DESCRIPTION

The RS7805 and RS7812 can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each employs internal current limiting, thermal shut-down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

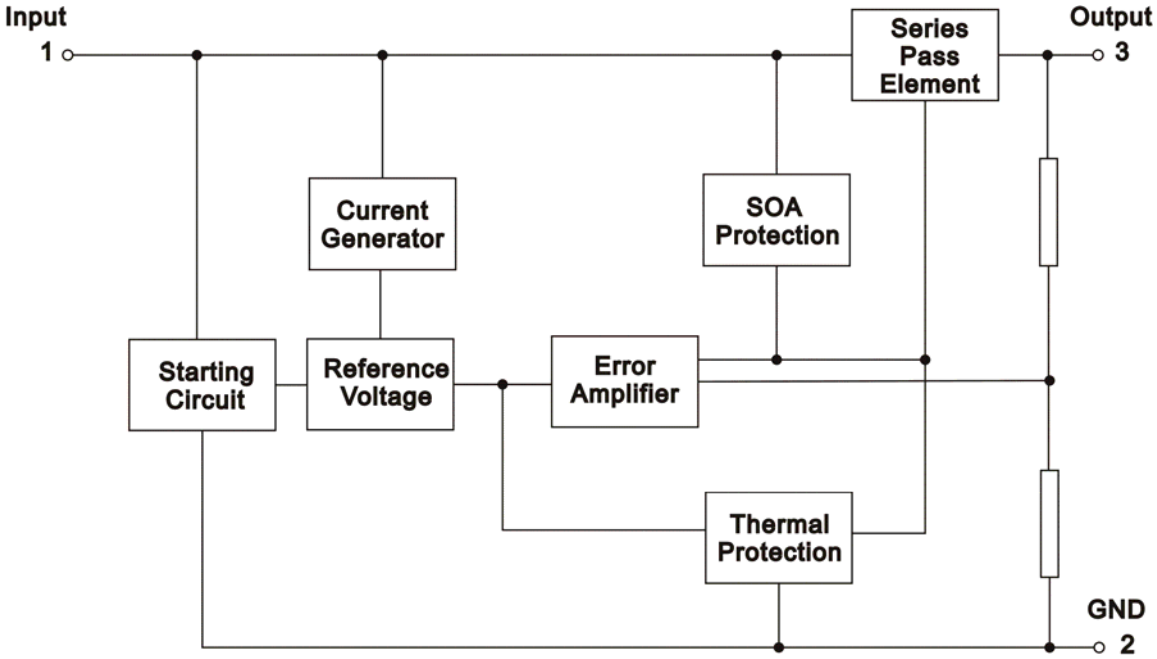
FEATURES

- Output current in excess of 1A
- Output voltages of 5V,12V
- Internal short-circuit current limiting & thermal overload protection
- Guaranteed in extended temperature range

APPLICATIONS

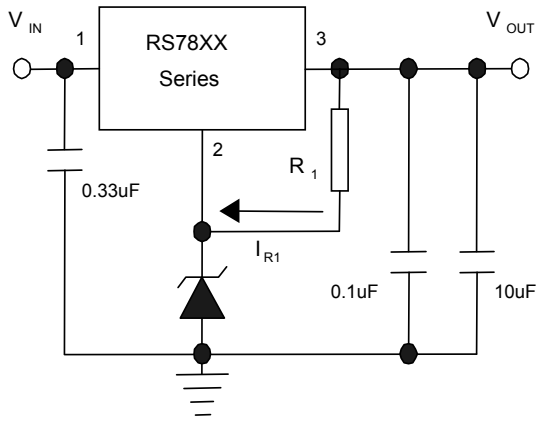
- SCSI-2 active termination
- High efficiency linear regulators
- 5V to 3.3V voltage converter
- Battery charger
- Battery management circuits for notebook and palmtop PCs
- Core voltage supply: FPGA, PLD, DSP, CPU

SCHEMATIC DIAGRAM



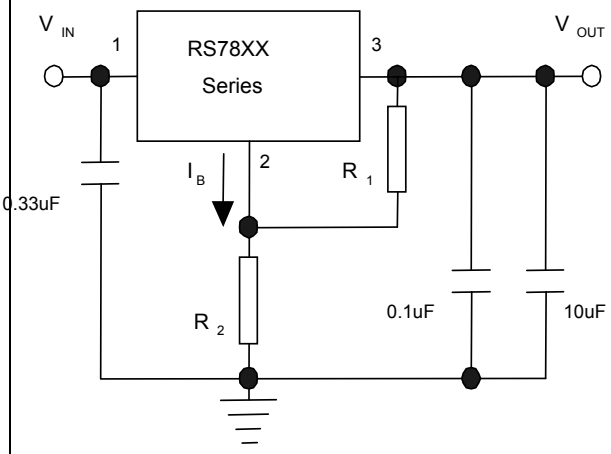
APPLICATION CIRCUITS

Constant Current Regulator



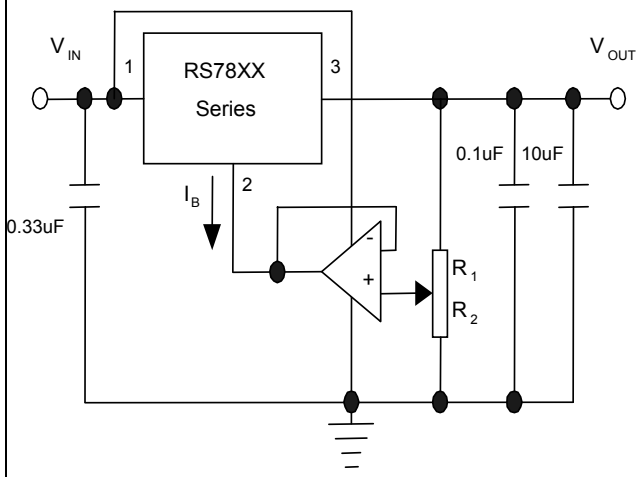
$V_{OUT}=V_{OUT(IC)}+V_Z$
$I_1=V_{OUT(IC)}/R_1$

Circuit for Increasing Output Voltage



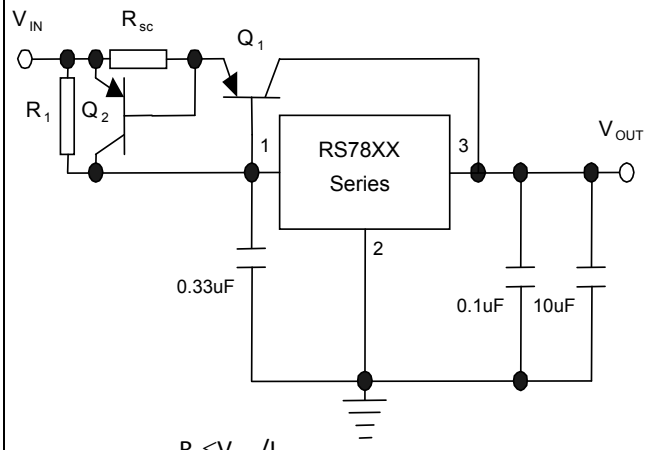
$V_{OUT}=V_{OUT(IC)}(1+R_2/R_1)+R_2*I_B$

Adjustable Output Regulator



$V_{OUT}=V_{OUT(IC)}(1+R_2/R_1)$

High Output Current with Short-circuit Protection



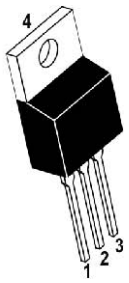
$R_1 \leq V_{BE1}/I_{B(max)}$
$R_{SC}=V_{BE2}/I_{SC}$, I_{SC}: Short-Circuit Current

ORDER INFORMATION

Part Number	V_{OUT}	Package
RS7805E	5V±0.15V	TO-220AB
RS7812E	12V±0.36V	

PIN ASSIGNMENTS

TO-220-3



PIN DESCRIPTION

Package	Pin No.	Pin Name	Description
TO-220-3	1	VIN	Regulator Input Pin
	2, 4	GND	Ground Pin
	3	VOUT	Regulator Output Pin

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Maximum	Unit
Input Voltage	V_{IN}	40	V
Power Dissipation	P_D	Internally limited (Note)	W
Operating Temperature	T_{OPR}	0 to 125	°C
Storage Temperature	T_{STG}	-40 to 150	°C
Junction Temperature	T_J	150	°C

Note:
T_A=25°C, TO-220AB: 2.7W

THERMAL DATA

Characteristic	Symbol	TO-220AB	Unit
Thermal Resistance Junction-Case	$R_{th(j-c)}$	12.5	°C/W
Thermal Resistance Junction-Ambient	$R_{th(j-a)}$	47	°C/W

RS7805 SERIES ELECTRICAL CHARACTERISTICS

V_{IN}=10V, I_{OUT}=500mA, C_{IN}=0.33uF, C_{OUT}=0.1uF, 0°C≤T_J≤125°C (unless otherwise specified)

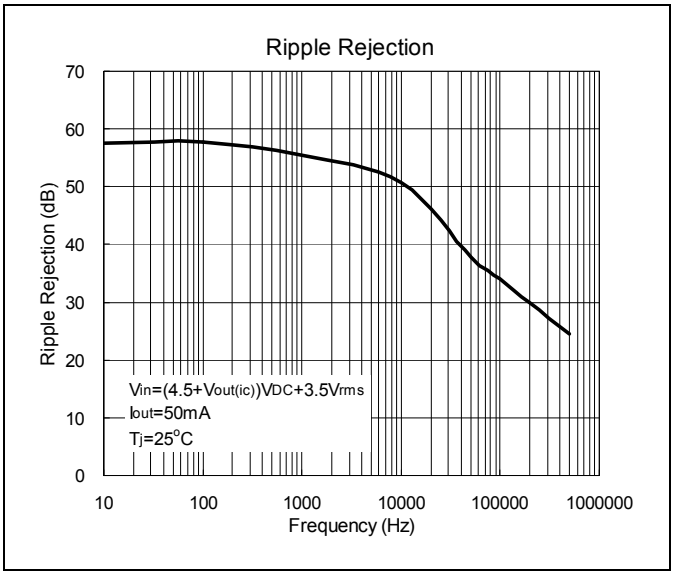
Parameter	Symbol	Conditions	RS7805E			Units
			Min.	Typ.	Max.	
Output Voltage	V_O	T_J=25°C, I_{OUT}=500mA	4.85	5	5.15	V
		5mA≤I_{OUT}≤1A	4.85	5	5.15	
		7V≤V_{IN}≤25V, P_{OUT}≤15W				
Line Regulation	ΔV_O	T_J=25°C, 7V≤V_{IN}≤25V	-	3	50	mV
		T_J=25°C, 8V≤V_{IN}≤12V	-	1	25	
Load Regulation	ΔV_O	T_J=25°C, 5mA≤I_{OUT}≤1A	-	15	100	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	5	50	
Quiescent Current	I_B	I_{OUT}=5mA, T_J=25°C	-	3.9	8	mA
Quiescent Current Change	ΔI_B	I_{OUT}=500mA, 7V≤V_{IN}≤25V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=10V, T_J=25°C	-	-	0.5	
Output Noise Voltage	eN	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	50	-	uV/V_O
Ripple Rejection	RR	10V≤V_{IN}≤18V, f=120Hz, I_{OUT}=50mA, T_J=25°C	57	73	-	dB
Dropout Voltage	V_D	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
Output Resistance	R_O	f=1KHz	-	17	-	mΩ
Short Circuit Current	I_{SC}	T_J=25°C	-	2.3	2.8	A
Output Voltage Drift	$\Delta V_O/\Delta T$	0°C≤T_J≤125°C	-	-	0.6	mV/°C

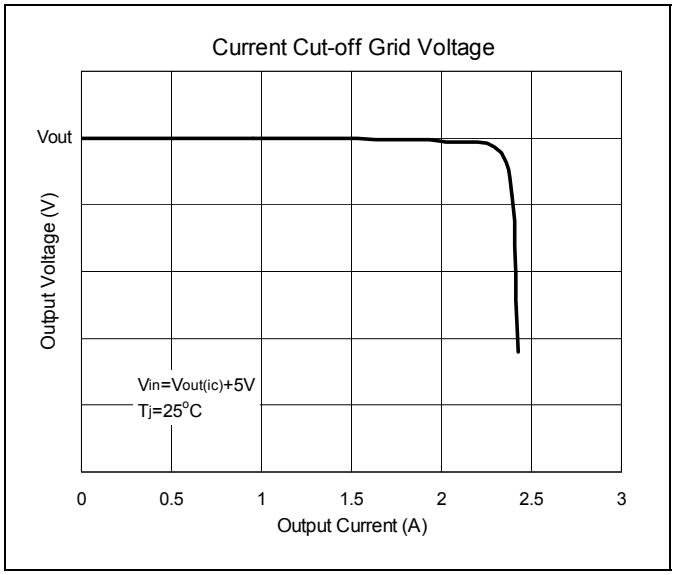
RS7812 SERIES ELECTRICAL CHARACTERISTICS

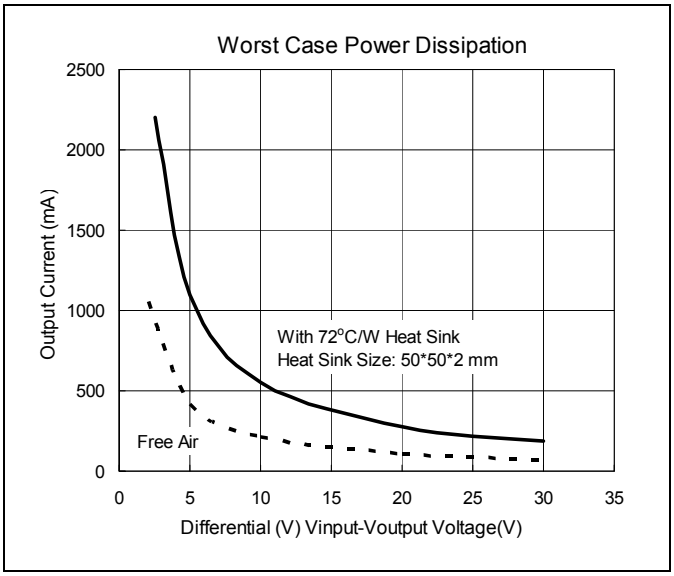
V_{IN}=19V, I_{OUT}=500mA, C_{IN}=0.33uF, C_{OUT}=0.1uF, 0°C≤T_J≤125°C (unless otherwise specified)

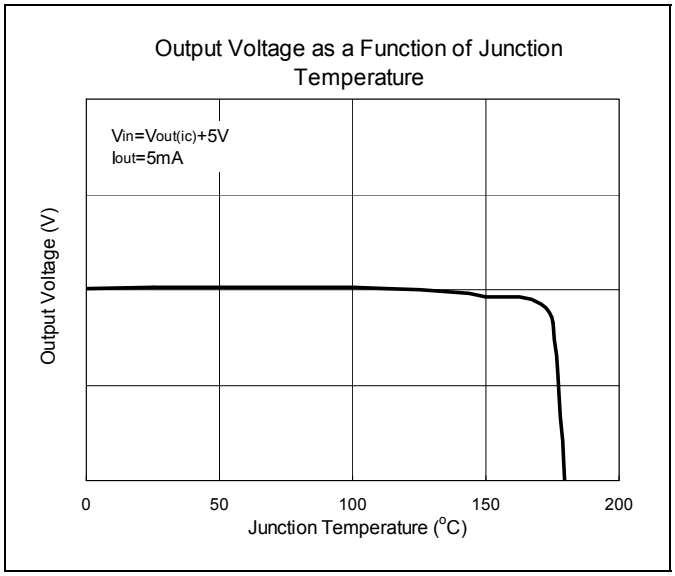
Parameter	Symbol	Conditions	RS7812E			Units
			Min.	Typ.	Max.	
Output Voltage	V_O	T_J=25°C, I_{OUT}=500mA	11.64	12	12.36	V
		5mA≤I_{OUT}≤1A	11.64	12	12.36	
		14V≤V_{IN}≤30V, P_{OUT}≤15W				
Line Regulation	ΔV_O	T_J=25°C, 14.5V≤V_{IN}≤30V	-	10	120	mV
		T_J=25°C, 16V≤V_{IN}≤22V	-	3	60	
Load Regulation	ΔV_O	T_J=25°C, 5mA≤I_{OUT}≤1A	-	12	100	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	4	60	
Quiescent Current	I_B	I_{OUT}=5mA, T_j=25°C	-	3.9	8	mA
Quiescent Current Change	ΔI_B	I_{OUT}=500mA, 14.5V≤V_{IN}≤30V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=19V, T_J=25°C	-	-	0.5	
Output Noise Voltage	eN	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	-	90	uV/V_O
Ripple Rejection	RR	19V≤V_{IN}≤25V, f=120Hz, I_{OUT}=50mA, T_J=25°C	50	66	-	dB
Dropout Voltage	V_D	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
Output Resistance	R_O	f=1KHz	-	18	-	mΩ
Short Circuit Current	I_{SC}	T_J=25°C	-	2.3	2.8	A
Output Voltage Drift	$\Delta V_O/\Delta T$	0°C≤T_J≤125°C	-	-	1.6	mV/°C

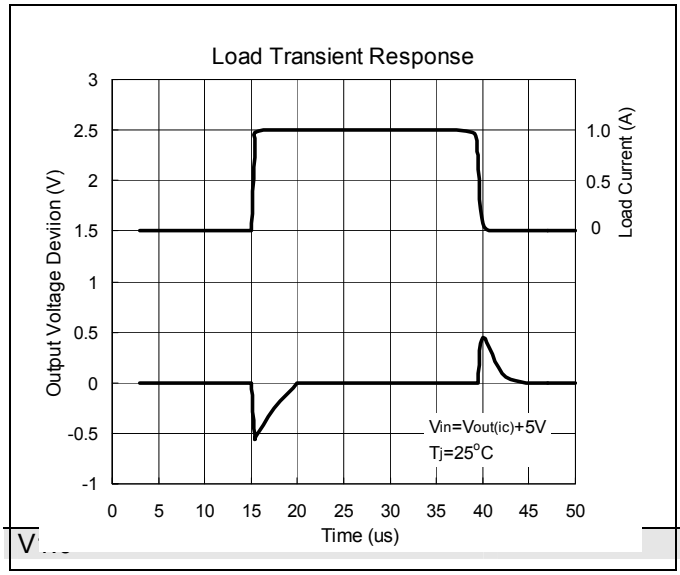
CHARACTERISTICS CURVE

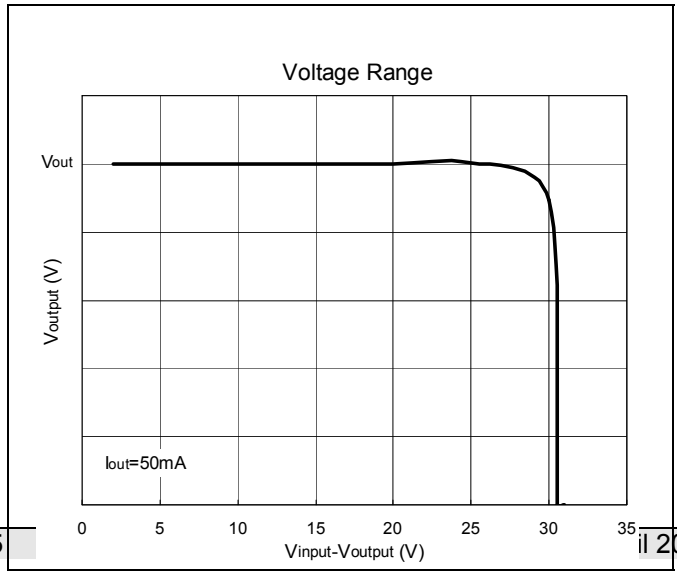






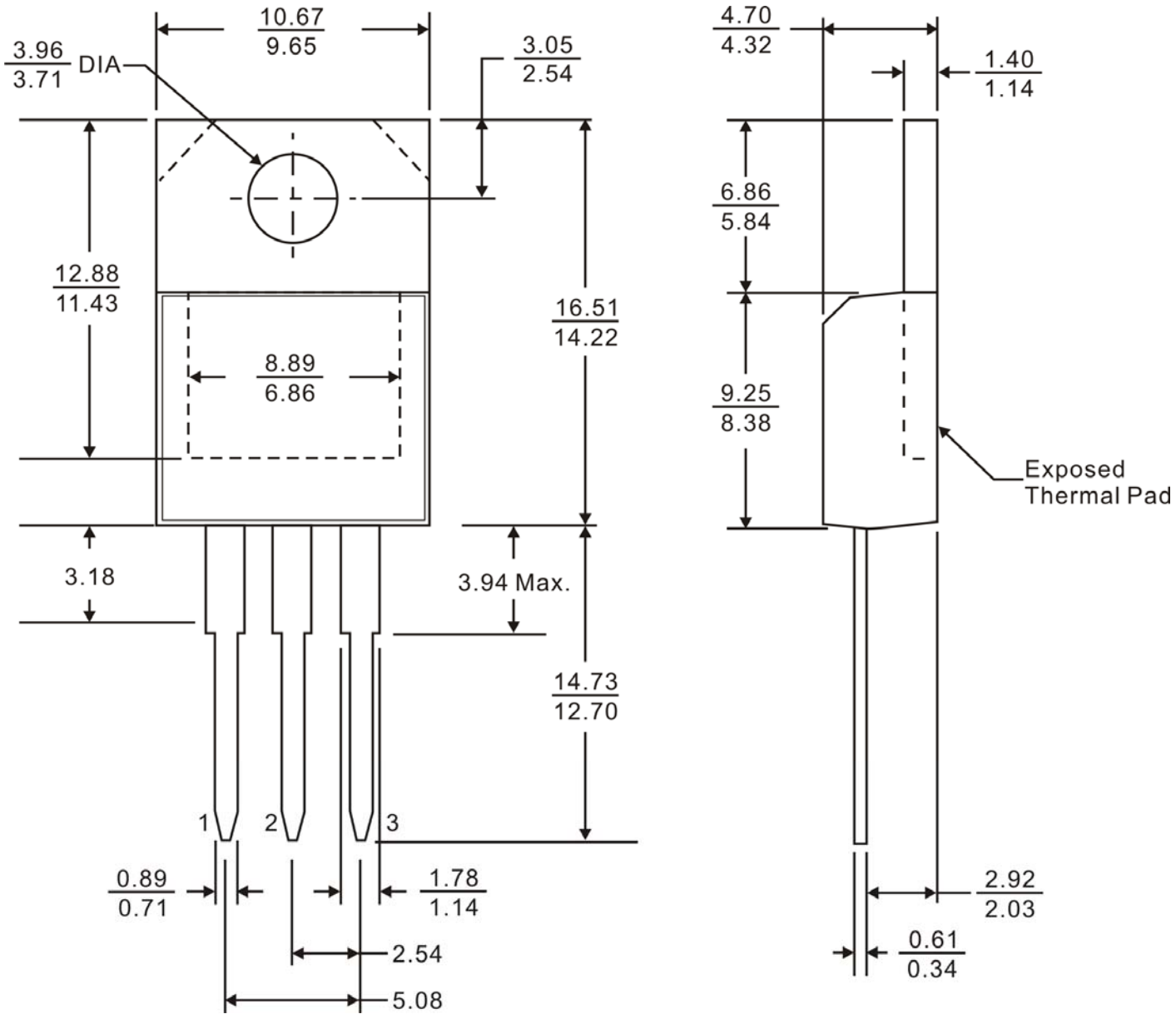






PACKAGE INFORMATION

TO-220-3



Notes:
1. Refer to JEDEC TO-220 AB.
2. All dimensions are in millimeter.

IMPORTANT NOTICE

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