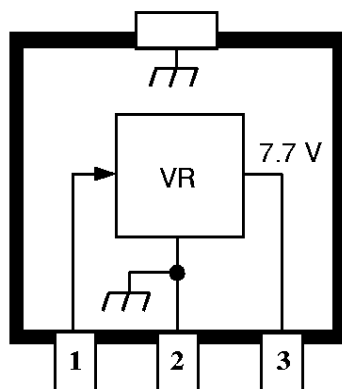
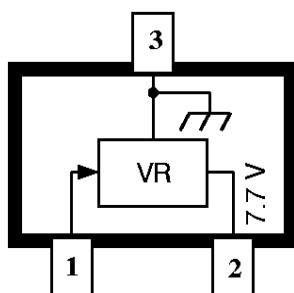


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LOW-DROPOUT, 7.7 V PREREGULATOR



Dwg. PB

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.

Designed specifically to meet the stringent requirements of automotive applications, the A8178LLR and A8178LLT provide an output voltage of 7.7 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.

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**

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LOW-DROPOUT, 7.7 V PREREGULATOR

ELECTRICAL CHARACTERISTICS over operating temperature range.

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
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.	α_{VO}		—	—	TBD	mV/°C
Line Regulation	$\Delta V_{O(\Delta V_I)}$		—	—	TBD	mV
Load Regulation	$\Delta V_{O(\Delta I_O)}$		—	—	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.

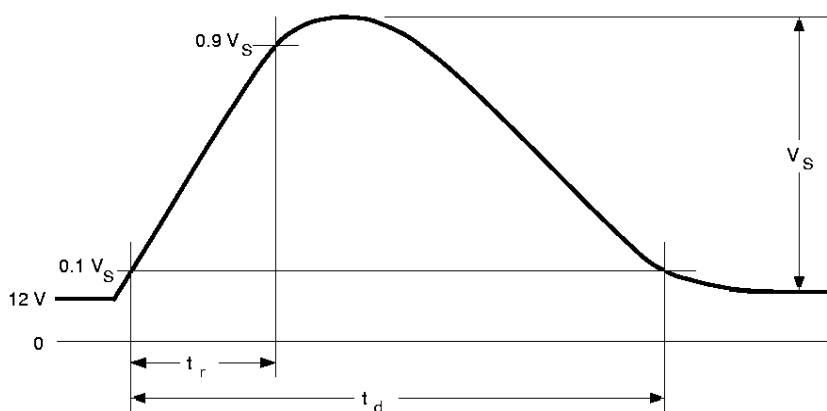
*Mounted on 2.24" x 2.24" solder-coated copper-clad board in still air.

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LOW-DROPOUT, 7.7 V PREREGULATOR

INTERNAL PROTECTIVE FEATURES

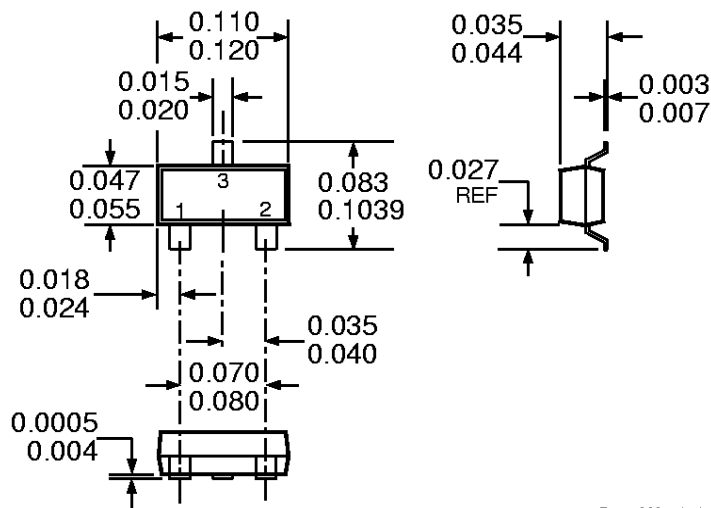
ISO Pulse No.	Test	Test Conditions (at $T_A = +25^\circ\text{C}$)
1	Inductive Turn Off (Negative)	$V_S = -100\text{ V}$, $R_S = 10\ \Omega$, $t_r = 1\ \mu\text{s}$, $t_d = 2\text{ ms}$
2	Inductive Turn Off (Positive)	$V_S = 100\text{ V}$, $R_S = 10\ \Omega$, $t_r = 1\ \mu\text{s}$, $t_d = 50\ \mu\text{s}$, 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)	$V_S = -80\text{ V}$, $R_S = 10\ \Omega$, $t_r = 5\text{ ms}$, $t_d = 100\text{ ms}$



Drawn: WJH-LNR

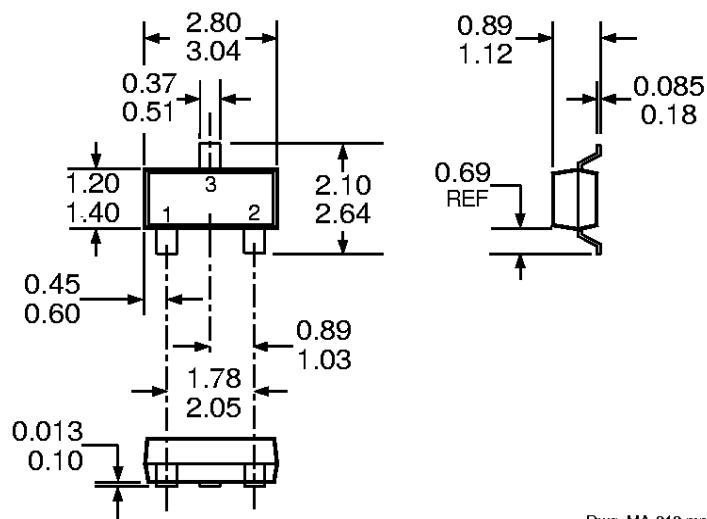
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LOW-DROPOUT,
7.7 V PREREGULATOR

A8178LLR
Dimensions in Inches
(for reference only)



Dwg. MA-010 in

Dimensions in Millimeters
(controlling dimensions)

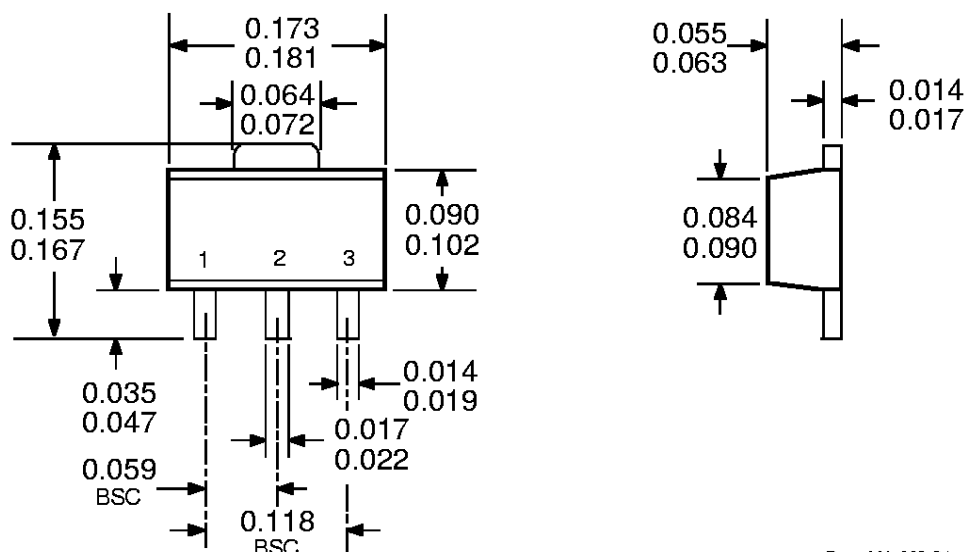


Dwg. MA-010 mm

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

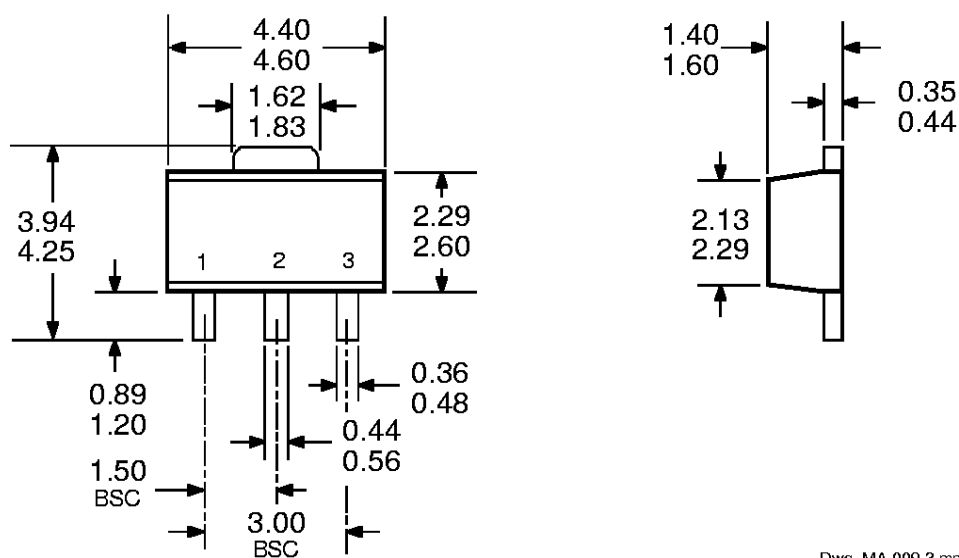
8178 LOW-DROPOUT, 7.7 V PREREGULATOR

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.

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LOW-DROPOUT,
7.7 V PREREGULATOR

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