

### GENERAL DESCRIPTION

The CM2862 family is a positive voltage linear regulator developed utilizing CMOS technology featured low quiescent current (30 $\mu$ A typ.), low dropout voltage, and high output voltage accuracy. Built-in low on-resistance transistor provides low dropout voltage and large output current. A 2.2 $\mu$ F or greater can be used as an output capacitor.

The SOT-89 packages are attractive for "Pocket" and "Hand Held" applications.

These robust devices are designed to prevent device failure under the worst operation condition with both Thermal Shutdown and Current Fold-back.

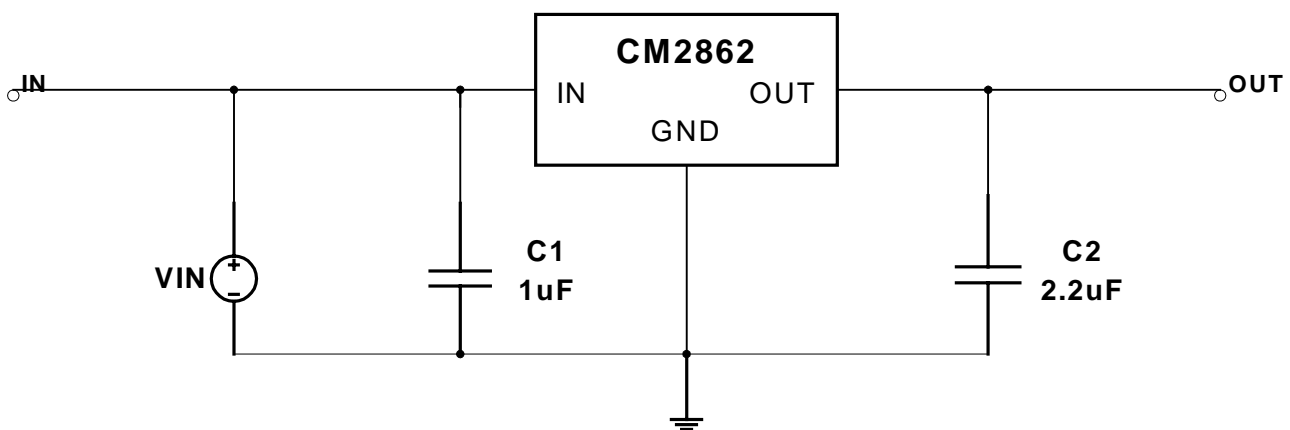
### FEATURES

- ◆ Very Low Dropout Voltage
- ◆ Low Current Consumption: Typ. 30 $\mu$ A, Max. 35 $\mu$ A
- ◆ High Accuracy Output Voltage: +/- 1.5%
- ◆ Guaranteed 600mA Output
- ◆ Thermal Shutdown
- ◆ Current Limiting
- ◆ Compact Package: SOT-89
- ◆ Factory Pre-set Output Voltages
- ◆ Short Circuit Current Fold-Back
- ◆ Low Temperature Coefficient

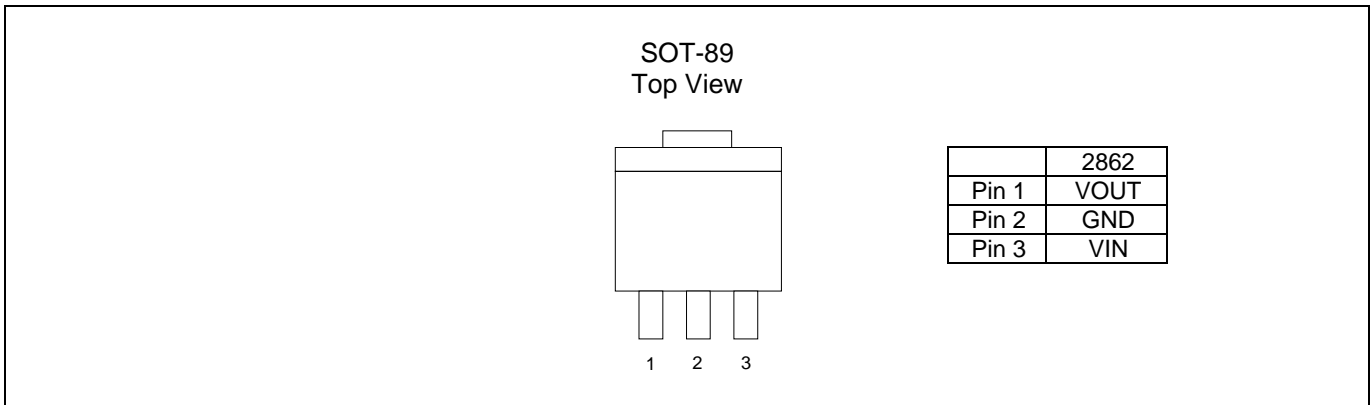
### APPLICATIONS

- ◆ Battery-powered devices
- ◆ Personal communication devices
- ◆ Home electric/electronic appliances
- ◆ PC peripherals

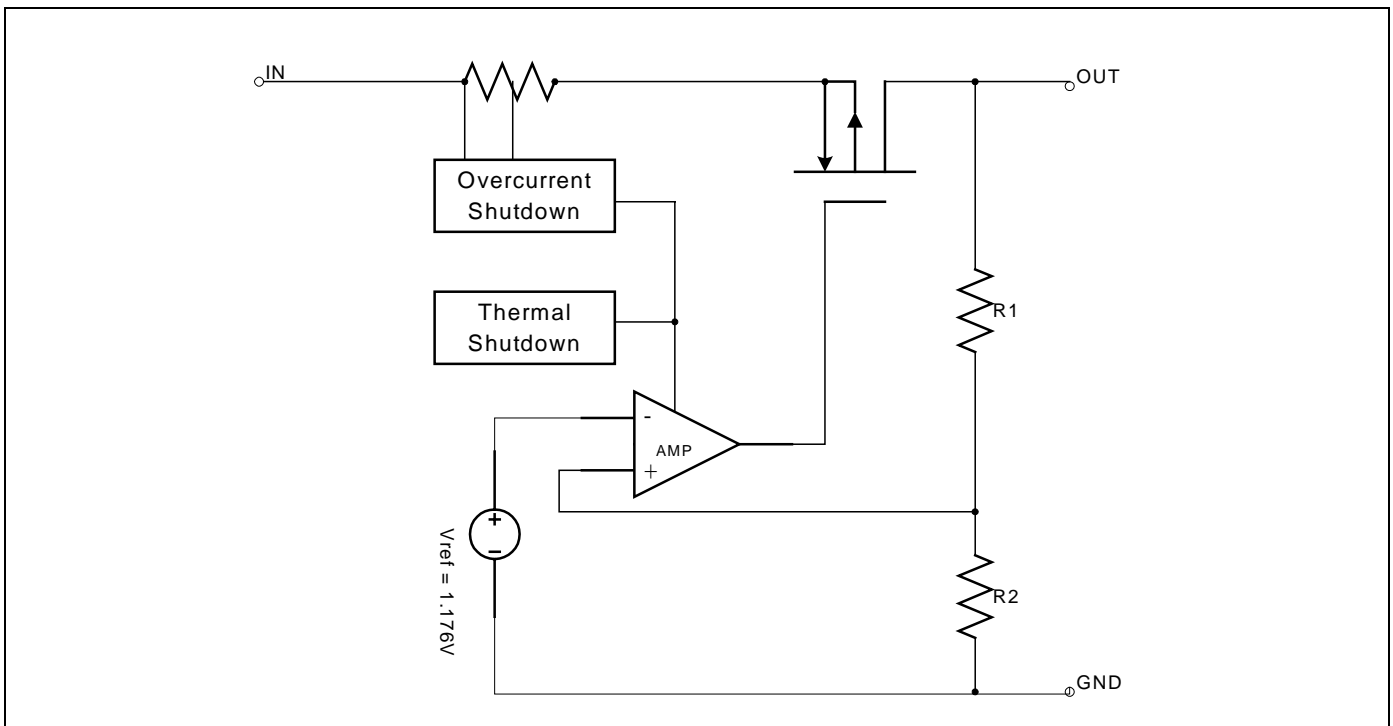
### TYPICAL APPLICATIONS



### PIN CONFIGURATION



### BLOCK DIAGRAM



### ORDERING INFORMATION

Part Number	Output Voltage	Temperature Range	Package
CM2862KIM89	2.5V	-40°C ~ +85°C	SOT-89
CM2862SIM89	3.3V	-40°C ~ +85°C	SOT-89

**Note:** For other pre-set output voltage, please contact Champion Sales office.

### ABSOLUTE MAXIMUM RATINGS

Input Voltage ..... +7V  
 Output Current ..... 1A  
 Output Voltage ..... GND-0.3V to  $V_{IN}+0.3V$   
 ESD Classification ..... B

### OPERATING RATINGS

Supply Voltage ..... 4.5V to 5.5V  
 Ambient Temperature Range ( $T_A$ ) ..... -40°C to +85°C  
 Junction Temperature Range ..... -40°C to +125°C

### THERMAL INFORMATION

Parameter		Maximum	Unit
Thermal Resistance ( $\theta_{jc}$ )	SOT-89	100	°C/W
Thermal Resistance ( $\theta_{ja}$ )	SOT-89	180	°C/W
Internal Power Dissipation ( $P_D$ ) ( $\Delta T = 100^\circ C$ , No Heatsink)	SOT-89	400	mW
Maximum Junction Temperature		150	°C
Maximum Lead Temperature (10 Sec)		300	°C

### ELECTRICAL CHARACTERISTICS

$T_A = +25^\circ C$ ;  $V_{IN} = V_{IN(MIN)}$  unless otherwise noted

Parameter	Symbol	Test Conditions	CM2862			Unit
			Min.	Typ.	Max.	
Input Voltage	$V_{IN}$		Note 1		7	V
Output Voltage Accuracy	$V_{OUT}$	$I_O = 1mA$	-1.5		1.5	%
Dropout Voltage	$V_{DROPOUT}$	$I_O = 600mA$ , $V_{OUT} = V_{O(NOM)} - 1.5%$	$1.5V < V_{O(NOM)} \leq 2.0V$		1000	mV
			$2.0V < V_{O(NOM)} \leq 2.8V$		800	mV
			$2.8V < V_{O(NOM)} < 3.8V$		600	mV
Output Current	$I_O$	$V_{OUT} > 1.2V$	600			mA
Current Limit	$I_{LIM}$	$V_{OUT} > 1.2V$ , $V_{IN} = V_{IN(MIN)}$	600	1000		mA
Short Circuit Current	$I_{SC}$	$V_{OUT} < 0.8V$		250		mA
Quiescent Current	$I_Q$	$I_O = 0mA$		30	50	$\mu A$
Ground Pin Current	$I_{GND}$	$I_O = 1mA$ to 600mA		30	50	$\mu A$
Line Regulation	$REG_{LINE}$	$I_{OUT} = 5mA$ , $V_{IN} = V_{OUT} + 1$ to $V_{OUT} + 2$	$V_{OUT} \leq 2.0V$		0.15	%
			$V_{OUT} > 2.0V$		0.02	0.1
Load Regulation	$REG_{LOAD}$	$I_O = 1mA$ to 600mA		0.2	1	%
Over Temperature Shutdown	OTS			150		°C
Over Temperature Hystersis	OTH			30		°C
$V_{OUT}$ Temperature Coefficient	TC			30		ppm/°C
Power Supply Rejection	PSRR	$I_O = 100mA$ $C_O = 2.2\mu F$ ceramic	$f = 1kHz$		50	dB
			$f = 10kHz$		20	
			$f = 100kHz$		15	
Output Voltage Noise	eN	$f = 10Hz$ to 100kHz $I_O = 10mA$ , $C_{VBG} = 0\mu F$	$C_O = 2.2\mu F$		30	$\mu V_{rms}$
			$C_O = 100\mu F$		20	

**Note 1.**  $V_{IN(MIN)} = V_{OUT} + V_{DROPOUT}$

**Note 2.** As  $V_{IN}$  is larger than  $V_{IN(MIN)}$ , the Current Limit and output short current Spec value will increase

## DETAILED DESCRIPTION

The CM2862 family of CMOS regulators contain a PMOS pass transistor, voltage reference, error amplifier, over-current protection, thermal shutdown, and short circuit protection.

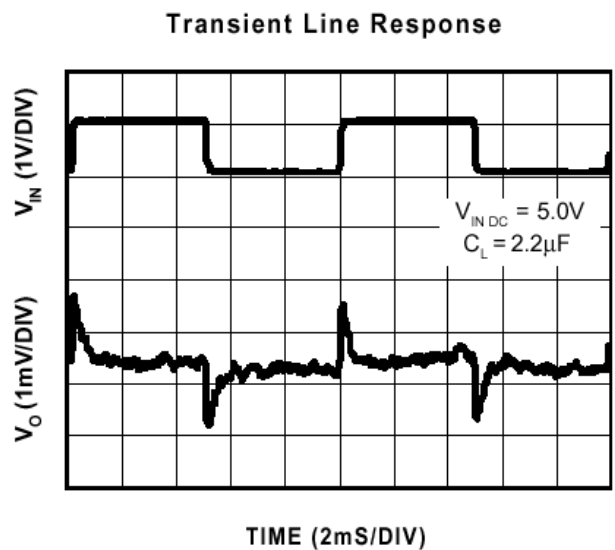
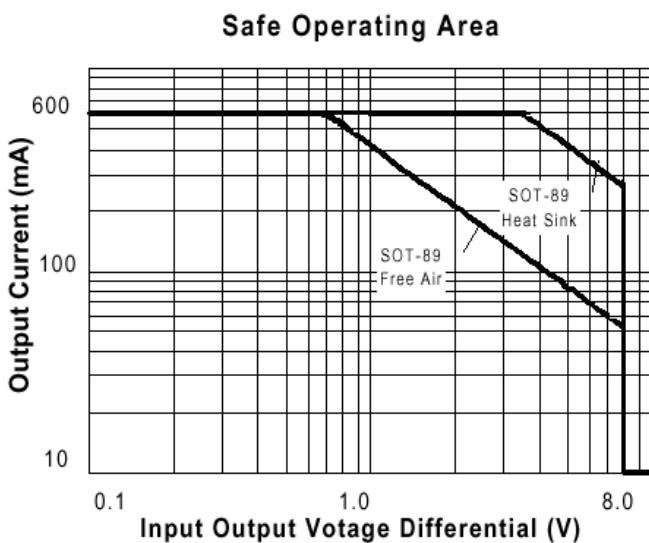
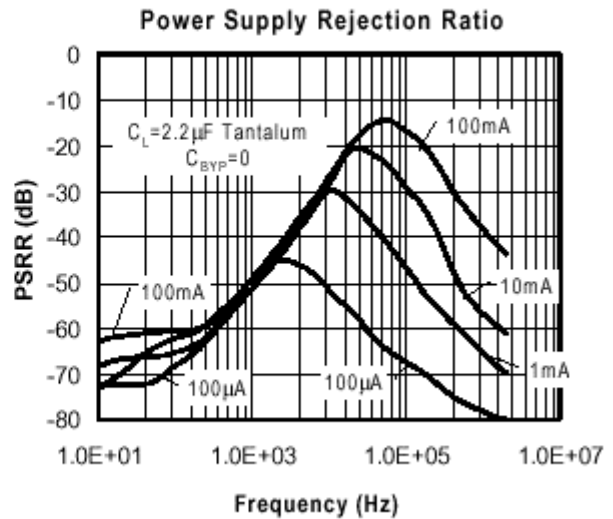
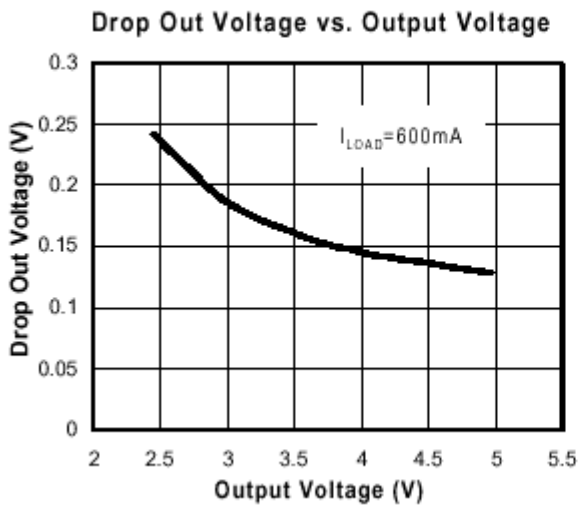
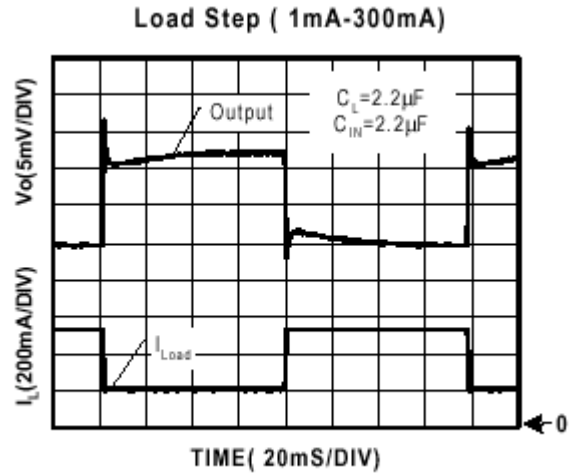
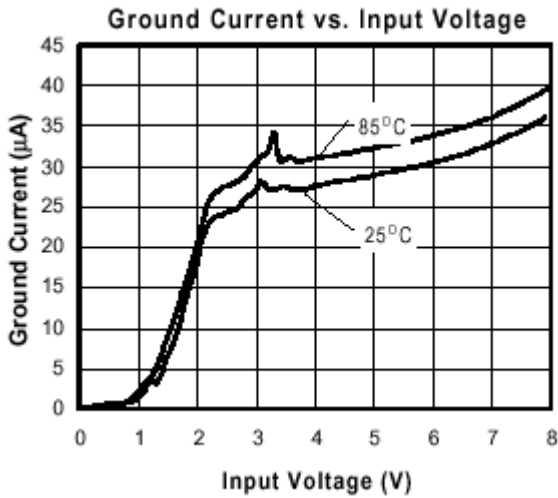
The P-channel pass transistor receives data from the error amplifier, over-current shutdown, short output protection, and thermal protection circuits. During normal operation, the error amplifier compares the output voltage to a precision reference. Over-current and Thermal shutdown circuits become active when the junction temperature exceeds 150°C, or the current exceeds 600mA. During thermal shutdown, the output voltage remains low. Normal operation is restored when the junction temperature drops below 120°C.

The CM2862 switches from voltage mode to current mode when the load exceeds the rated output current. This prevents over-stress. The CM2862 also incorporates current fold-back to reduce power dissipation when the output is short-circuited. This feature becomes active when the output drops below 0.8V, and reduces the current flow by 65%. Full current is restored when the voltage exceeds 0.8V.

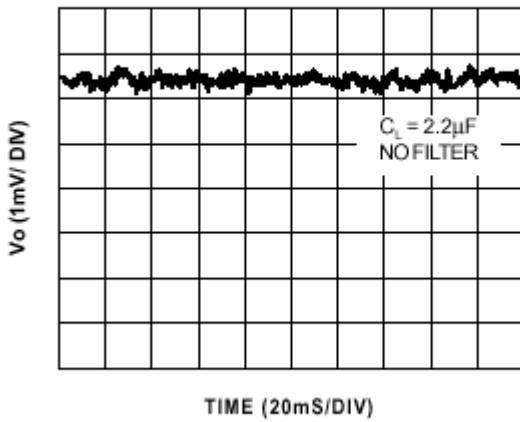
## EXTERNAL CAPACITOR

The CM2862 is stable with an output capacitor to ground of 2.2 $\mu$ F or greater. It can keep stable even with higher or poor ESR capacitors. A second capacitor is recommended between the input and ground to stabilize VIN. The input capacitor should be larger than 0.1 $\mu$ F to have a beneficial effect. All capacitors should be placed in close proximity to the pins. A "quiet" ground termination is desirable.

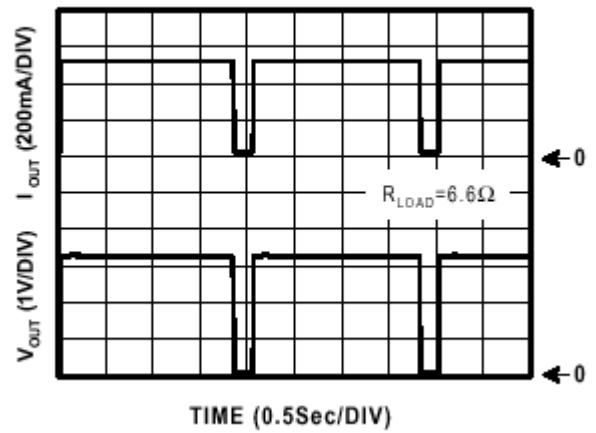
### TYPICAL ELECTRICAL CHARACTERISTICS



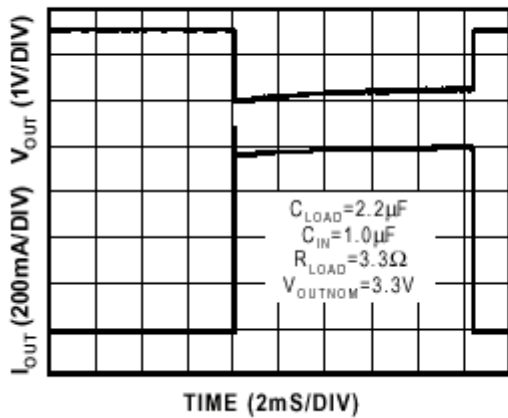
**Noise Measurement**



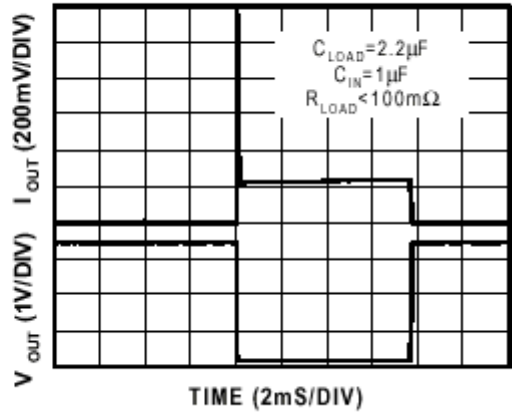
**Overtemperature Shutdown**



**Current Limit Response**

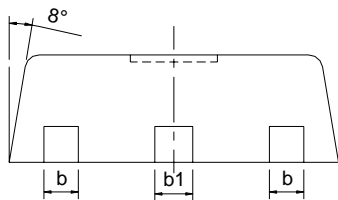
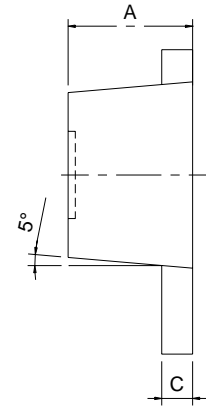
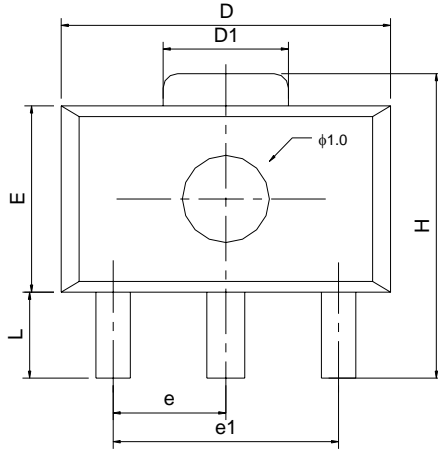


**Short Circuit Response**



**PACKAGE DIMENSION**

**SOT-89 (M89)**



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.40	1.50	1.60	0.055	0.059	0.063
L	0.80	---	1.20	0.031	---	0.047
b	0.36	0.42	0.48	0.014	0.016	0.018
b1	0.41	0.47	0.53	0.016	0.018	0.020
C	0.38	0.40	0.43	0.014	0.015	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.40	1.60	1.75	0.055	0.062	0.069
H	3.94	---	4.25	0.155	---	0.167
E	2.40	2.50	2.60	0.094	0.098	0.102
e1	2.90	3.00	3.10	0.114	0.118	0.122
e	1.45	1.50	1.55	0.057	0.059	0.061

**NUMBERING SCHEME****Ordering Number: CM2862XYZ (note1)****note1:**

CM2862: 600mA CMOS LDO

X : Suffix for voltage output (note 2)Y : Suffix for Temperature Range (note 3)Z : Suffix for Package Type (note 4)**note 2:** see CMOS LDO Voltage Suffix Table**note 3:**

Y= I : -40°C~+85°C (only I grade support for all CMOS LDOs)

**note 4:**

Z is single alphabet with or without digits

M89 : SOT-89 (TR only)

**CMOS LDO Voltage Suffix Table**

Output Voltage	Suffix	Output Voltage	Suffix
1.5V	A	3.0V	P
1.6V	B	3.1V	Q
1.7V	C	3.2V	R
1.8V	D	3.3V	S
1.9V	E	3.4V	T
2.0V	F	3.5V	U
2.1V	G	3.6V	V
2.2V	H	3.7V	W
2.3V	I	3.8V	X
2.4V	J	3.9V	Y
2.5V	K	4.0V	Z
2.6V	L		
2.7V	M		
2.8V	N		
2.9V	O		



## IMPORTANT NOTICE

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