

Description

AP1122 is a low dropout positive fixed-mode regulator with 1A output current capability. The product is specifically designed to provide well-regulated supply for low voltage IC applications such as high-speed bus termination and low current 1.2V logic supply. AP1122 is also well suited for other applications such as VGA cards. AP1122 is guaranteed to have lower than 1.3V dropout at full load current making it ideal to provide well-regulated outputs of 1.2 output voltage with 2.5V input voltage supply.

Applications

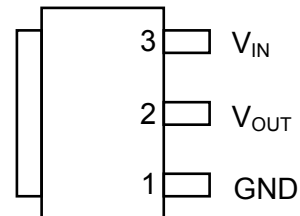
- PC peripheral
- Communication

Features

- 1.3V maximum dropout at full load current
- Fixed 1.2V± 2% output voltage
- Fast transient response
- Output current limiting
- Built-in thermal shutdown
- Good noise rejection
- Packages: SOT223-3L, TO252-3L, SOT89-3L, TO263-3L and TO220-3L
- SOT89-3L, SOT223-3L and TO252-3L: Available in “Green” Molding Compound (No Br, Sb)
- Lead Free Finish/ RoHS Compliant (Note 1)

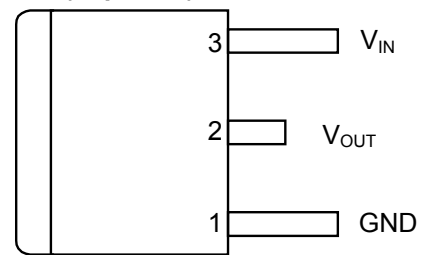
Pin Assignments

(Top View)



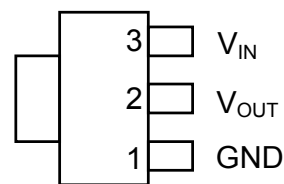
Tab is V_{OUT}
SOT223-3L

(Top View)



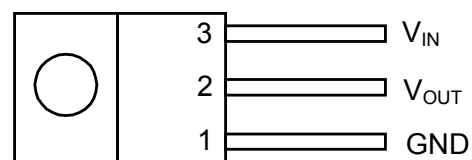
Tab is V_{OUT}
TO252-3L/ TO263-3L

(Top View)



Tab is V_{OUT}
SOT89-3L

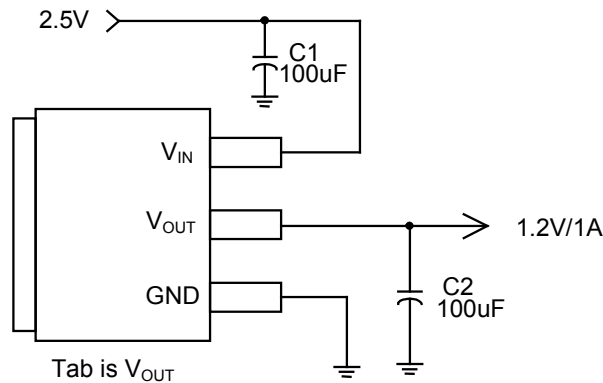
(Top View)



Tab is V_{OUT}
TO220-3L

Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html.

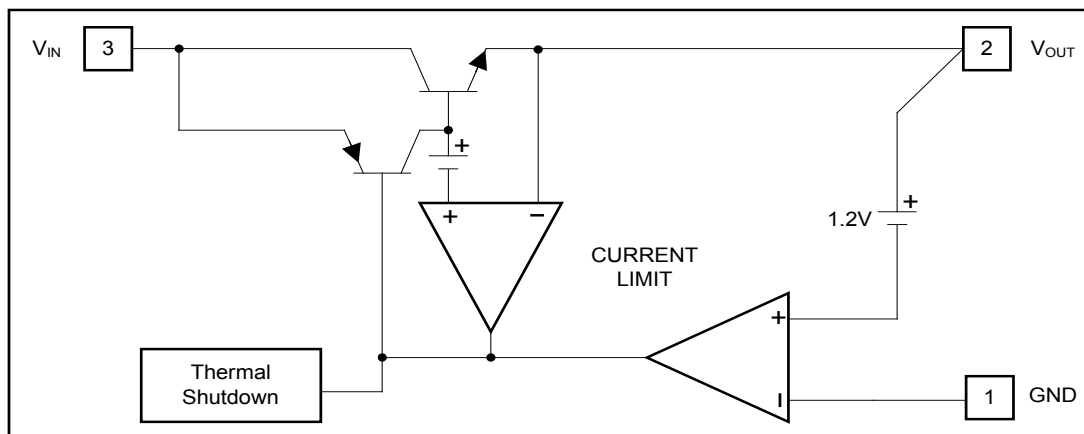
Typical Application Circuit



Pin Descriptions

Pin Name	I/O	Pin #	Description
GND	I	1	Ground Pin
V _{OUT}	O	2	The output of the regulator. A minimum of 10µF capacitor ($0.15\Omega \leq \text{ESR} \leq 20\Omega$) must be connected from this pin to ground to insure stability.
V _{IN}	I	3	The input pin of regulator. Typically a large storage capacitor is connected from this pin to ground to insure that the input voltage does not sag below the minimum dropout voltage during the load transient response.

Functional Block Diagram



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{IN}	DC Supply Voltage	-0.3 to 12	V
T_{ST}	Storage Temperature	-65 to +150	°C
T_{MJ}	Maximum Junction Temperature	150	°C

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
I_{OUT}	Output Current	-	1.0	A
T_{OP}	Operating Junction Temperature Range	0	125	°C

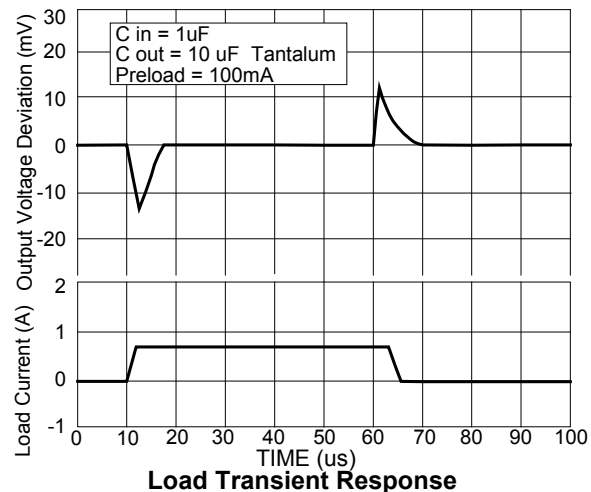
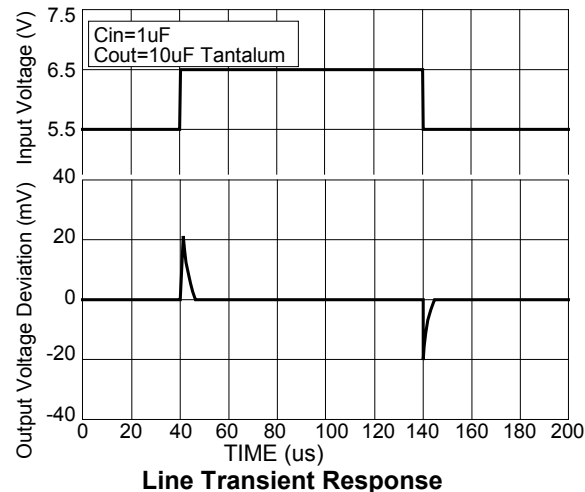
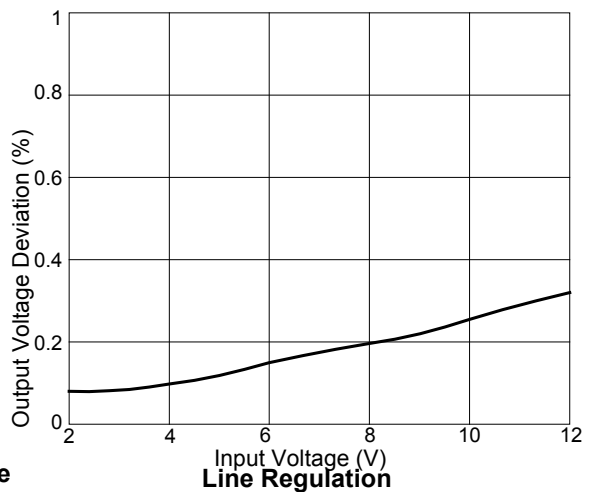
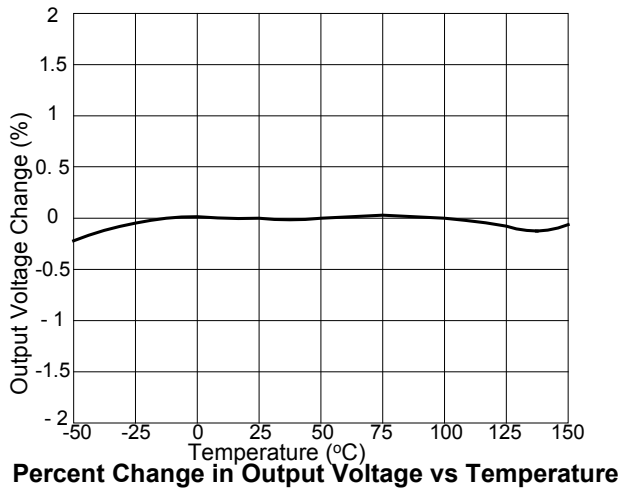
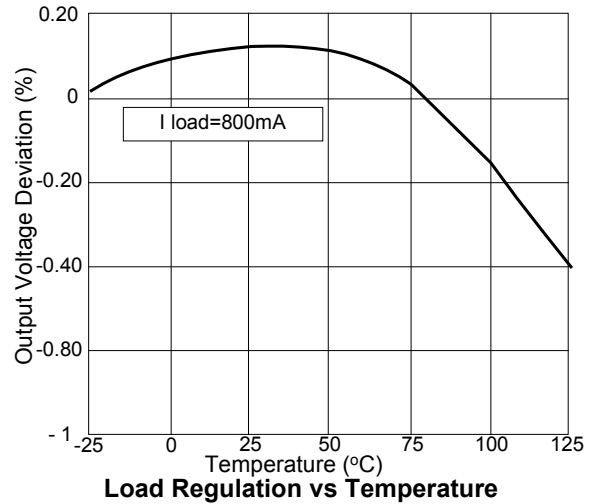
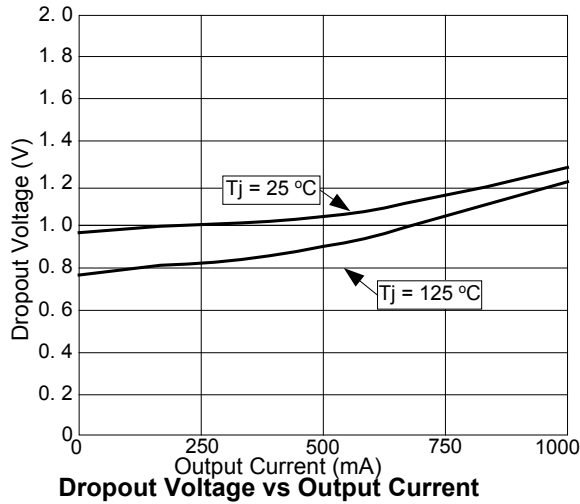
Electrical Characteristics (Under Operating Conditions)

Parameter	Test Conditions	Min	Typ.	Max	Unit
Output Voltage	$2.5V \leq V_{IN} \leq 12V$, $I_O=10mA$, $T_A=25^\circ C$	1.176	1.2	1.224	V
Line Regulation	$2.5V \leq V_{IN} \leq 12V$, $I_O=10mA$, $T_A=25^\circ C$			0.2	%
Load Regulation	$V_{IN}=2.5V \sim 12V$, $10mA < I_O < 1A$, $T_A=25^\circ C$ (Note 2, 3)			1	%
Dropout Voltage ($V_{IN}-V_{OUT}$)	$I_{OUT} = 1A$, $\Delta V_{OUT} = 1\%V_{OUT}$			1.3	V
Current Limit	$(V_{IN}-V_{OUT}) = 5V$	1.1			A
Minimum Load Current (Note 4)	$0^\circ C \leq T_J \leq 125^\circ C$		5	10	mA
Thermal Regulation	$T_A=25^\circ C$, 30ms pulse		0.008	0.04	%/W
Ripple Rejection	$F=120Hz$, $C_{OUT}=25\mu F$ Tantalum, $I_{OUT}=1A$, $V_{IN}=V_{OUT}+3V$		60	70	dB
Temperature Stability	$I_O=10mA$		0.5		%
θ_{JA} Thermal Resistance Junction-to-Ambient	SOT89-3L: Control Circuitry/Power Transistor (Note 5)		182		°C/W
	SOT223-3L: Control Circuitry/Power Transistor (Note 6)		107		
	TO252-3L: Control Circuitry/Power Transistor (Note 5)		73		
	TO220-3L: Control Circuitry/Power Transistor (Note 5)		78		
	TO263-3L: Control Circuitry/Power Transistor (Note 5)		60		
θ_{JC} Thermal Resistance Junction-to-Case	SOT89-3L: Control Circuitry/Power Transistor (Note 5)		42		°C/W
	SOT223-3L: Control Circuitry/Power Transistor (Note 6)		16		
	TO252-3L: Control Circuitry/Power Transistor (Note 5)		12		
	TO220-3L: Control Circuitry/Power Transistor (Note 5)		3.5		
	TO263-3L: Control Circuitry/Power Transistor (Note 5)		3.5		

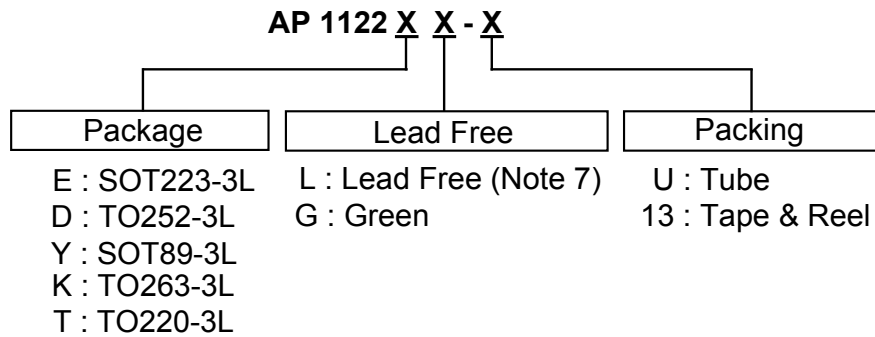
- Notes:
- See thermal regulation specifications for changes in output voltage due to heating effects. Line and load regulation are measured at a constant junction temperature by low duty cycle pulse testing. Load regulation is measured at the output lead = 1/18" from the package.
 - Line and load regulation are guaranteed up to the maximum power dissipation of 15W. Power dissipation is determined by the difference between input and output differential and the output current. Guaranteed maximum power dissipation will not be available over the full input/output range.
 - Quiescent current is defined as the minimum output current required in maintaining regulation. At 12V input/output differential the device is guaranteed to regulate if the output current is greater than 10mA.
 - Test conditions for SOT89-3L, TO252-3L, TO220-3L, and TO263-3L: Devices mounted on FR-4 substrate, single sided PC board, 2oz copper, with minimum recommended pad layout, no air flow.
 - Test condition for SOT223-3L: Device mounted on FR-4 substrate, single sided PC board, 2oz copper, with 5mmX5mm thermal pad layout, no air flow.









OBSOLETE - PART DISCONTINUED

Typical Performance Characteristics



Ordering Information



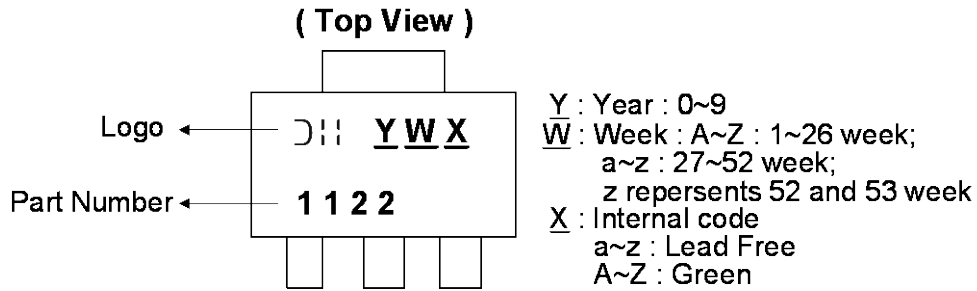
Device	Package Code	Packaging (Note 8)	Tube		13" Tape and Reel	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix
 AP1122EL-13	E	SOT223-3L	NA	NA	2500/Tape & Reel	-13
 AP1122EG-13	E	SOT223-3L	NA	NA	2500/Tape & Reel	-13
 AP1122DL-13	D	TO252-3L	NA	NA	2500/Tape & Reel	-13
 AP1122DG-13	D	TO252-3L	NA	NA	2500/Tape & Reel	-13
 AP1122YL-13	Y	SOT89-3L	NA	NA	2500/Tape & Reel	-13
 AP1122YG-13	Y	SOT89-3L	NA	NA	2500/Tape & Reel	-13
 AP1122KL-13	K	TO263-3L	NA	NA	800/Tape & Reel	-13
 AP1122TL-U	T	TO220-3L	50	-U	NA	NA

Notes: 7. TO263-3L and TO220-3L are available in "Lead Free" products only.
 8. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>

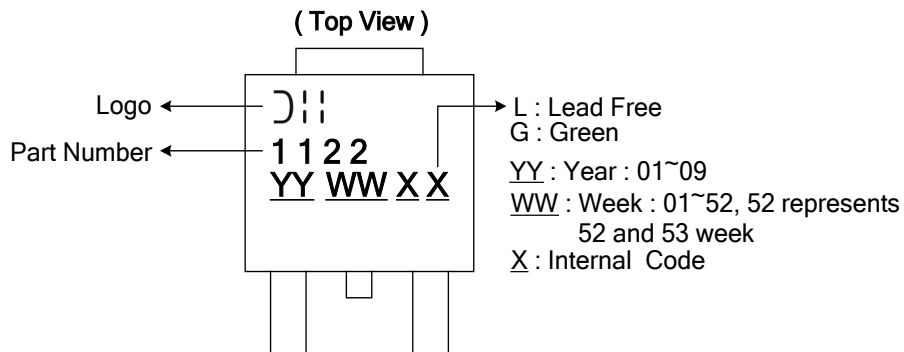
OBSOLETE - PART DISCONTINUED

Marking Information

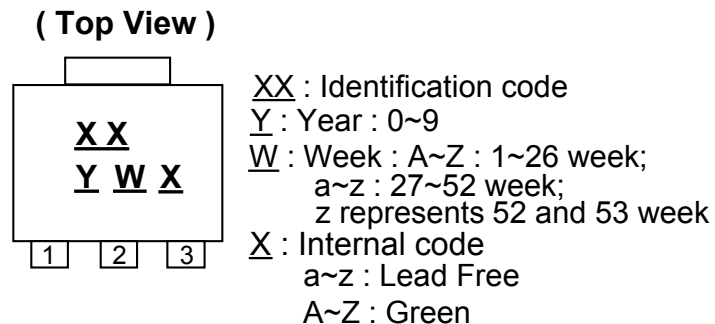
(1) SOT223-3L



(2) TO252-3L



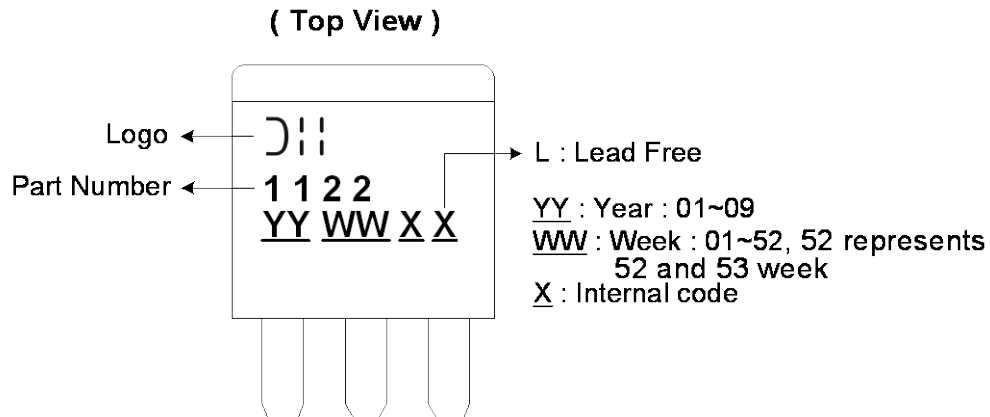
(3) SOT89-3L



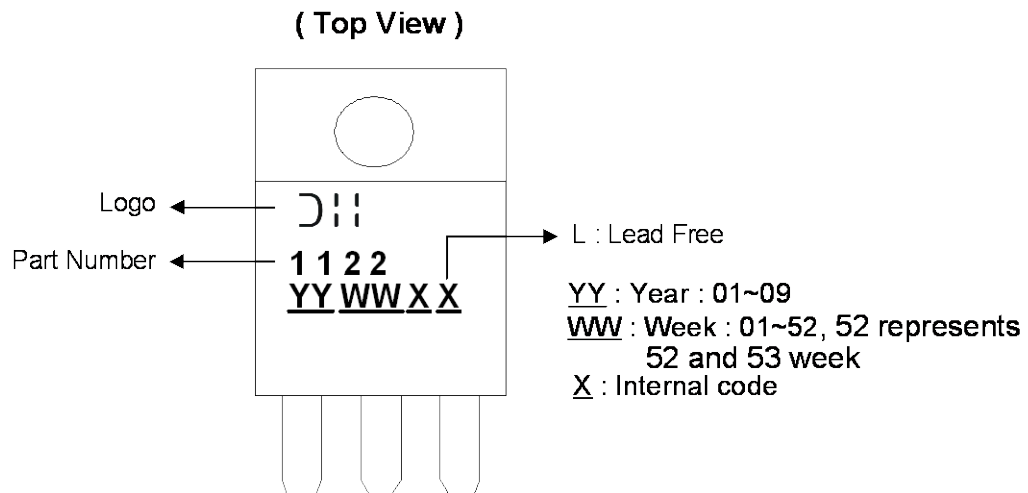
Part Number	Package	Identification Code
AP1122	SOT89-3L	JB

Marking Information (Continued)

(4) TO263-3L

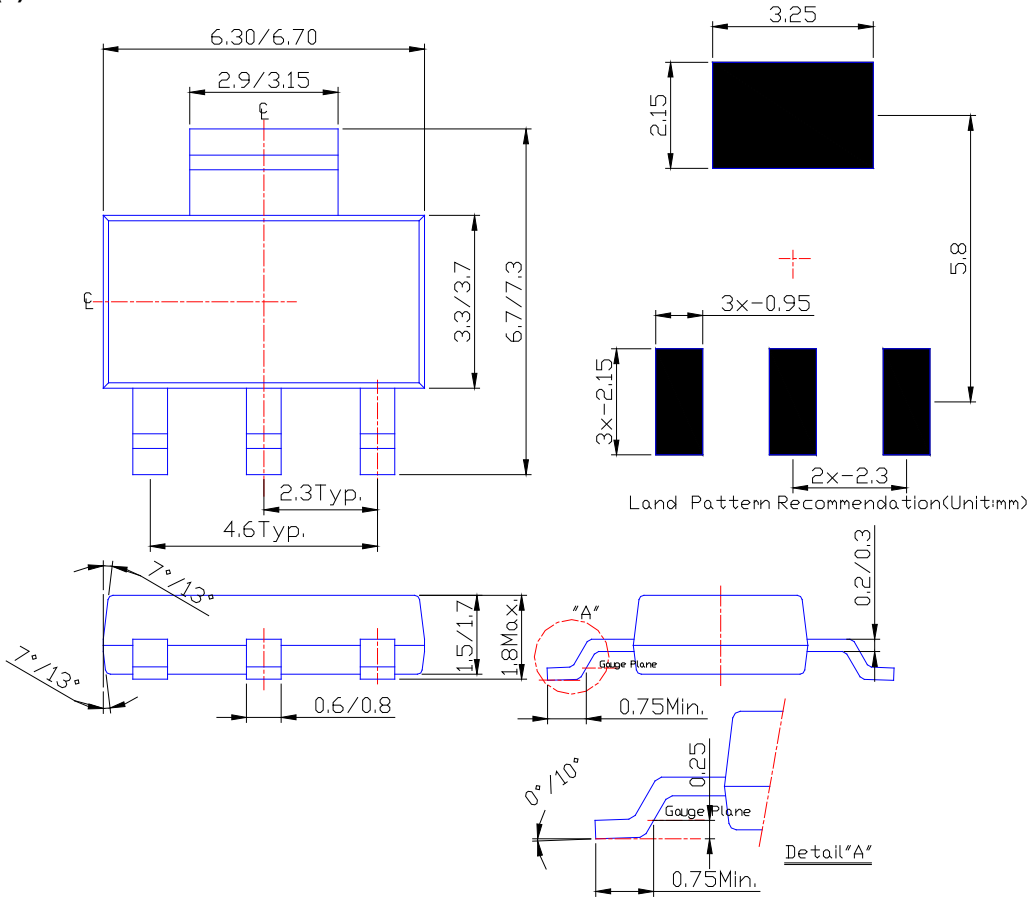


(5) TO220-3L



Package Outline Dimensions (All Dimensions in mm)

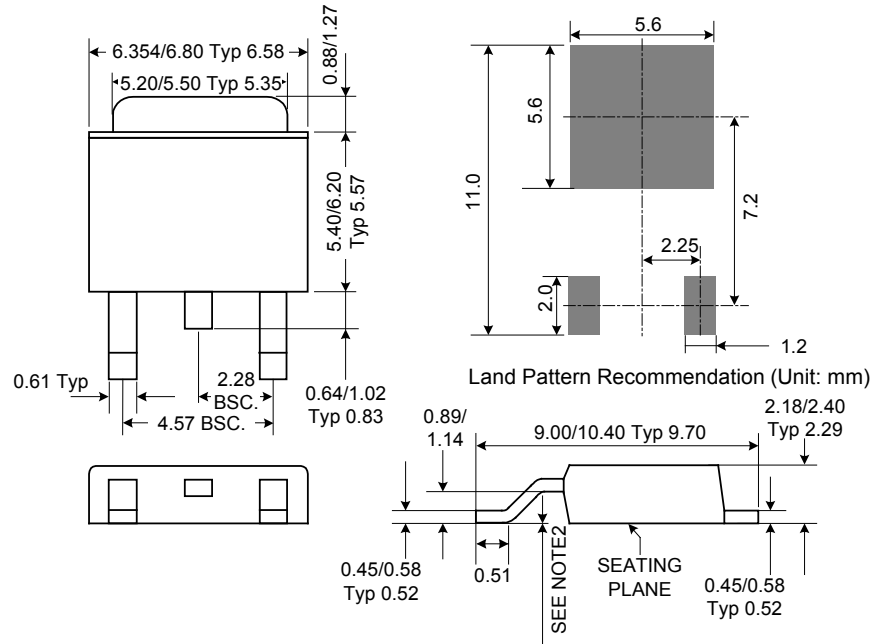
(1) SOT223-3L



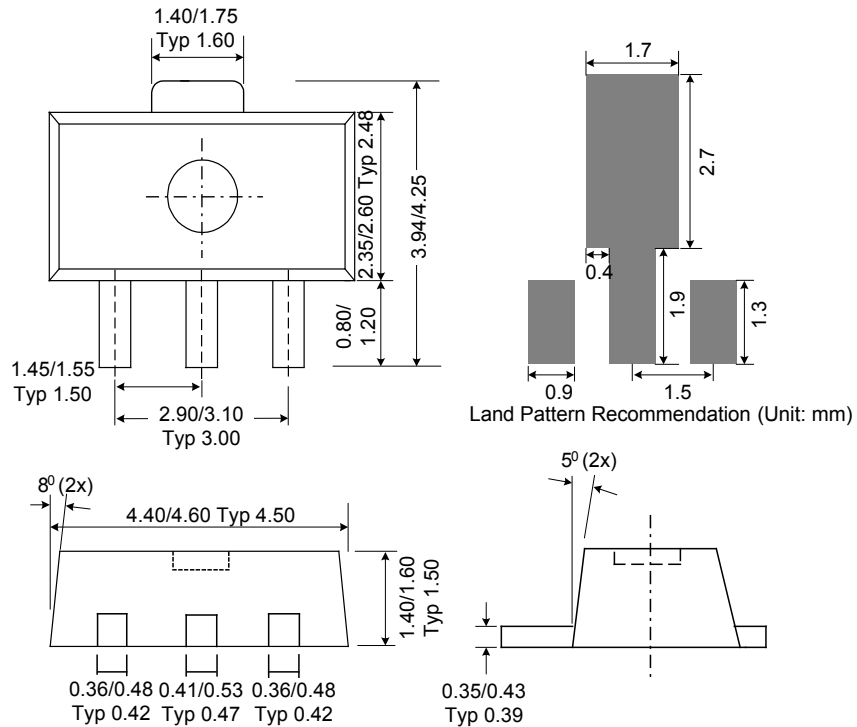
OBSOLETE - PART DISCONTINUED

Package Outline Dimensions (Continued)

(2) TO252-3L



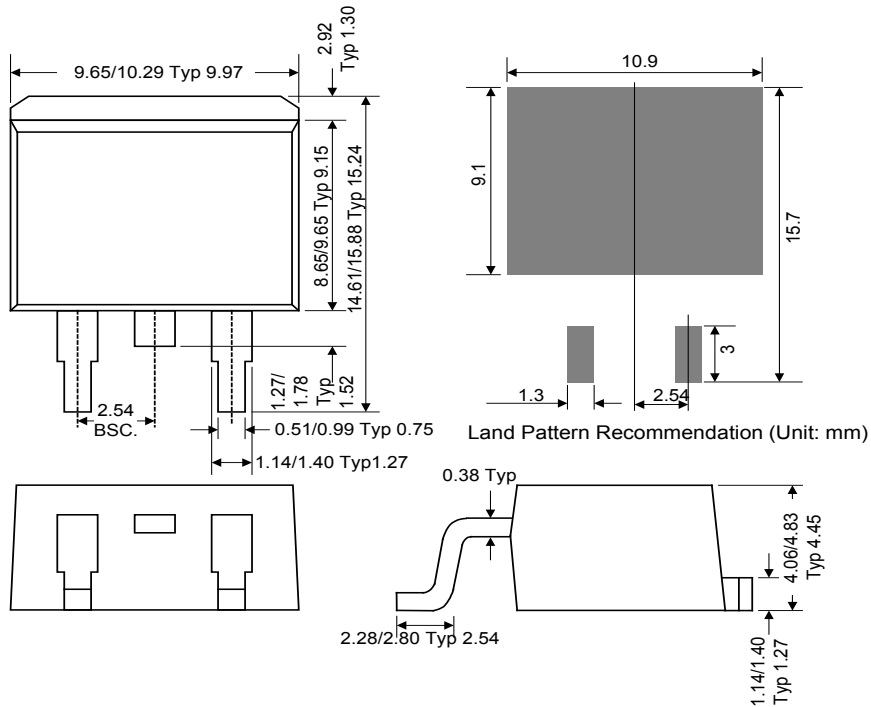
(3) SOT89-3L



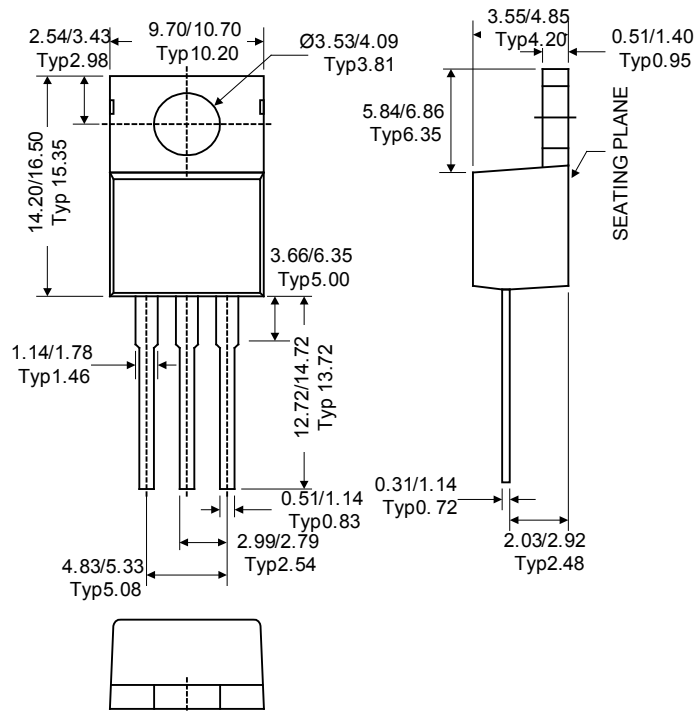
OBSOLETE - PART DISCONTINUED

Package Outline Dimensions (Continued)

(4) TO263-3L



(5) TO220-3L



OBSOLETE - PART DISCONTINUED

IMPORTANT NOTICE

1. DIODES INCORPORATED AND ITS SUBSIDIARIES (“DIODES”) MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).
2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes products. Diodes products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of the Diodes products for their intended applications, (c) ensuring their applications, which incorporate Diodes products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.
3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes’ websites, harmless against all damages and liabilities.
4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes’ website) under this document.
5. Diodes products are provided subject to Diodes’ Standard Terms and Conditions of Sale (<https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/>) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.
6. Diodes products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.
7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.
8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.

Copyright © 2021 Diodes Incorporated

www.diodes.com