CHENMKO ENTERPRISE CO.,LTD

Halogens free devices

1A Low Dropout Voltage Regulator

CHC1117-XXPAGP

SERIES

■ FEATURES

- 1.3V maximum dropout at full load current
- Fast transient response
- Output current limiting
- Built-in thermal shutdown
- Good noise rejection
- 3-Terminal Adjustable or Fixed 1.5V, 1.8V, 2.5V, 3.3V

■ APPLICATIONS

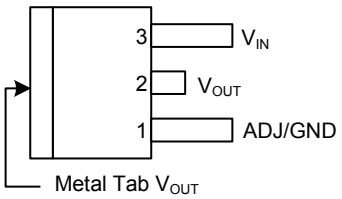
- PC Motherboard
- LCD Monitor
- Graphic Card
- DVD-video player
- NIC/Switch
- Telecom Equipment
- ADSL Modem
- Printer and other Peripheral Equipment

■ GENERAL DESCRIPTION

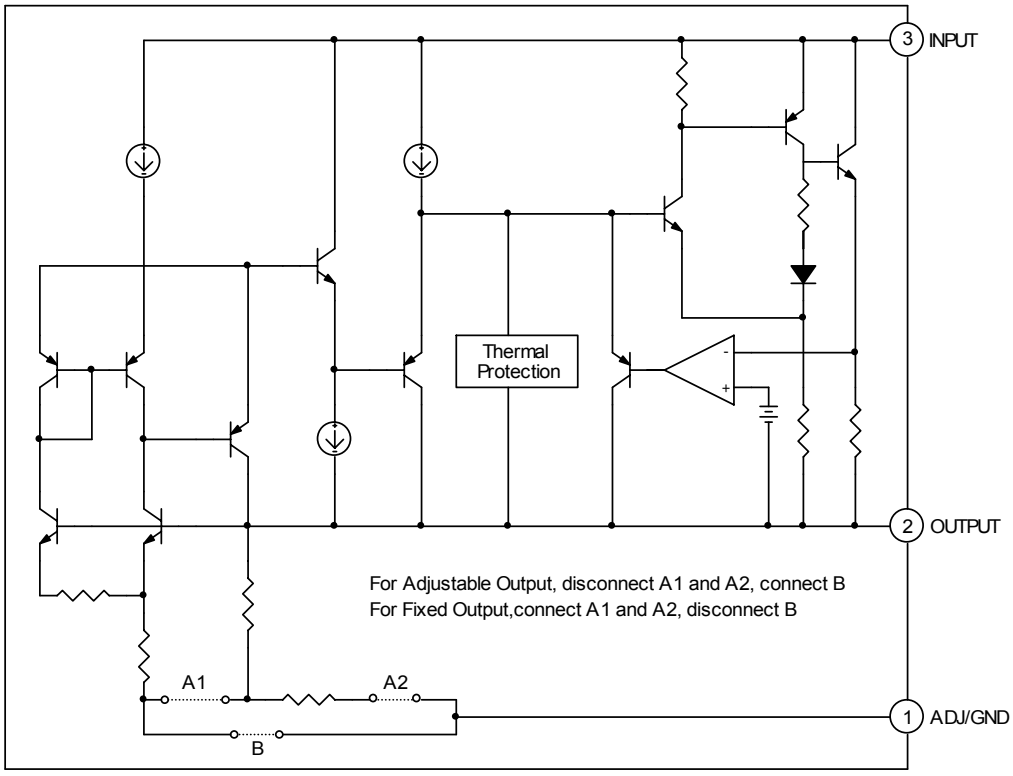
The CHC1117 is a series of low dropout three-terminal regulators with a dropout of 1.4V at 1A output current.
The CHC1117 series provides current limiting and thermal shutdown. Its circuit includes a trimmed bandgap reference to assure output voltage accuracy to be within 2% for 1.5V, 1.8V, 2.5V, 3.3.V and adjustable versions. Current limit is trimmed to ensure specified output current and controlled short-circuit current. On-chip thermal shutdown provides protection against any combination of overload and ambient temperature that would create excessive junction temperature.
The CHC1117 has an adjustable version that can provide the output voltage from 1.25V to 8V with only two external resistors.
The CHC1117 series is available in the industry standard TO252 and power packages.

■ PIN CONFIGURATION

(1) TO252



■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (NOTE 1)

Symbol	Parameter	Rating	Unit
V_{IN}	Input Voltage	9	V
T_J	Maximum Junction Temperature	150	°C
T_S	Storage Temperature	-65~150	°C
T_{LEAD}	Lead Temperature (10 sec.)	300	°C
ESD	ESD (Machine Model)	600	V

Note 1: Stresses greater than those listed under " Absolute Maximum Ratings" may cause permanent damage to the device. These are stress rating only, and functional operation of the device at these or any other conditions beyond those in dicated und er "Recommended Operating Conditions" i s not implie d. Exposure t o "Absolute Maximum Ratings" for extended periods may affect device reliability.

■ RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Rating	Unit
V_{IN}	Input V oltage	8	V
T_J	Operating Junction Temperature Range	-40~125	°C

■ ELECTRICAL CHARACTERISTICS

Operating Conditions: V_{IN}≤10V, T_J=25°C, unless otherwise specified

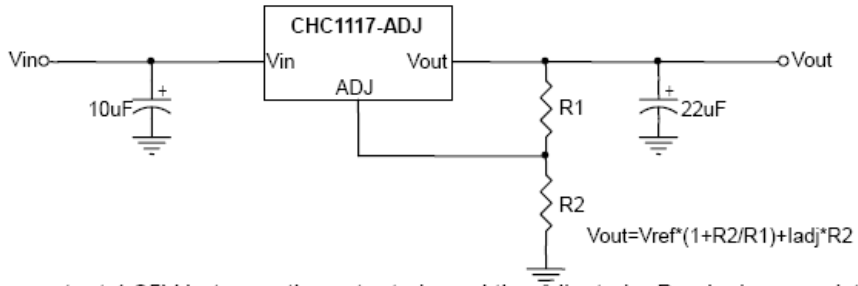
Parameter	Symbol	Test Condition		Min.	Typ.	Max.	Unit
Reference Voltage	V_{REF}	CHC1117 -Adj	I_O=10mA, V_{IN}-V_{OUT}=1.5V 1.225		1.250	1.275	V
			I_O=10mA,1.5V≤V_{IN}-V_{OUT}≤8V 1.225		1.250	1.275	
Output Voltage	V_{OUT}	CHC1117 -1.5	I_O=10mA, V_{IN}=3V 1.485		1.5	1.515	V
			I_O=10mA, 3V≤V_{IN}≤8V 1.470		1.5	1.530	
		CHC1117 -1.8	I_O=10mA, V_{IN}=3.3V 1.782		1.8	1.818	V
			I_O=10mA, 3.3V≤V_{IN}≤8V 1.764		1.8	1.836	V
		CHC1117 -2.5	I_O=10mA, V_{IN}=4V 2.475		2.5	2.5	V
			I_O=10mA, 4V≤V_{IN}≤8V 2.450		2.5	2.550	V
		CH1117 -3.3	I_O=10mA, V_{IN}=4.8V 3.267		3.3	3.333	V
			I_O=10mA, 4.8V≤V_{IN}≤8V 3.235		3.3	3.365	
Line Regulation	Reg_{LINE}	CHC1117-XXX	I_O=10mA,1.5V≤V_{IN}-V_{OUT}≤8V		0.3		%
Load Regulation	Reg_{Load}	CHC1117 -Adj	VIN= 3V, 10mA<Io<1A		0.5		%
		CHC1117 -1.5	VIN= 3V, 10mA<Io<1A		12	15	mV
		CHC1117 -1.8	VIN= 3.3V, 10mA<Io<1A		15	18	mV
		CHC1117 -2.5	VIN= 4V, 10mA<Io<1A		20	25	mV
		CHC1117 -3.3	VIN= 5V, 10mA<Io<1A		26	33	mV
Dropout Voltage	V_{IN}- V_{OUT}	CHC1117-XXX	I_{OUT} = 1A ,ΔV_{OUT}=1%V_{OUT}		1.3		V
Current Limit	I_{LIMT}	CHC1117-XXX	V_{IN}-V_{OUT}=3V		1.8		A
Ripple Rejection		CHC1117-XXX	F=120Hz,C_{OUT}=25uF Tantalum, V_{IN}-V_{OUT}=3V	57			dB
Temperature Stability		CHC1117-XXX	Io=10mA		0.07		%/°C

■ ELECTRICAL CHARACTERISTICS (CONTINUED)

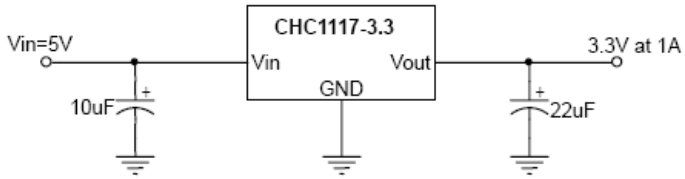
Operating Conditions: V_{IN}≤10V, T_J=25℃, unless otherwise specified

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Adjust Pin Current		I_O=10mA~1A, 1.5V≤V_{IN}-V_{OUT}≤8V		65		μA
Adjust Pin Current Change		I_O=10mA~1A, 1.4V≤V_{IN}-V_{OUT}≤8V		14		μA
Minimum Load Current(ADJ)		CHC1117 1.5V≤V_{IN}-V_{OUT}≤8V		0.4		mA
Quiescent Current	Iq	V_{IN}=V_{OUT}+1.25V		3		mA
Long-term Stability		T_A=125℃, 1000hrs		0.3		%
RMS Output Noise (% of V_{OUT})		T_A=25℃, 10Hz≤f≤10kHz		0.003		%
Power Dissipation	Pd	TO252		1.2		W
		SOT223		0.625		
Thermal Resistance, Junction to Ambient	θ_{JA}	TO252		55		℃/W
		SOT223		75		
Thermal Resistance, Junction to case	θ_{JC}	TO252		10		℃/W
		SOT223		15		
Thermal Shutdown		Junction Temperature		175		℃
Thermal Shutdown Hysteresis				25		℃

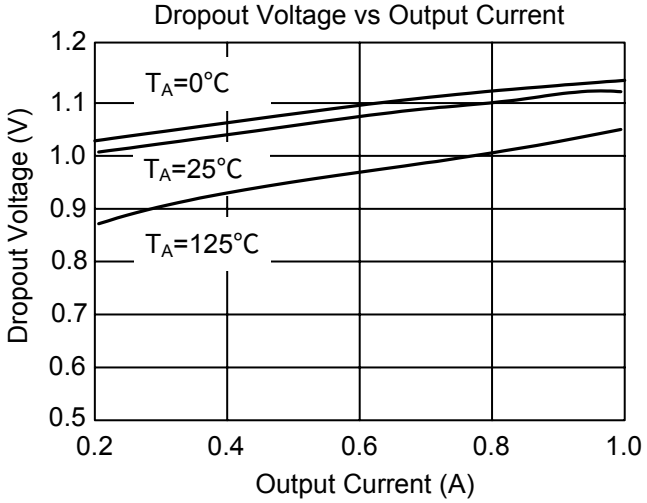
■ TYPICAL APPLICATIONS

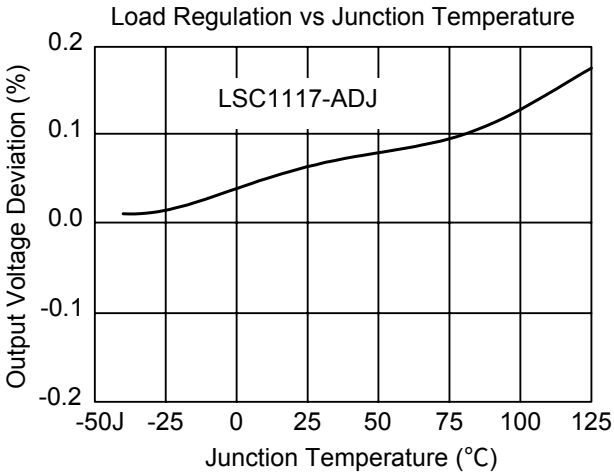


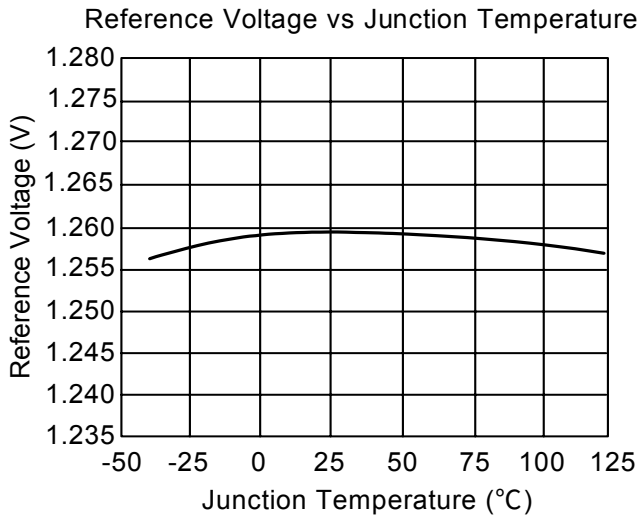
The CHC1117 keeps a constant 1.25V between the output pin and the adjust pin. By placing a resistor R1 across these two pins a constant current flows through R1, adding to the Iadj current and into the R2 resistor producing a voltage equal to the (1.25/R1)*R2+Iadj*R2 which will be added to the 1.25V to set the output voltage. This is summarized in the above equation. Since the minimum load current requirement of the CHC1117 is 10mA, R1 is typically selected to be 121Ω resistor so that it automatically satisfies the minimum current requirement. Notice that since Iadj is typically in the range of 50uA it only adds a small error to the output voltage and should only be considered when a very precise output voltage setting is required. For example, in a typical 3.3V application where R1=121Ω and R2=200Ω the error due to Iadj is only 0.3% of the nominal set point.

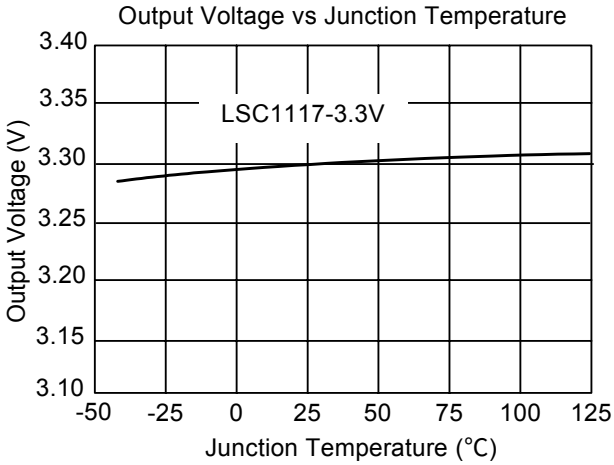


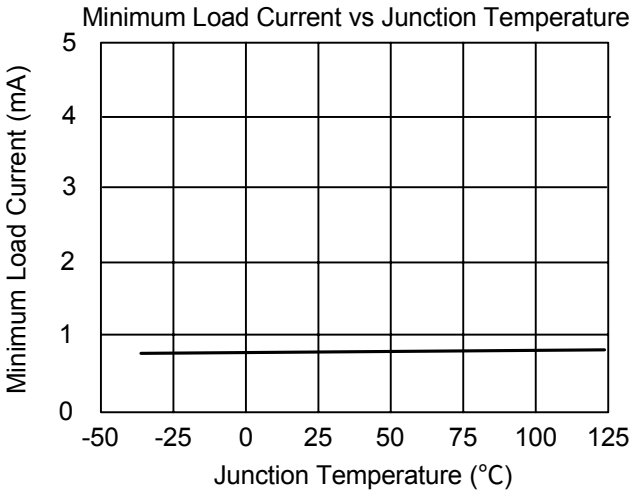
■ TYPICAL PERFORMANCE CHARACTERISTICS

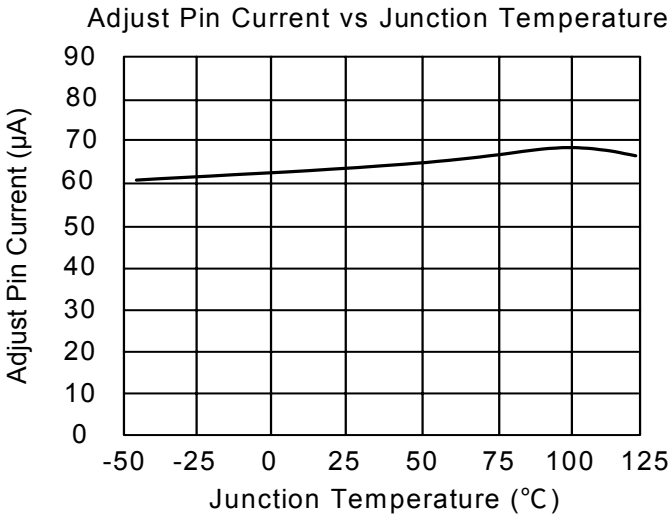




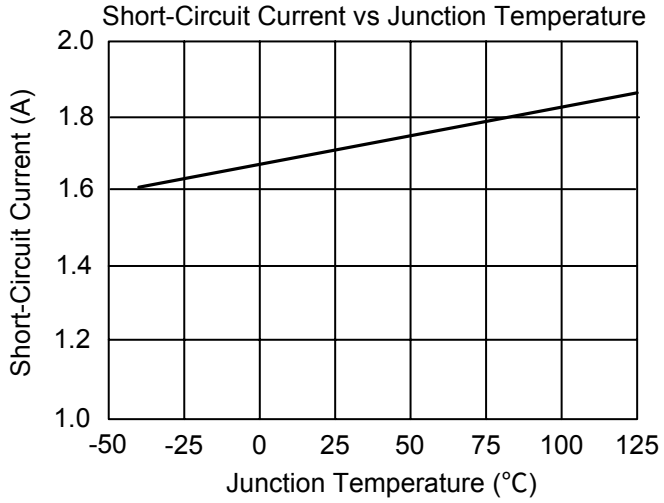


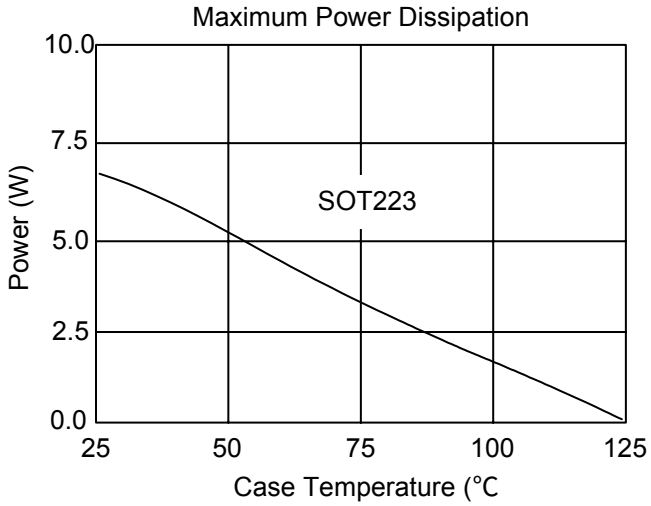


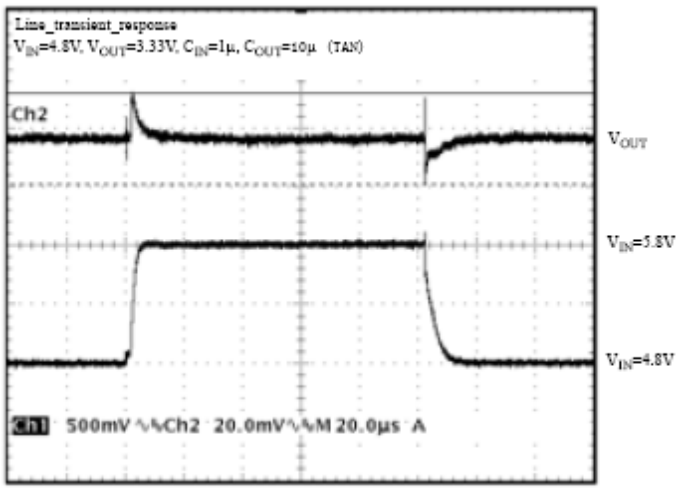




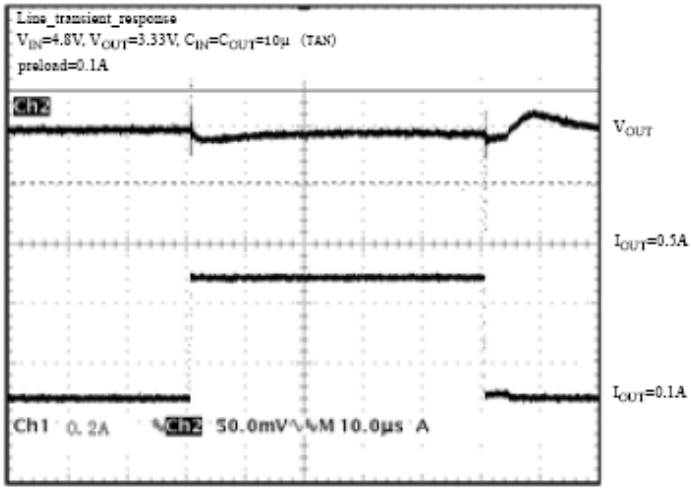
■ TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)



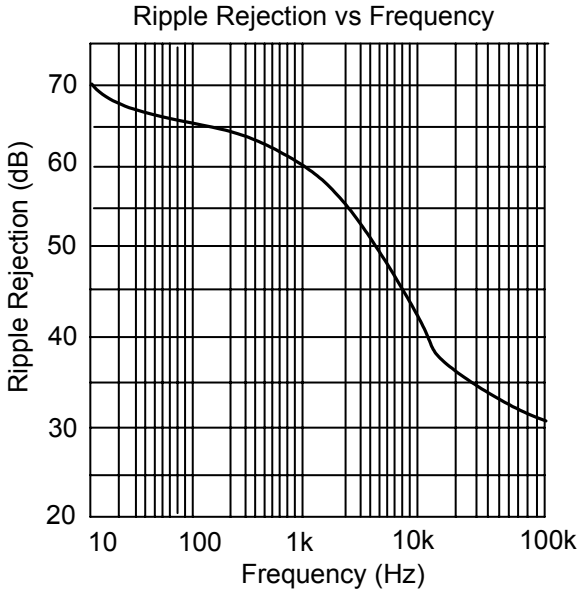




Line Transient Response



Load Transient Response



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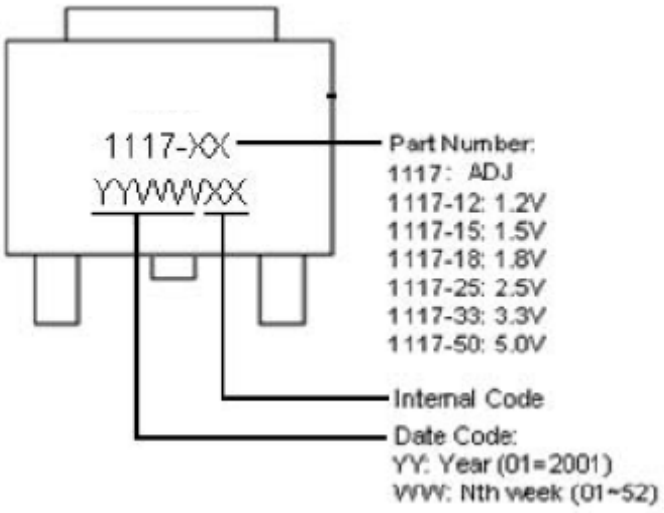
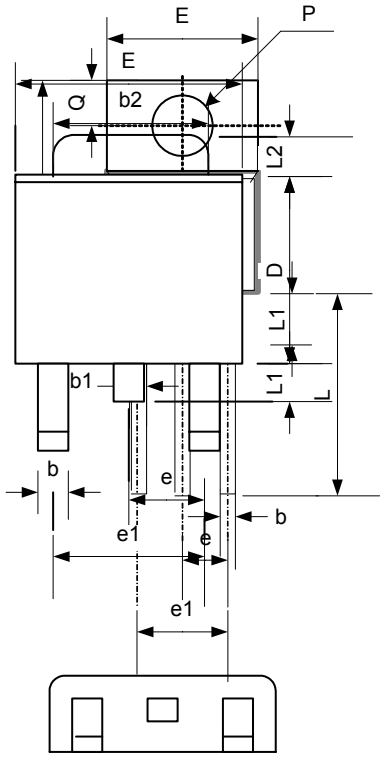
■ MARKING INFORMATION

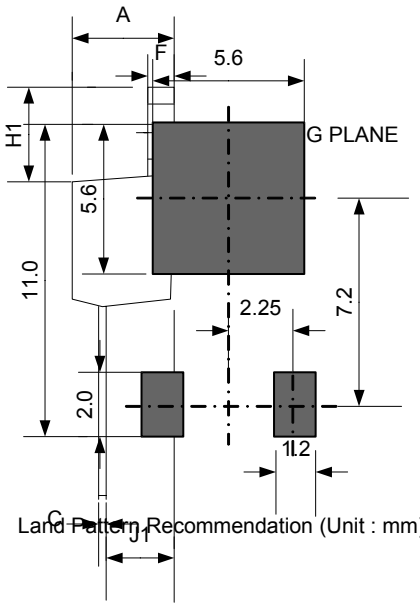
(1) TO252

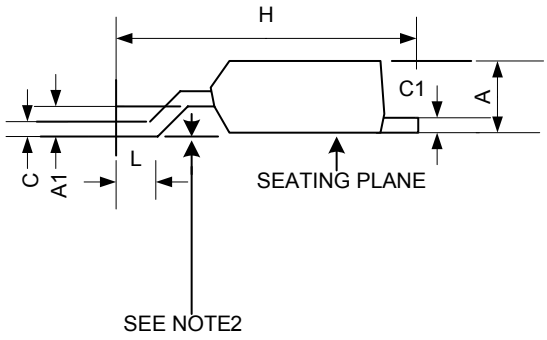


■ PACKAGE INFORMATION

(1) TO252







Notes:
1. JEDEC Outline:TO-252 AB
2. Mils suggested for positive contact at mounting

Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	2.18	2.29	2.39	0.086	0.090	0.094
A1	1.02	1.15	1.27	0.040	0.045	0.050
b		0.61TYP.			0.024TYP.	
b2	5.20	5.35	5.50	0.205	0.211	0.217
C	0.46	0.52	0.58	0.018	0.020	0.023
C1	0.46	0.52	0.58	0.018	0.020	0.023
D	5.33	5.57	5.80	0.210	0.219	0.228
E	6.35	6.58	6.80	0.250	0.259	0.268
e		2.25BSC.			0.089BSC.	
e1		4.50BSC.			0.177BSC.	
H	9.00	9.70	10.40	0.354	0.382	0.409
L	0.51			0.020		
L1	0.64	0.83	1.02	0.025	0.033	0.040
L2	1.52	1.78	2.03	0.060	0.070	0.080