

# 8178

## PRODUCT PREVIEW

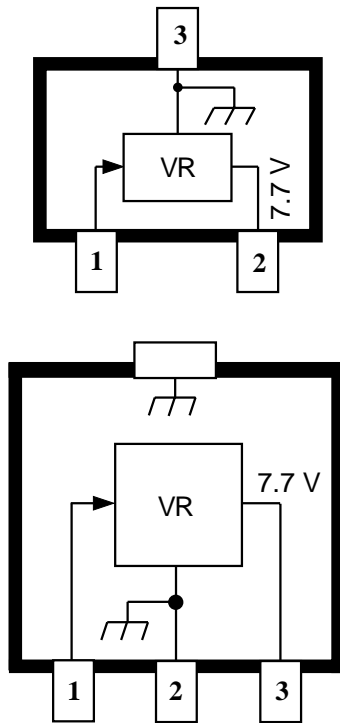
(Subject to change without notice)

April 5, 1996

## LOW-DROPOUT, 7.7 V PREREGULATOR

Designed specifically to meet the stringent requirements of automotive applications, the A8178LLR and A8178LLT provide an output voltage of  $7.7\text{ V} \pm 15\%$  for supply voltages greater than 6.9 V. They also provide a low-dropout tracking output for supply voltages down to 2.5 V. These regulators are intended to be used with sensitive automotive electronics systems that do not have the capability of low dropout operation and cannot withstand the high-voltage transients typical of automotive applications. These 7.7 V preregulators will withstand all ISO pulses (ignition coil disconnect requires an external diode) and will continue to operate during positive power supply transients (noise).

These devices are supplied in small-outline plastic transistor packages for surface-mount applications. The A8178LLR is supplied in the minimum footprint SOT-23/TO-236AB; the A8178LLT is furnished in the SOT-89/TO-243AA for increased allowable package power dissipation.



Dwg. PD-0xx

### ABSOLUTE MAXIMUM RATINGS

Input Voltage,  $V_I$  ..... 30 V

Reverse Input Voltage,  $V_{RI}$  ..... -120 V

Output Current,  $I_O$  ..... TBD\*

Operating Temperature Range,

$T_A$  ..... -40°C to +150°C

Junction Temperature,  $T_J$  ..... +150°C

Storage Temperature Range,

$T_S$  ..... -40°C to +170°C

\* Output current rating is limited by input voltage, duty cycle, and ambient temperature. Under any set of conditions, do not exceed a junction temperature of +150°C. See next page.

*This document contains information on a product under development. Allegro MicroSystems, Inc. reserves the right to change or discontinue this product without notice.*

Always order by complete part number: **A8178LLT**.

# 8178

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### ELECTRICAL CHARACTERISTICS over operating temperature range.

Characteristic	Symbol	Test Conditions	Limits			Units
			Min.	Typ.	Max.	
Output Voltage	$V_O$	$6.9\text{ V} \leq V_I \leq 24\text{ V}$	6.5	7.7	8.8	V
		$2.5\text{ V} \leq V_I \leq 6.9\text{ V}$	$V_I - 0.4$	—	—	V
		$V_I = 120\text{ V}$ , pulse test	—	—	11	V
Output Volt. Temp. Coeff.	$\alpha_{VO}$		—	—	TBD	mV/°C
Line Regulation	$\Delta V_{O(\Delta VI)}$		—	—	TBD	mV
Load Regulation	$\Delta V_{O(\Delta IO)}$		—	—	TBD	mV
Quiescent Current	$I_Q$	$V_I = 13.5\text{ V}$ , $I_O = 0$	—	—	2.5	mA
		$2.5\text{ V} \leq V_I \leq 8\text{ V}$ , $I_O = 0$	—	—	5.6	mA
Power Dissipation	$P_d$	$V_I = 13.5\text{ V}$ , $I_O = 15\text{ mA}$	—	—	130	mW
Thermal Resistance*	$R_{\theta JA}$	A8178LLR	—	575	—	°C/W
		A8178LLT	—	200	—	°C/W

Typical values are at  $T_A = +25^\circ\text{C}$  and are given for circuit design information only.

\*Mounted on 2.24" x 2.24" solder-coated copper-clad board in still air.

### INTERNAL PROTECTIVE FEATURES

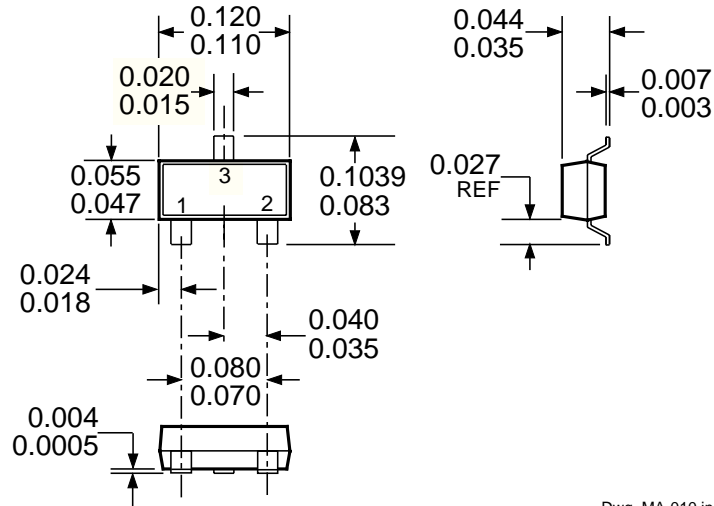
ISO Pulse No.	Test	Test Conditions (at $T_A = +25^\circ\text{C}$ )
1	Inductive Turn Off (Negative)	$V_S = -100\text{ V}$ , $R_S = 10\ \Omega$ , $t_r = 1\ \mu\text{s}$ , $t_d = 2\text{ ms}$
2	Inductive Turn Off (Positive)	$V_S = 100\text{ V}$ , $R_S = 10\ \Omega$ , $t_r = 1\ \mu\text{s}$ , $t_d = 50\ \mu\text{s}$ , non-operating
3a	Capacitive/Inductive Coupling (Neg)	$V_S = -150\text{ V}$ , $R_S = 50\ \Omega$ , $t_r = 50\text{ ns}$ , $t_d = 100\text{ ns}$
3b	Capacitive/Inductive Coupling (Pos)	$V_S = 100\text{ V}$ , $R_S = 50\ \Omega$ , $t_r = 50\text{ ns}$ , $t_d = 100\text{ ns}$
4	Reverse Battery	$V_S = -14\text{ V}$ , $t_d = 20\text{ s}$ , non-operating
5	Load Dump	$V_S = 86.5\text{ V}$ , $R_S = 0.5\ \Omega$ , $t_r = 5\text{ ms}$ , $t_d = 400\text{ ms}$
6	Ignition Coil Disconnect EXTERNAL PROTECTION REQ'D	$V_S = -300\text{ V}$ , $R_S = 30\ \Omega$ , $t_r = 60\ \mu\text{s}$ , $t_d = 300\ \mu\text{s}$
7	Field Decay (Negative)	$V_S = -80\text{ V}$ , $R_S = 10\ \Omega$ , $t_r = 5\text{ ms}$ , $t_d = 100\text{ ms}$



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**7.7 V PREREGULATOR**

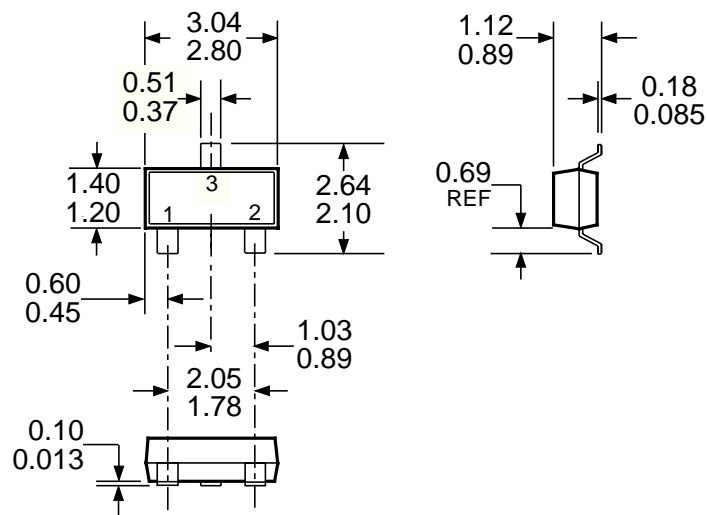
**A8178LLR**

Dimensions in Inches  
(for reference only)



Dwg. MA-010 in

Dimensions in Millimeters  
(controlling dimensions)



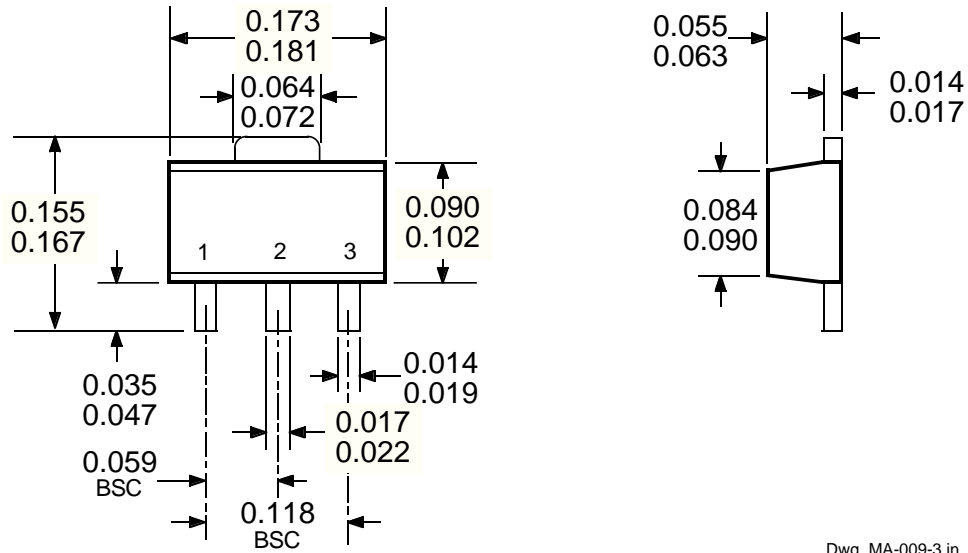
Dwg. MA-010 mm

- NOTES: 1. Lead spacing tolerance is non-cumulative.  
2. Exact body and lead configuration at vendor's option within limits shown.

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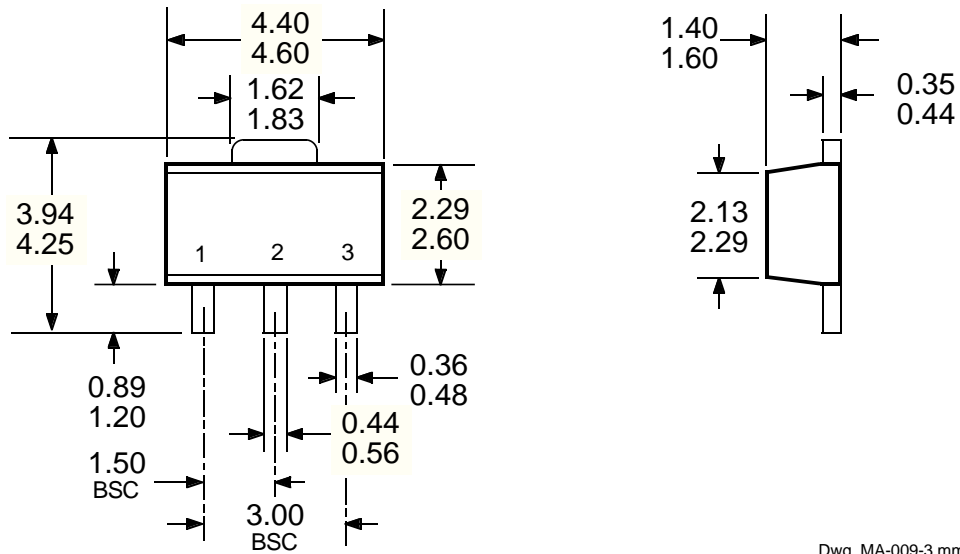
## A8178LLT

Dimensions in Inches  
(for reference only)



Dwg. MA-009-3 in

Dimensions in Millimeters  
(controlling dimensions)



Dwg. MA-009-3 mm

- NOTES: 1. Lead spacing tolerance is non-cumulative.  
2. Exact body and lead configuration at vendor's option within limits shown.

*Allegro MicroSystems, Inc. reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the design of its products.*

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