE	PIN OPTION		
				1	2	3
G910T21U	G910T21Uf	-40°C~85°C	SOT-89	V_{OUT}	GND	V_{IN}
G911T24U	G911T24Uf	-40°C~85°C	SOT-89	GND	V_{IN}	V_{OUT}
G910T65U	G910T65Uf	-40°C~85°C	SOT-223	V_{IN}	GND	V_{OUT}
G910TD1B	G910TD1Bf	-40°C~85°C	TO-92	V_{OUT}	GND	V_{IN}
G911TD4B	G911TD4Bf	-40°C~85°C	TO-92	GND	V_{IN}	V_{OUT}
G910T81B	G910T81Bf	-40°C~85°C	μTO-92	V_{OUT}	GND	V_{IN}
G911T84B	G911T84Bf	-40°C~85°C	μTO-92	GND	V_{IN}	V_{OUT}
G911T85B	G911T85Bf	-40°C~85°C	μTO-92	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
T8 : μTO-92
TD :TO-92

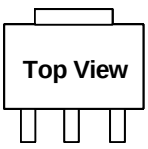
PIN OPTION

	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

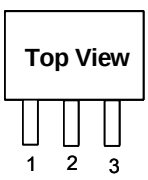
PACKING

U & D : Tape & Reel Direction
B : Bag

Package Type



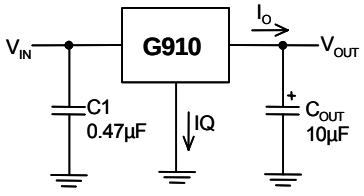
SOT-89、223



μTO-92 、 TO-92

Typical Application

[Note 4]: Type of C_{OUT}



Absolute Maximum Ratings (Note 1)

Input Voltage. 7V
Power Dissipation Internally Limited (Note2)
Maximum Junction Temperature . . . . . .150°C
Storage Temperature Range. . . . . -65°C ≤ T_J ≤+150°C
Reflow Temperature (soldering, 10sec) . . . . . .260°C
Thermal Resistance Junction to Ambient, (θ_{JA})
SOT-89. . . . . 173°C/W(1)
SOT-223. . . . . 148°C/W(1)
µTO-92, TO-92 . . . . . .159°C/W(1)
Thermal Resistance Junction to Case, (θ_{Jc})
SOT-89. . . . . ..25°C/W
SOT-223 . . . . . 22°C/W

Operating Conditions (Note 1)

Input Voltage. . . . . 4V ~ 6.5V
Temperature Range . . . . . .-40°C ≤ T_A ≤85°C

Note (1): See Recommended Minimum Footprint.

Electrical Characteristics

V_{IN} =5V, I_O = 600mA/250mA+, C_{IN}=10µF, C_{OUT} =10µF. All specifications apply for T_A = T_J = 25°C.[Note 3]

PARAMETER	CONDITION		MIN	TYP	MAX	UNIT
Output Voltage	10mA ≤ I_O ≤600mA		3.234	3.3	3.366	V
	10mA ≤ I_O ≤250mA+					
Line Regulation	4V ≤ V_{IN} ≤ 6V, I_O = 10mA		---	15	---	mV
Load Regulation	10mA ≤ I_O ≤ 600mA		---	20	---	mV
	10mA ≤ I_O ≤ 250mA+		---	10	---	
Quiescent Current	V_{IN} = 5V		---	0.3	---	mA
Ripple Rejection	f_i = 120 Hz, 1V_{P-P}, Io = 100mA		---	47	---	dB
Dropout Voltage	I_O = 600mA		---	0.65	---	V
	I_O = 250mA+		---	0.25	---	
Output Current	Continuous Test T_A = 25°C, T_J < 125°C, V_{OUT} within ±2% (Note 2)	V_{IN} = 4.5V, mounted on SOT-89 recommended minimum footprint	---	600	---	mA
		V_{IN} = 5.2V, µTO-92 & TO-92 package 0.53 inch leads soldered to PC Board	---	250+	---	
Short Circuit Current			---	0.65	---	A
Current Limit				0.8		A
Over Temperature			---	145	---	°C

[+ *for µTO-92 & TO-92 Package*]

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 150°C and IC will go into thermal shutdown. For the G910 in µTO-92, TO-92, θ_{JA} is 159°C/W ;in the SOT-223 package is 148°C/W and SOT-89 package is 173°C/W (See Recommended Minimum Footprint). The safe operation in TO-92 & µTO-92 package, 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.

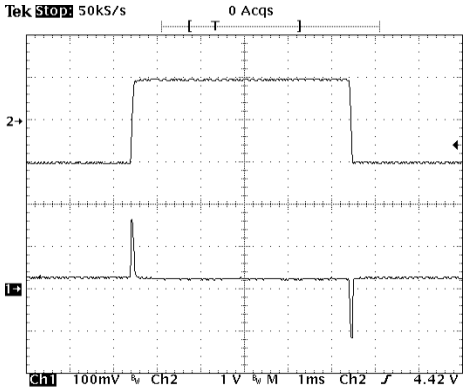
Quiescent Bias Current

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

Typical Performance Characteristics

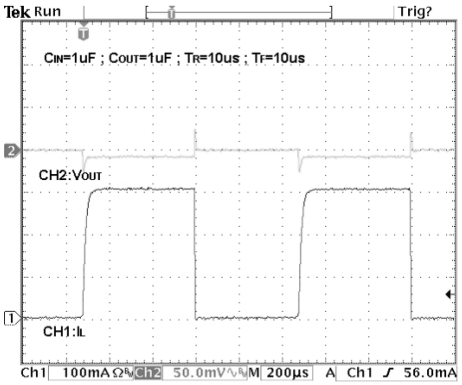
V_{IN}=5V, C_{IN}=1µF, C_{OUT} =10µF, T_A=25°C, unless otherwise noted.)

Line Transient

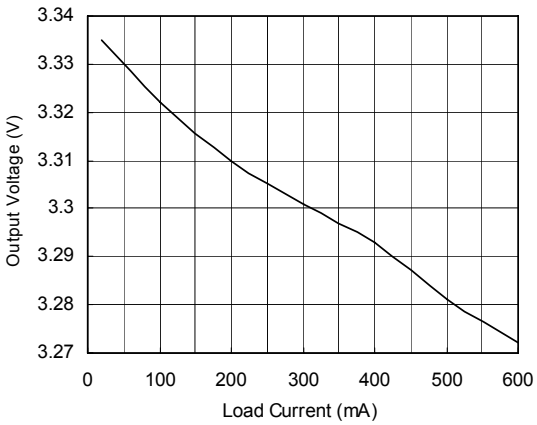


Ch1: Vout (offset=3.30V)
Ch2: Vin (offset=5.0V)
I_{OUT}=100mA

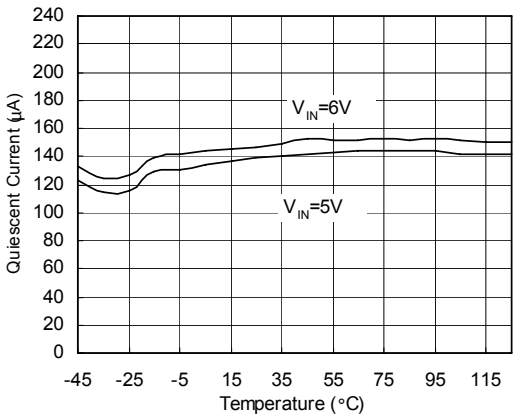
Load Transient



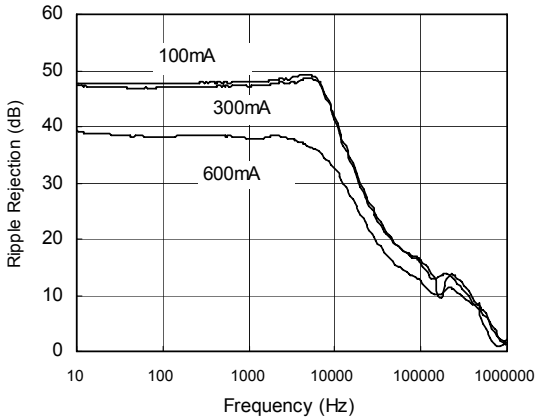
Output Voltage vs. Load Current



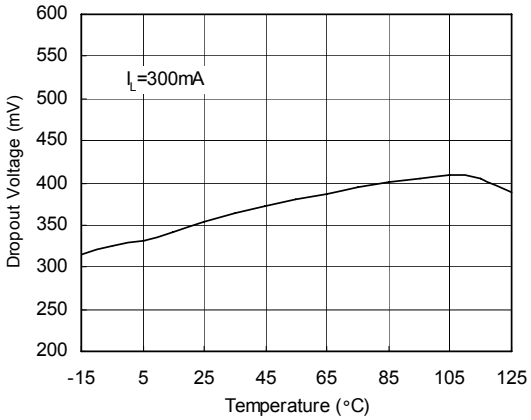
Quiescent Current vs. Temperature



Ripple Rejection vs. Frequency

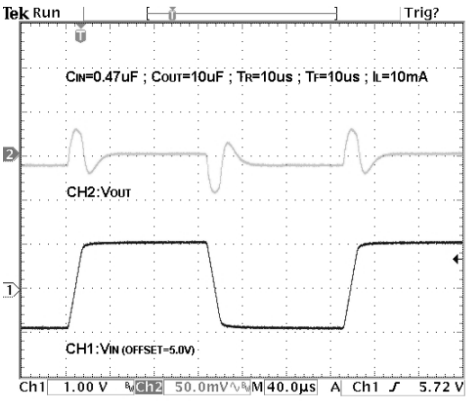


Dropout Volatge vs. Temperature

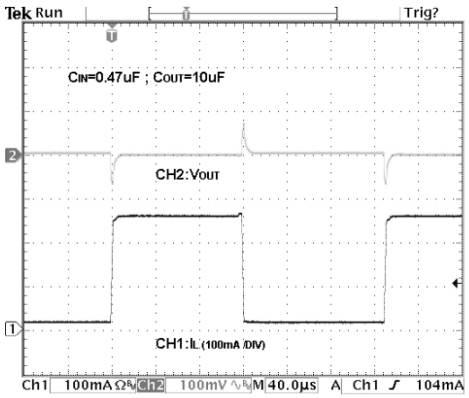


Typical Performance Characteristics (continued)

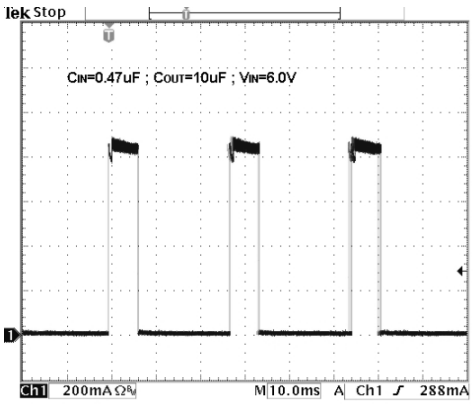
Line Transient (SOT-89)



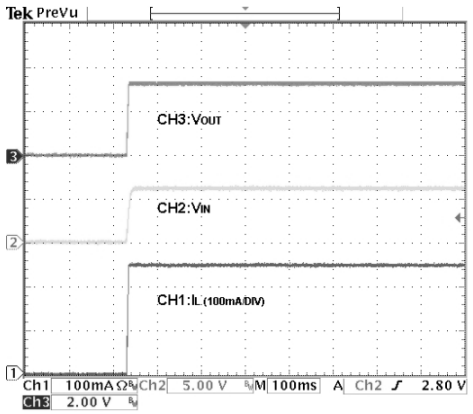
Load Transient (SOT-89)



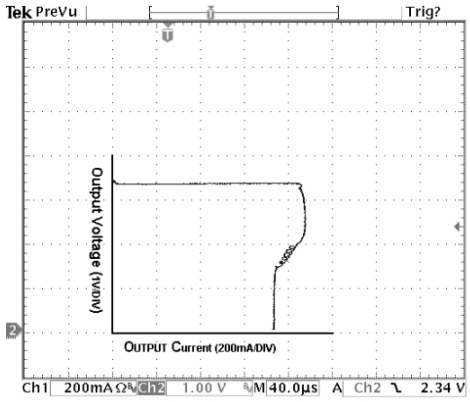
Short Circuit Current (SOT-89)



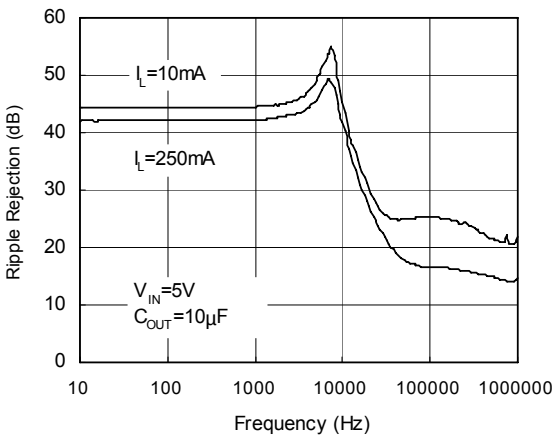
Start-UP (SOT-89)



Overcurrent Protection Characteristics (SOT-89)

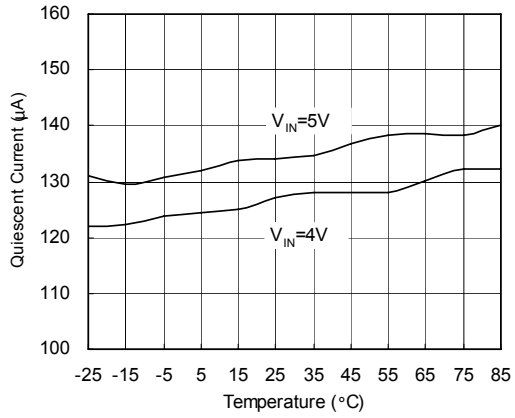


Ripple Rejection (SOT-89)

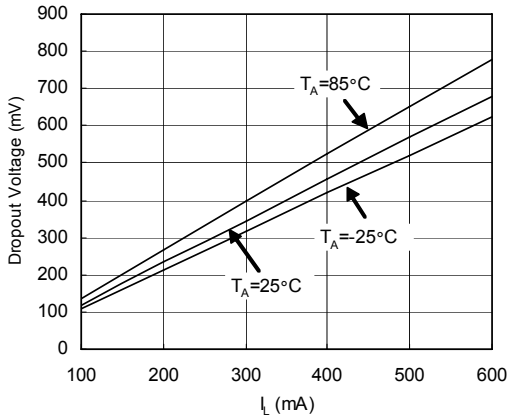


Typical Performance Characteristics (continued)

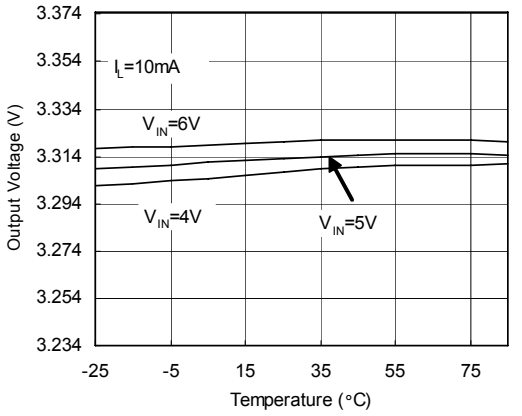
Quiescent Current vs. Temperature (SOT-89)



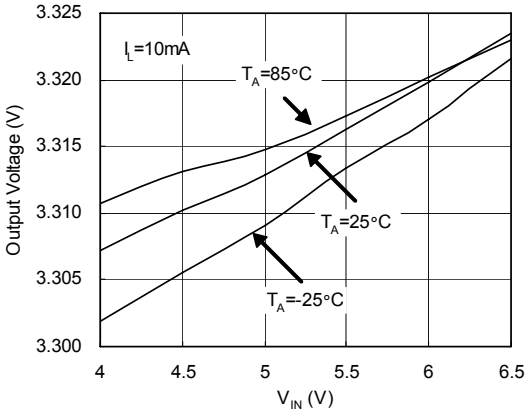
Dropout Voltage vs. I_L (SOT-89)



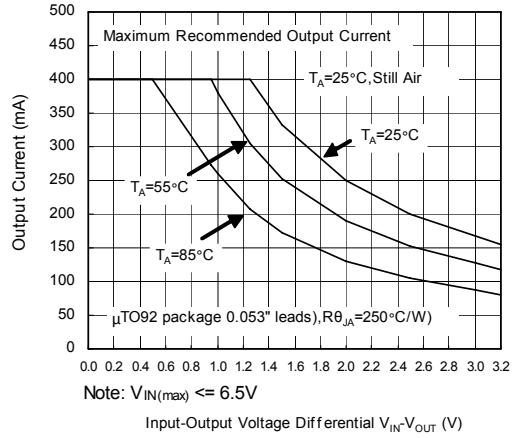
Output Voltage vs. Temperature (SOT-89)



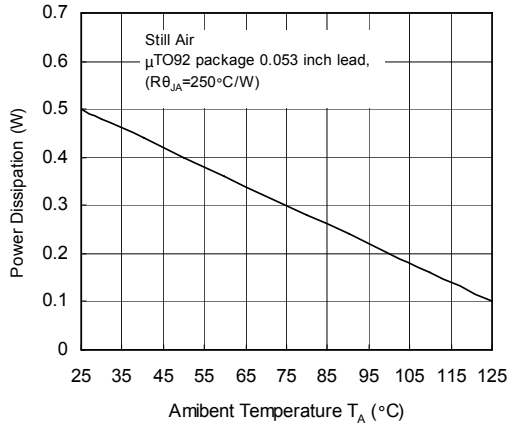
Output Voltage vs. V_{IN} (SOT-89)



Safe Operating Area of μTO-92 & TO-92

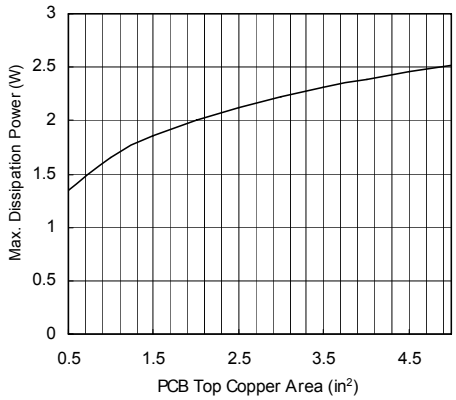


Maximum Power Dissipation of μTO-92 & TO-92

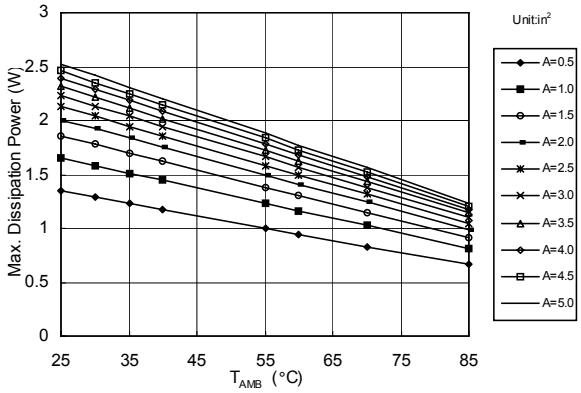


Typical Performance Characteristics (continued)

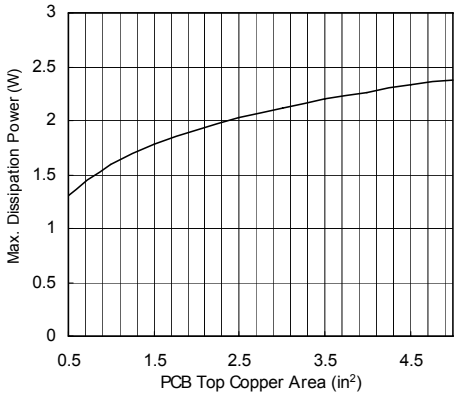
SOT-223 Max. Power Dissipation vs. PCB Top Copper Area T_{AMB} = 25°C ; Still Air



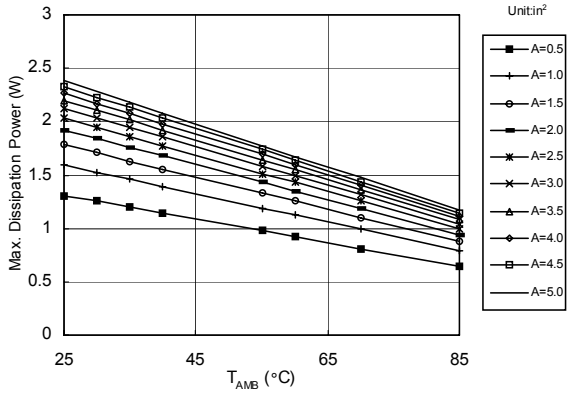
SOT-223 Max. Power Dissipation vs. T_{AMB} (still air) (Different PCB Top Copper Area)



SOT-89 Max. Power Dissipation vs. PCB Top Copper Area T_{AMB} = 25°C ; Still Air

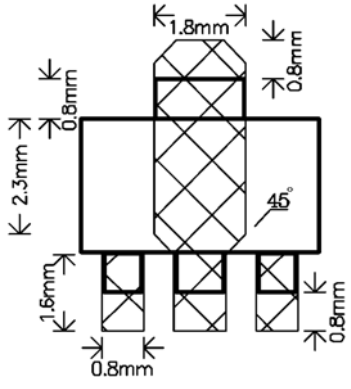


SOT-89 Max. Power Dissipation vs. T_{AMB} (still air) (Different PCB Top Copper Area)

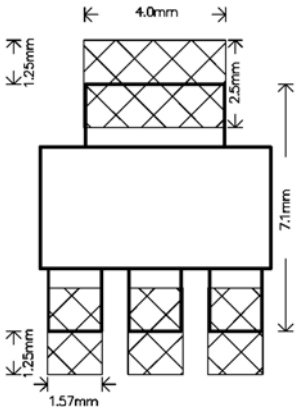


Recommended Minimum Footprint

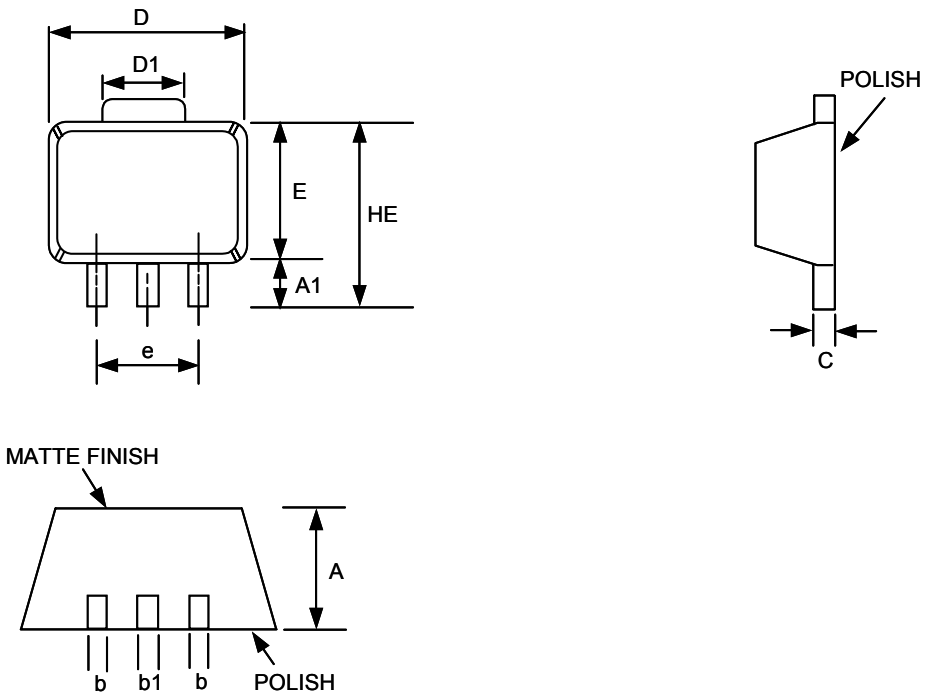
SOT-89



SOT-223

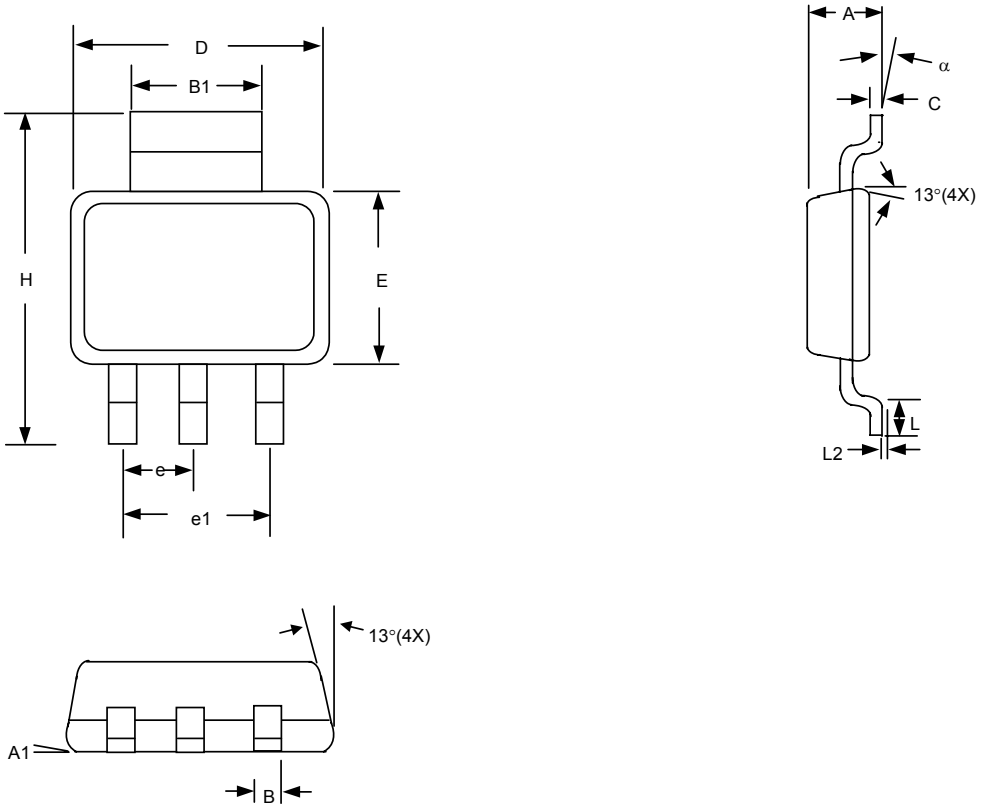


Package Information



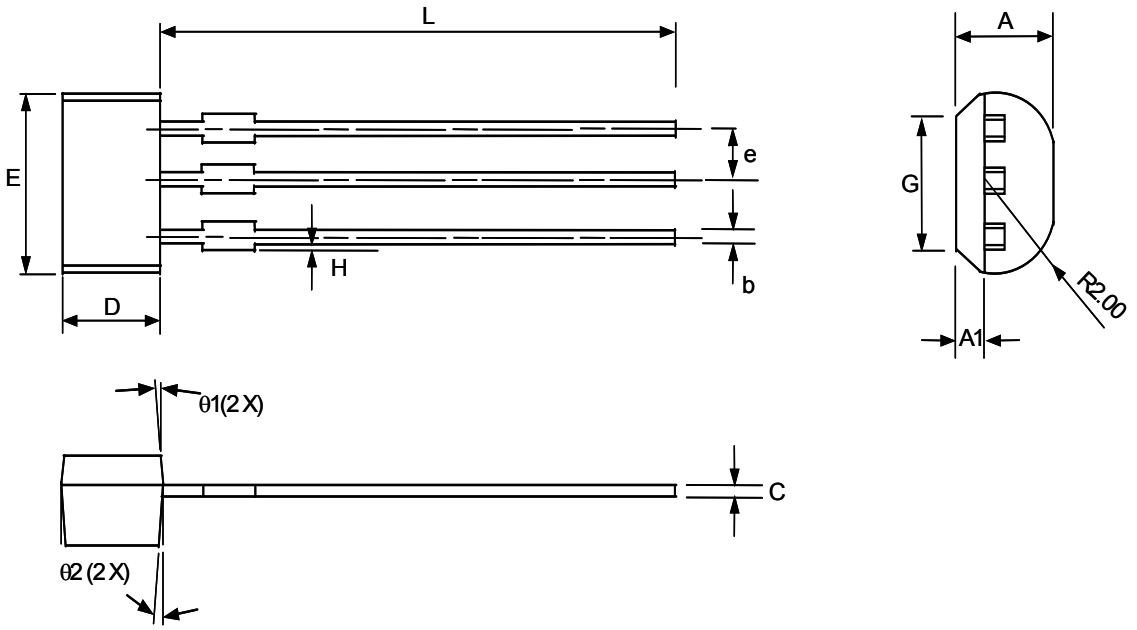
SOT-89 (T2) Package

SYMBOL	DIMENSIONS IN MILLIMETER			DIMENSIONS IN INCH		
	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	0.018
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



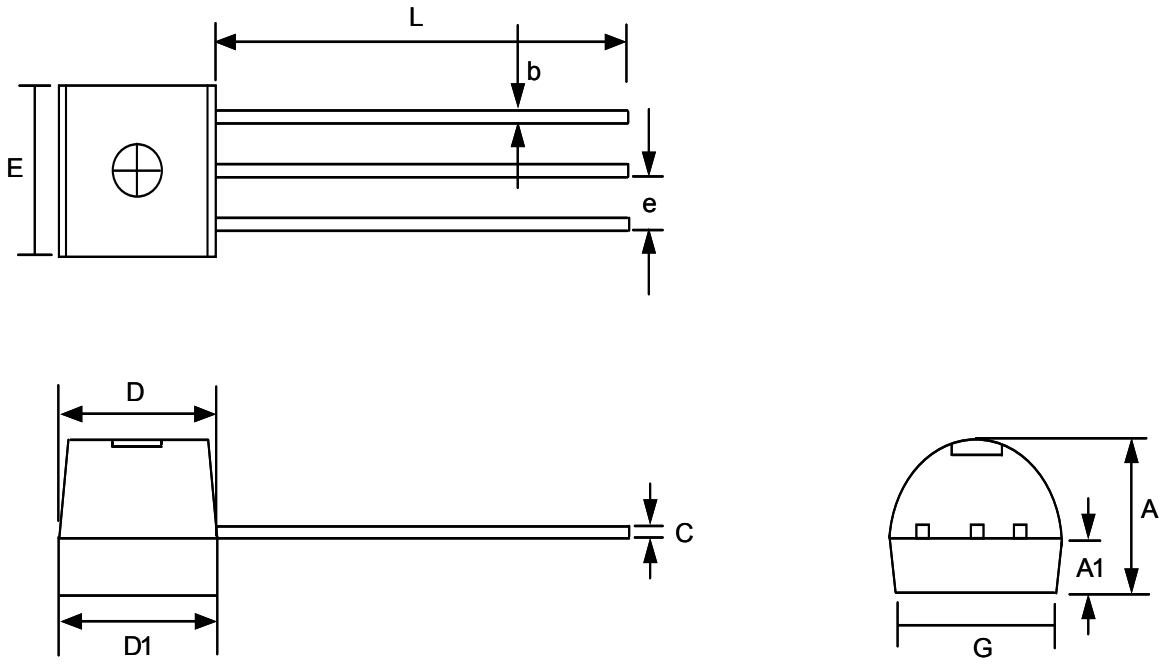
SOT-223 (T6) Package

SYMBOL	MILLIMETER		INCH	
	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°



µTO-92 (T8) Package

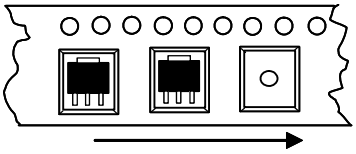
SYMBOL	DIMENSIONS IN MILLIMETER			DIMENSIONS IN INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.40	2.50	2.60	0.094	0.098	0.102
A1	0.70	0.80	0.90	0.028	0.032	0.036
b	0.35	0.45	0.55	0.014	0.018	0.022
C	-----	0.40	-----	-----	0.016	-----
D	2.80	3.00	3.20	0.110	0.118	0.126
E	3.80	4.00	4.20	0.149	0.157	0.165
e	-----	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°	-----



TO-92 (TD) Package

SYMBOL	MILLIMETER		INCH	
	MIN	MAX	MIN	MAX
A	3.35	3.86	0.132	0.152
A1	1.0414	1.55	0.041	0.061
b	0.254	0.508	0.010	0.020
E	4.34	4.85	0.171	0.191
C	0.254	0.508	0.010	0.020
L	14.53	15.04	0.572	0.592
e	1.143	1.397	0.045	0.055
G	3.683	4.191	0.145	0.165
D	4.29	4.80	0.169	0.189
D1	4.34	4.85	0.171	0.191

Taping Specification



Feed Direction
SOT-89、223 Package Orientation

PACKAGE	Q'TY/BY REEL	Q'TY/BY BAG
SOT-89	1,000 ea	-----
SOT-223	2,500 ea	-----
TO-92	-----	2,000 ea
µTO-92	-----	2,000 ea