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June 2014

KA78RH33R
Low Dropout Voltage Regulator

Features

- Fixed Output Voltage of +3.3 V
- Space-Saving SMD Types of DPAK
- 1 V (Typical) Dropout at I_O = 800 mA
- Output Current: 800 mA
- Thermal Shutdown Protection
- Over-Current Protection
- Output Trimmed to ±1% Tolerance
- No Minimum Load Requirement

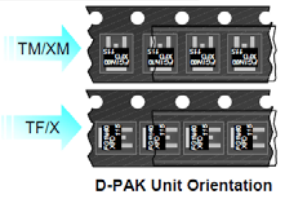
Description

The KA78RH33 is a +3.3V, fixed, low dropout voltage regulator specifically designed for use in low-voltage operation. The maximum load current is 0.8 A and the dropout voltage is guaranteed to be 1 V (typical). The dropout voltage varies with load current. The regulator consists of composite PNP-NPN pass transistors.

D-PAK

1

1. GND 2. V_{OUT} 3.V_{IN}



D-PAK Unit Orientation

Ordering Information

Part Number	Operating Temperature Range	Top Mark	Package	Packing Method
KA78RH33RTF	-25°C to +125°C	KA78RH33	TO-252 3L (DPAK)	Tape and Reel
KA78RH33RTM	-25°C to +125°C	KA78RH33	TO-252 3L (DPAK)	Tape and Reel

* Refer to above unit orientation figure for TM / TF suffix packing.

Block Diagram

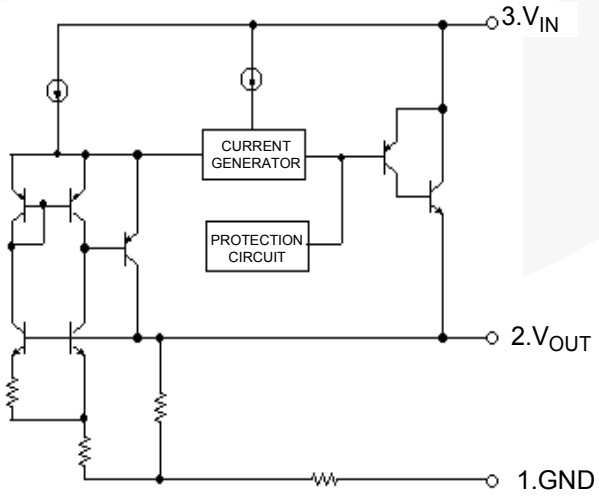


Figure 1. Block Diagram

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{IN}	Power Supply Input Voltage	15	V
I_O	Output Load Current	800	mA
T_J	Junction Temperature	150	°C
T_{OPR}	Operating Junction Temperature	-25 to 125	°C
T_{STG}	Storage Temperature	-55 to 150	°C

Temperature Characteristics

Symbol	Parameter	Value	Unit
$\Delta V_O / \Delta T$	Temperature Coefficient of Output Voltage	±0.02	%/ °C

Thermal Characteristics

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	110	°C/W

Electrical Characteristics

Refer to the test circuit, values are at V_{IN} = 5 V, C_O = 10 µF, and T_A = 25°C,unless otherwise specified.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{OUT}	Output Voltage	I_O = 10 mA, T_J = 25°C	3.27	3.30	3.33	V
V_{OUT}	Output Voltage	V_{IN} = 4.8 V to 12 V, I_O = 10 mA to 800 mA, T_J = -25°C to 125°C	3.23	3.30	3.37	V
R_{line}	Line Regulation	V_{IN} = 4.8 V to 12 V, I_O = 10 mA		1	10	mV
R_{load}	Load Regulation	I_O = 10 mA to 800 mA		1	20	mV
RR	Ripple Rejection	f = 120 Hz, I_O = 500 mA, V_{IN} = 6.3 ± 1 Vrms	55			dB
V_{drop}	Dropout Voltage	I_O = 100 mA		1.00	1.20	V
		I_O = 500 mA		1.05	1.25	
		I_O = 800 mA		1.10	1.40	
I_q	Quiescent Current	V_{IN} ≤ 12 V		5	10	mA
$\Delta V_O / \Delta T$	Temperature Coefficient of Output Voltage	T_J = -25°C to 125°C, I_O = 10 mA		0.2		mV/°C
I_{pk}	Peak Output Current	V_{IN} = 6.3 V	800			mA
V_n	Output Noise Voltage	f = 10 Hz to 10 kHz		100		µVrms

Typical Application

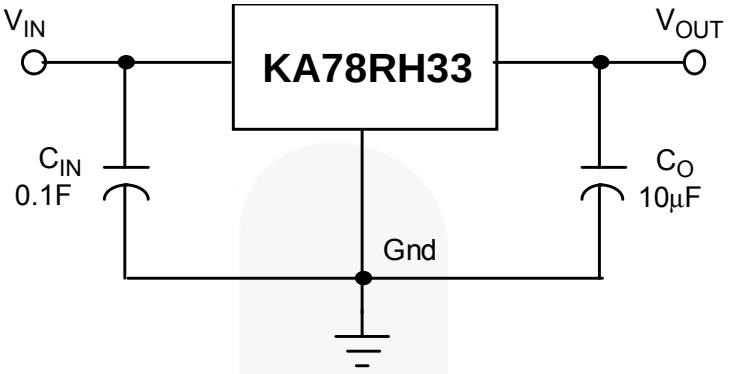


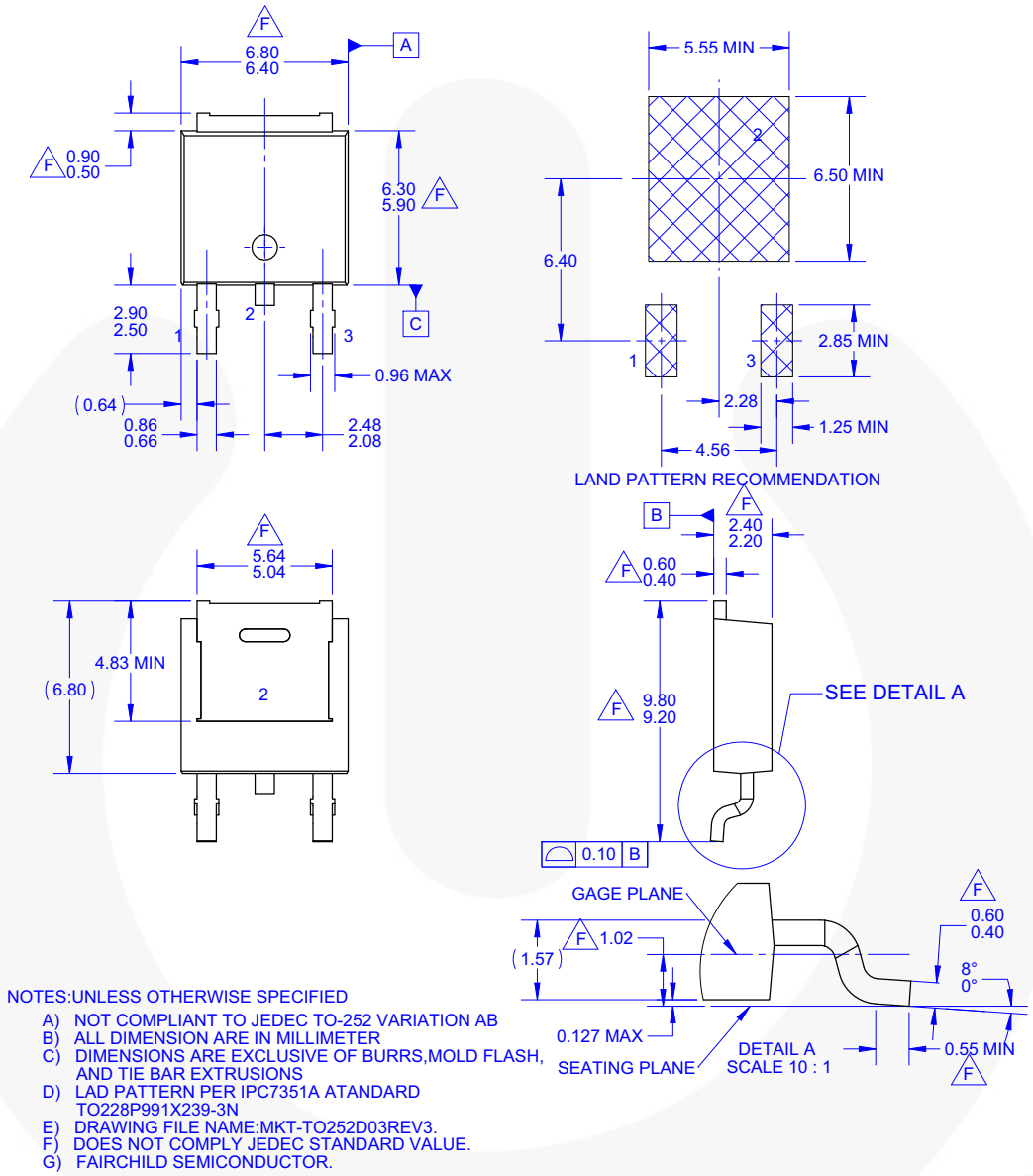
Figure 2. Typical Application(1)

Note:

1. An input capacitor, C_{IN} is not necessary for stability, but improves the overall performance.

Physical Dimensions

TO-252 3L (DPAK)



NOTES:UNLESS OTHERWISE SPECIFIED

A) NOT COMPLIANT TO JEDEC TO-252 VARIATION AB
B) ALL DIMENSION ARE IN MILLIMETER
C) DIMENSIONS ARE EXCLUSIVE OF BURRS,MOLD FLASH, AND TIE BAR EXTRUSIONS
D) LAD PATTERN PER IPC7351A ATANDARD TO228P991X239-3N
E) DRAWING FILE NAME:MKT-TO252D03REV3.
F) DOES NOT COMPLY JEDEC STANDARD VALUE.
G) FAIRCHILD SEMICONDUCTOR.

Figure 3. 3-Lead, TO-252, JEDEC TO-252 VAR. AB, SURFACE MOUNT (DPAK)

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No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
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