



GENERAL DESCRIPTION

The EC8733 series is a high accuracy, high input voltage low quiescent current, high speed, and low dropout liner regulator with high ripple rejection. The input voltage is up to 40V and load current is up to 300mA at $V_{OUT} = 5V$ & $V_{IN} = 7V$. The device is manufactured with BCD process. The EC8733 offers over-current limit and over temperature protection to ensure the device working in well conditions.

The EC8733 regulators is available in standard SOT89-3L, SOT23-5L and SOT23-3L packages. Standard products are Pb-free and Halogen-free.

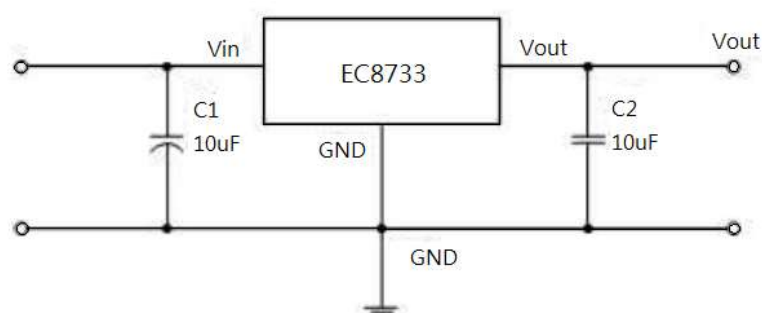
Features

- Input voltage: 4.75V~40V
- Output voltage: 1.8V~5.7V
- Output accuracy: $< \pm 2\%$
- Output current: 150mA (Up to 500mA Typ)
Up to 300mA @ $V_{IN} = 7V$, $V_{OUT} = 5V$,
- PSRR: 60dB @ 100Hz
- Dropout voltage: 600mV @ $I_{OUT} = 100mA$
- Quiescent current: 4 μA @ $V_{IN} = 12V$ (Typ.)
- ESD HBM: 8KV
- Recommend capacitor: 10 μF

Applications

- Smart electric meter
- In-car entertainment
- Electric bicycle

Typical Application Circuit

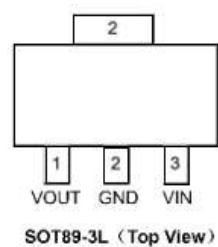


PIN ASSIGNMENT



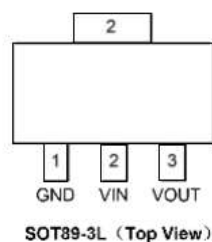
EC8733B6A

SOT89-3L



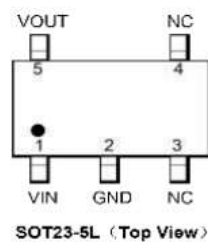
EC8733B6B

SOT89-3L



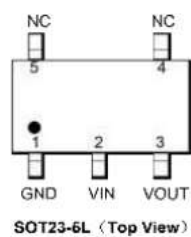
EC8733B2A

SOT23-5L



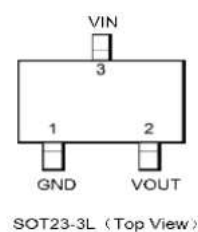
EC8733B2B

SOT23-5L



EC8733B1

SOT23-3L



**PIN DESCRIPTION**

PIN NO	SYMBOL	I/O	DESCRIPTION
EC8733B6A			
1	VOUT	O	Output
2	GND	Ground	Ground
3	VIN	Power	Input

PIN NO	SYMBOL	I/O	DESCRIPTION
EC8733B6B			
1	GND	Ground	Ground
2	VIN	Power	Input
3	VOUT	O	Output

PIN NO	SYMBOL	I/O	DESCRIPTION
EC8733B2A			
1	VIN	Power	Input
2	GND	Ground	Ground
3	NC	-	Not connect
4	NC	-	Not connect
5	VOUT	O	Output

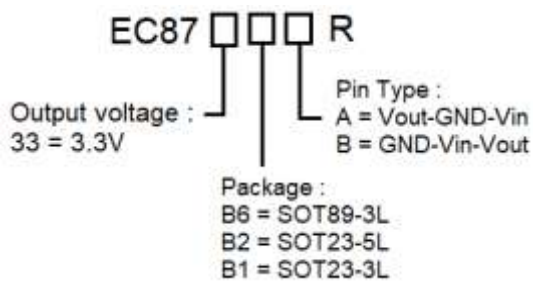
PIN NO	SYMBOL	I/O	DESCRIPTION
EC8733B2B			
1	GND	Ground	Ground
2	VIN	Power	Input
3	VOUT	O	Output
4	NC	-	Not connect
5	NC	-	Not connect

PIN NO	SYMBOL	I/O	DESCRIPTION
EC8733B1			
1	GND	Ground	Ground
2	VOUT	O	Output
3	VIN	Power	Input

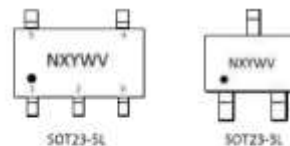
ORDERING INFORMATION

PART NO	PACAKGE	TEMPERATURE	TAPE & REEL
EC8733B6AR	SOT89-3L	-40 ~ +105 °C	1000/REEL
EC8733B6BR	SOT89-3L	-40 ~ +105 °C	1000/REEL
EC8733B2AR	SOT23-5L	-40 ~ +105 °C	3000/REEL
EC8733B2BR	SOT23-5L	-40 ~ +105 °C	3000/REEL
EC8733B1R	SOT23-3L	-40 ~ +105 °C	3000/REEL

PART NUMBER RULES



MARKING DESCRIPTION



"N": product code, "Q" stands for "EC8733B1R "

"Q" stands for "EC8733B2AR"

"P" stands for "EC8733B2BR "

"X": Package factory.

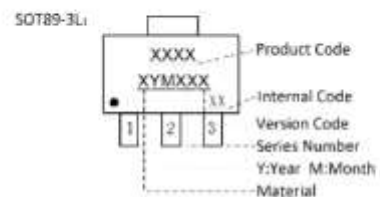
"Y": Wafer foundry vendor.

"W": The week of manufacturing. "A" stands for week

1, "Z" stands for week 26, "A" stands for week

27, "Z" stands for week.

"V": Version code.





ABSOLUTE MAXIMUM RATINGS (Note)

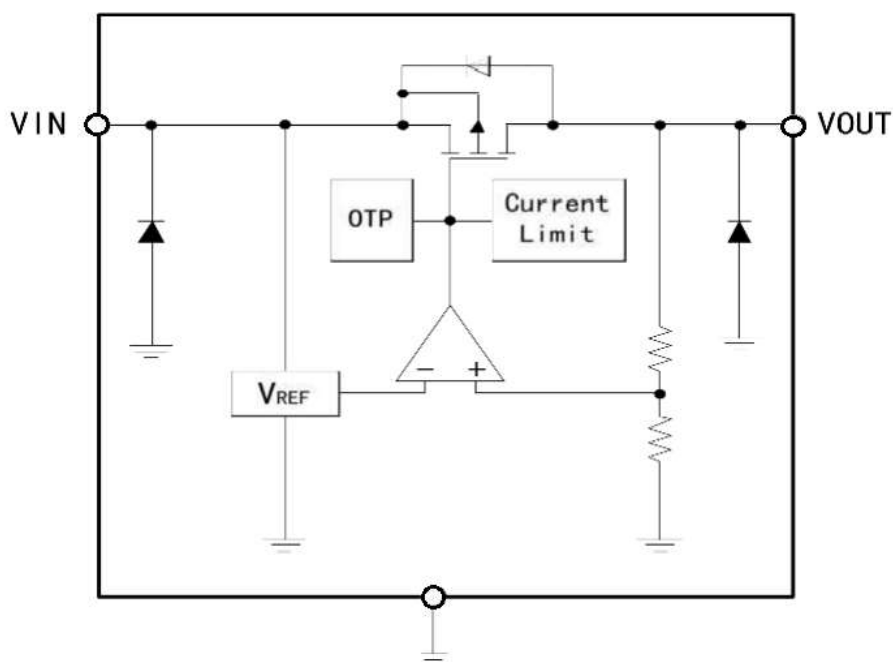
SYMBOL	ITEMS	VALUE	UNIT
V_{IN}	Input Voltage	-0.3~45	V
V_{OUT}	Output Voltage	-0.3~6.5	V
P_{DMAX}	Power Dissipation	OTP limited	W
T_J	Junction Temperature	-40~150	°C
T_{stg}	Storage Temperature	-55 to 150	°C
T_{solder}	Package Lead Soldering Temperature (10s)	260	°C
ESD MM	Machine Mode	200	V
ESD HBM	Human Body Mode	8000	V

Note: Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.

RECOMMENDED OPERATING RANGE

SYMBOL	ITEMS	VALUE	UNIT
V_{IN}	V_{IN} Supply Voltage	4.75 to 40	V
$R_{\theta JA}$	Thermal Resistance on PCB	45	°C/W
T_{OPT}	Operating Temperature	-40 to +105	°C

SIMPLIFIED BLOCK DIAGRAM



**ELECTRICAL CHARACTERISTICS**

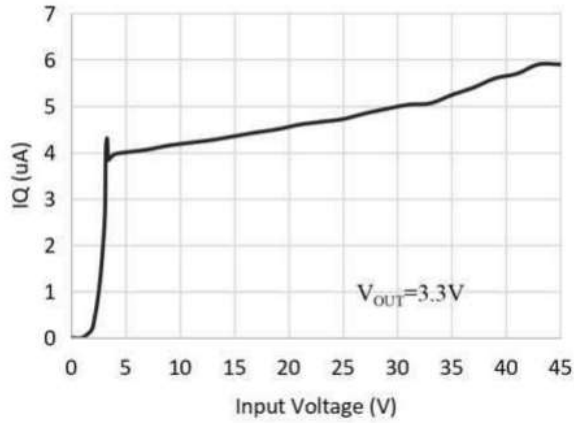
The following specifications apply for $V_{IN} = 12V$, $T_A = 25^\circ C$, $C_{IN} = C_{OUT} = 10\mu F$, unless specified otherwise.

SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}	Input Range	$I_{OUT} = 10mA$	4.75		40	V
V_{OUT}	Output Range	$I_{OUT} = 10mA$	$V_{OUT} \times 0.98$	V_{OUT}	$V_{OUT} \times 1.02$	V
ΔV_{OUT}	Output Voltage	$V_{IN} = 12V, I_{OUT} = 10mA$	4.9	5	5.1	V
			3.234	3.3	3.366	
			2.94	3.0	3.06	
I_Q	Quiescent Current	$V_{IN} = 7V, I_{OUT} = 0$		3.9	6	μA
		$V_{IN} = 24V, I_{OUT} = 0$		4.5	6.7	
		$V_{IN} = 40V, I_{OUT} = 0$		5.4	8.2	
I_{OUT_PK}	Maximum Output Current	$V_{IN} - V_{OUT} = 4V, R_L = 1\Omega$		500	550	mA
V_{DROP}	Dropout Voltage	$I_{OUT} = 10mA$		60	90	mV
		$I_{OUT} = 100mA$		600	900	
ΔV_{LINE}	Line Regulation	$V_{IN} = 7 \sim 24V, V_{OUT} = 5V, I_{OUT} = 1mA$		0.02	0.03	%/V
		$V_{IN} = 7 \sim 45V, V_{OUT} = 5V, I_{OUT} = 1mA$		0.08	0.1	
ΔV_{LOAD}	Load Regulation	$V_{IN} = 7V, I_{OUT} = 1 \sim 100mA$		19	37	mV
I_{SHORT}	Short Current	V_{OUT} Short to GND with 1Ω (1ms pulse), $V_{IN} = 12V$		180		mA
PSRR	Power Supply Rejection Rate	$V_{IN} = 10V,$ $V_{PP} = 0.5V,$ $I_{OUT} = 1mA$	$F = 100Hz$	60		dB
			$F = 1kHz$	50		
			$F = 10kHz$	40		
e_{NO}	Output Noise Voltage	10Hz to 100kHz, $C_{OUT} = 10\mu F,$ $I_{OUT} = 10mA$		± 100		μV_{RMS}
T_{SD}	Thermal Shutdown Protection	$V_{IN} = 12V, I_{OUT} = 1mA$		165		$^\circ C$
$\Delta V_O / \Delta T$	Temperature Coefficient			± 0.5		mV/ $^\circ C$

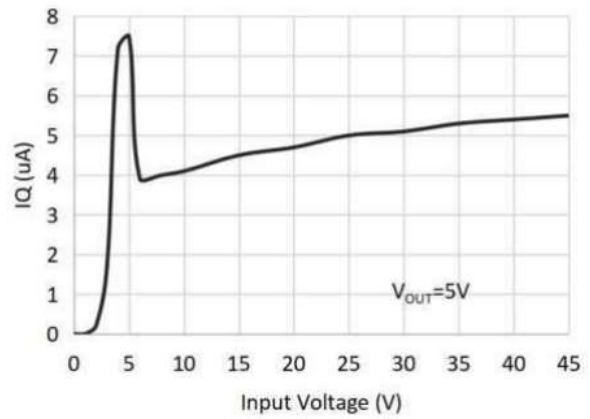
**TYPICAL PERFORMANCE CHARACTERISTICS**

$C_{IN} = 10\mu F$, $C_{OUT} = 10\mu F$, $T_{OPT} = 25^{\circ}C$, unless specified otherwise. (EC8733B6A Package)

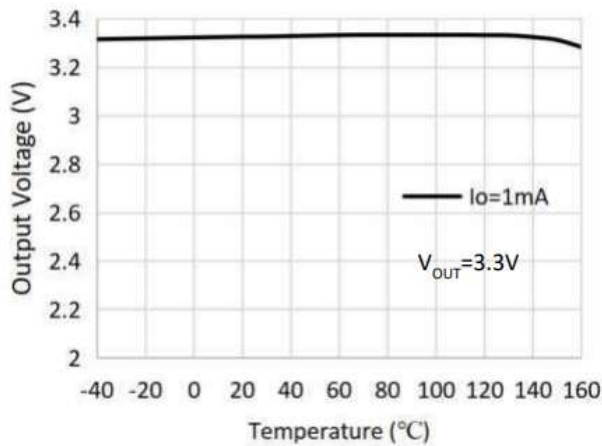
IQ vs. Input Voltage



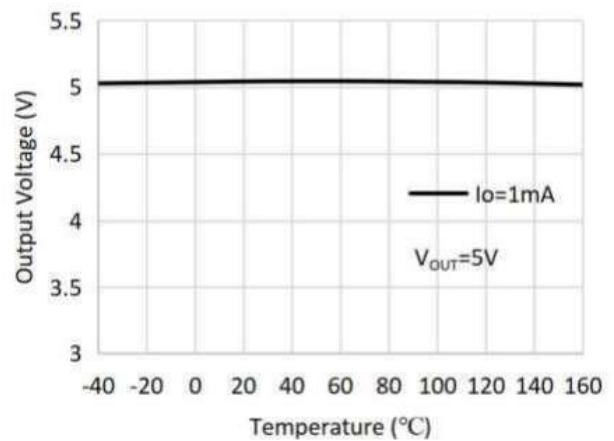
IQ vs. Input Voltage



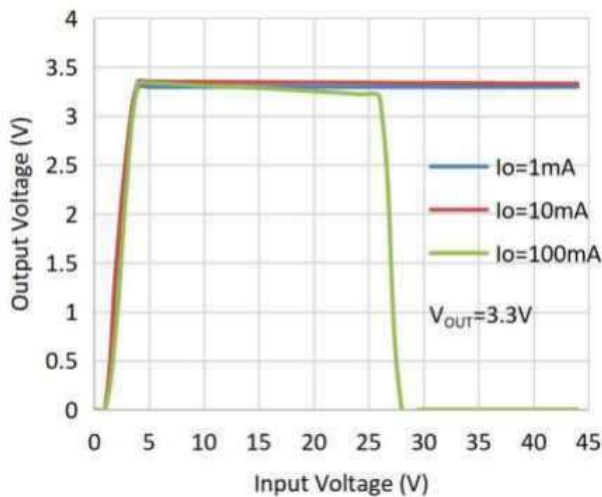
Output Voltage vs. Temperature



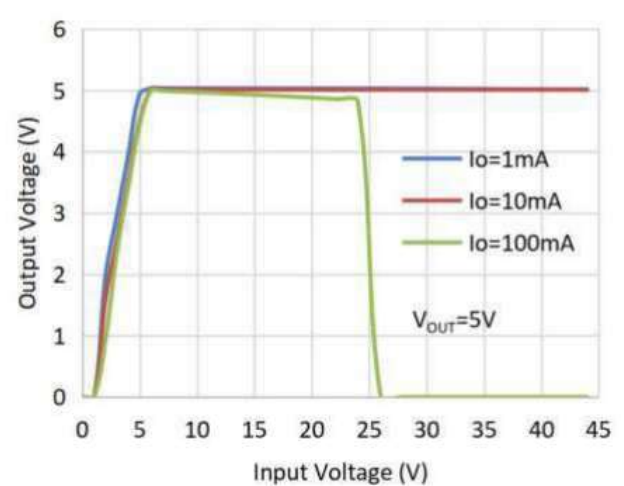
Output Voltage vs. Temperature

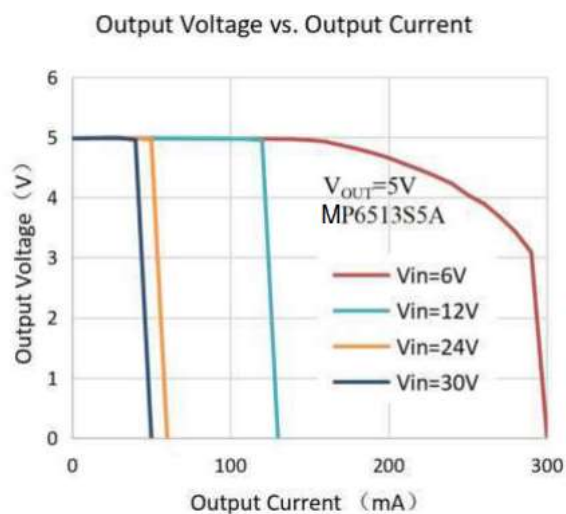
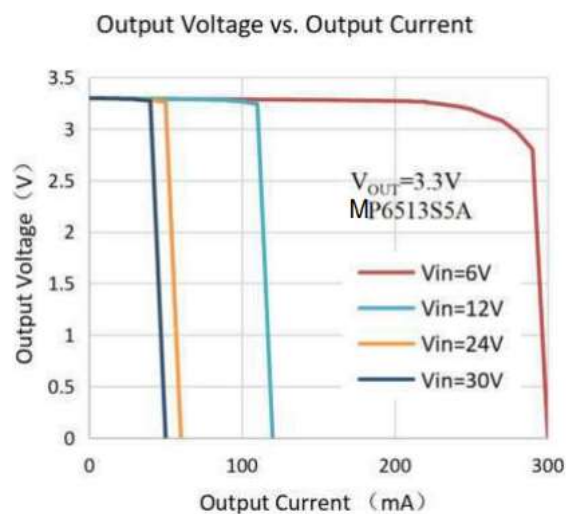
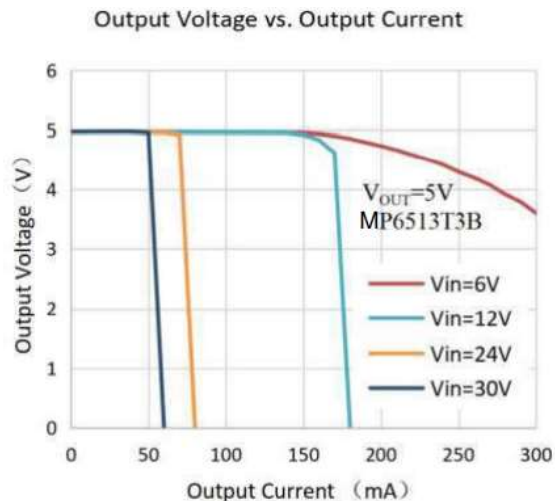
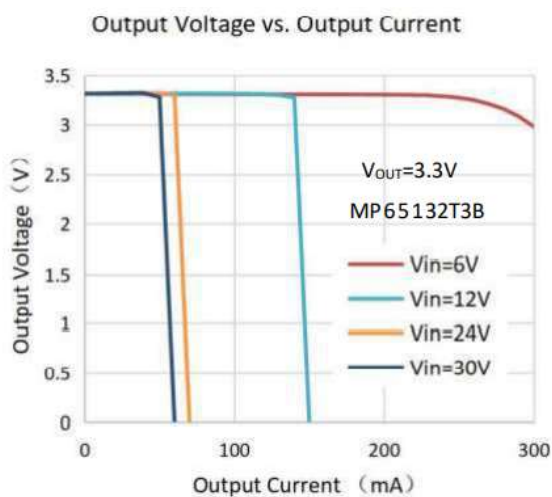
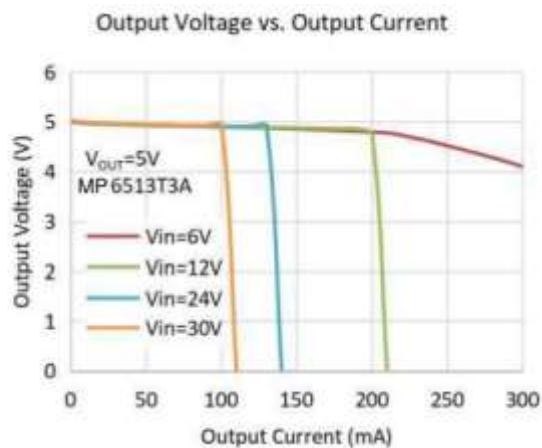
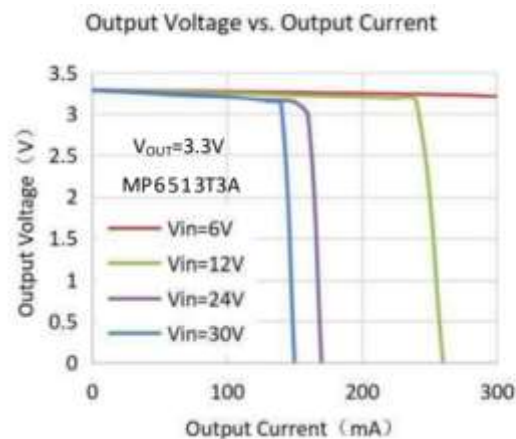


Output Voltage vs. Input Voltage

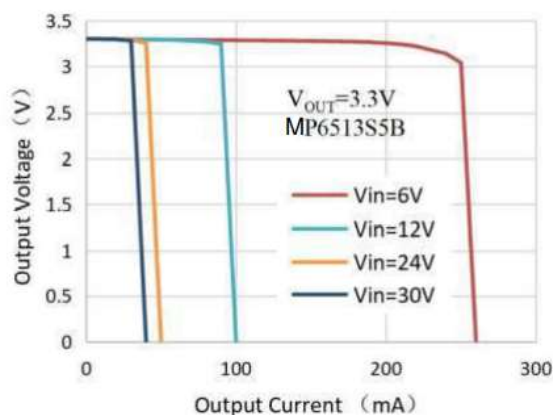


Output Voltage vs. Input Voltage

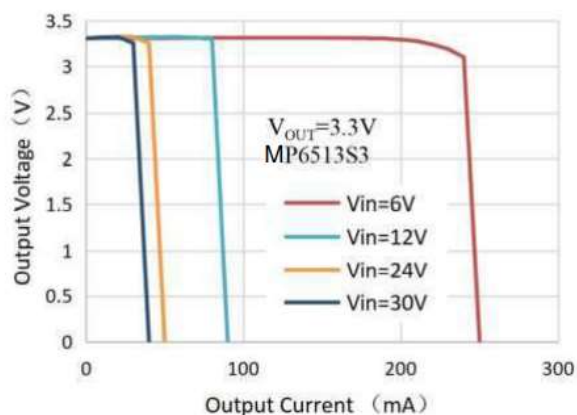




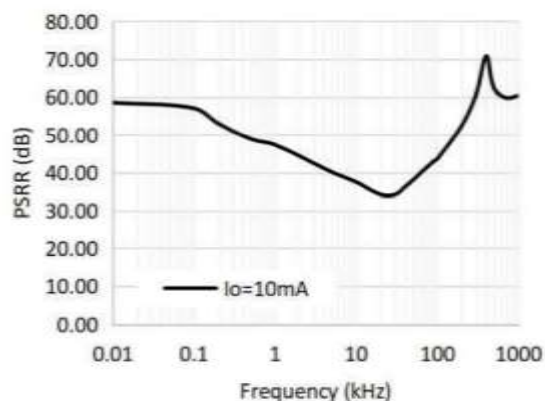
Output Voltage vs. Output Current



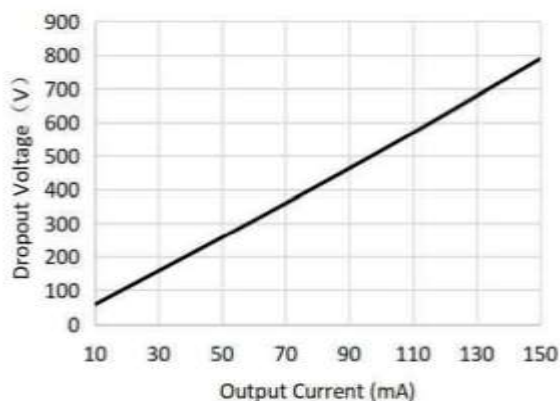
Output Voltage vs. Output Current



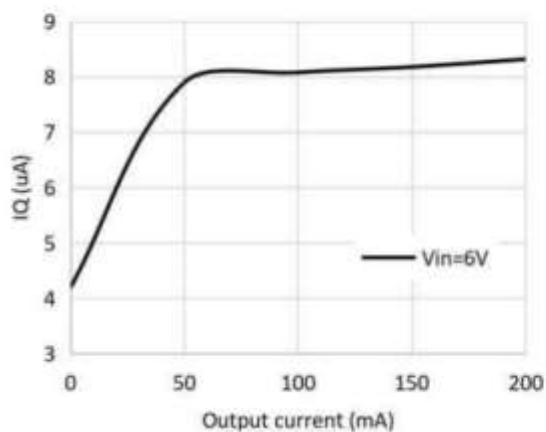
PSRR vs. Frequency



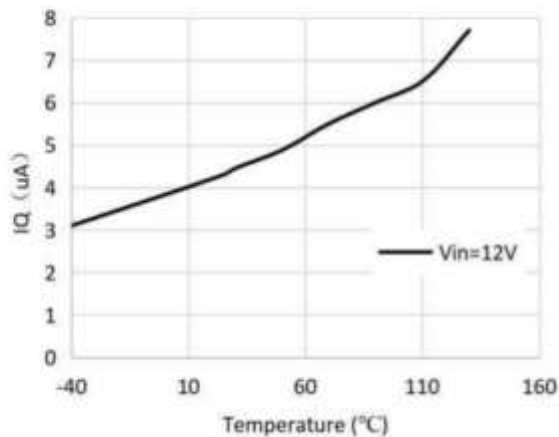
Dropout Voltage vs. Output Current

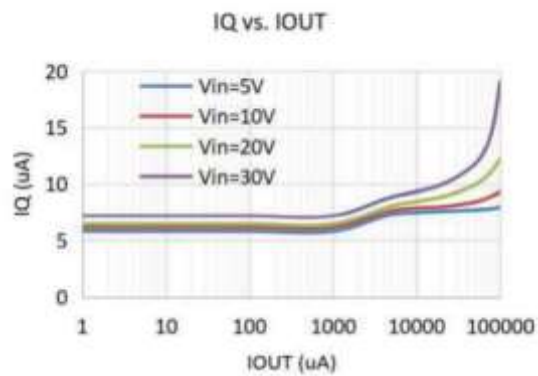


IQ vs. Output current



IQ vs. Temperature

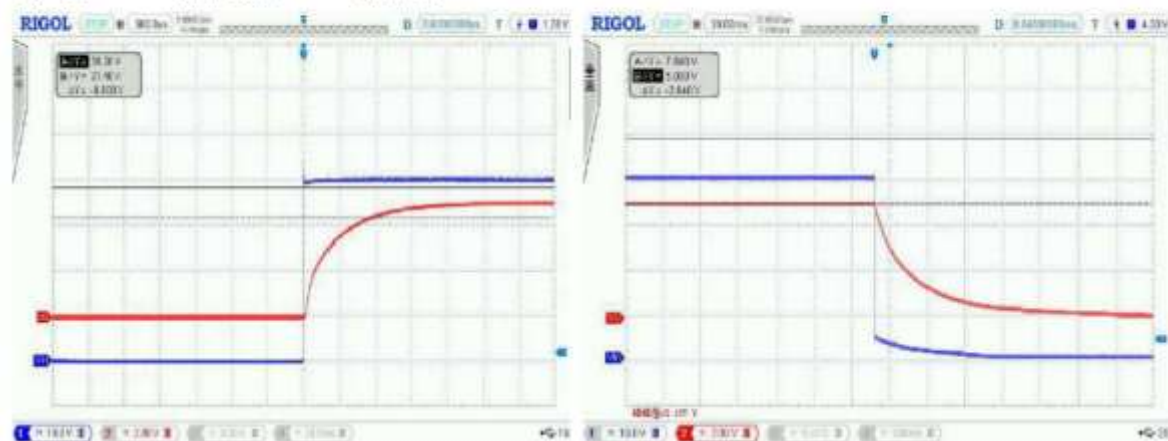




Power ON/OFF

CH1: V_{IN} CH2: V_{OUT}

$V_{IN}=40V$ $I_{OUT}=1mA$ $V_{OUT}=5V$



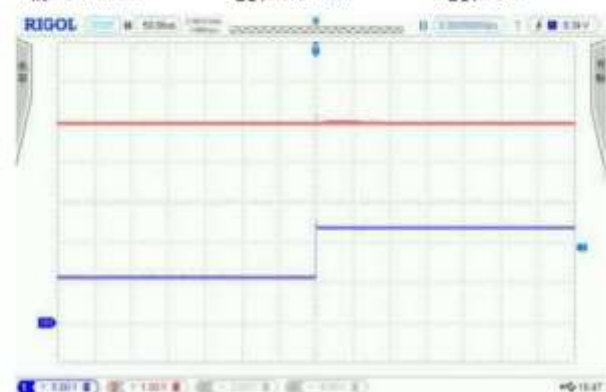
Line Transient

CH1: V_{IN} CH2: V_{OUT}

$V_{IN}=6V-12V$ $I_{OUT}=1mA$ $V_{OUT}=5V$



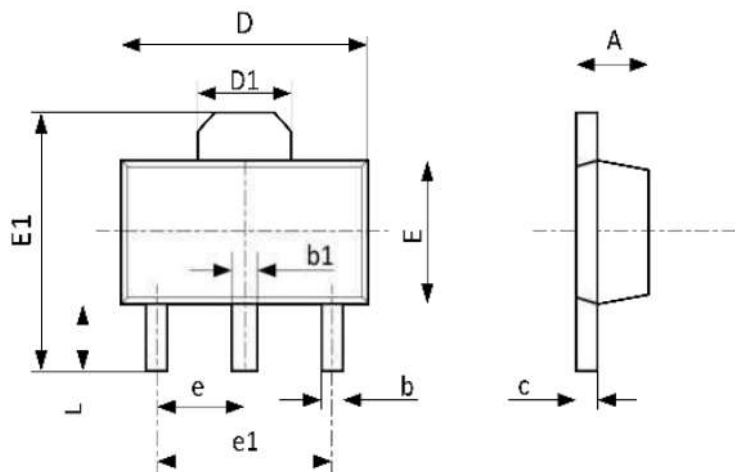
$V_{IN}=6V-12V$ $I_{OUT}=10mA$ $V_{OUT}=5V$



PACKAGE OUTLINE

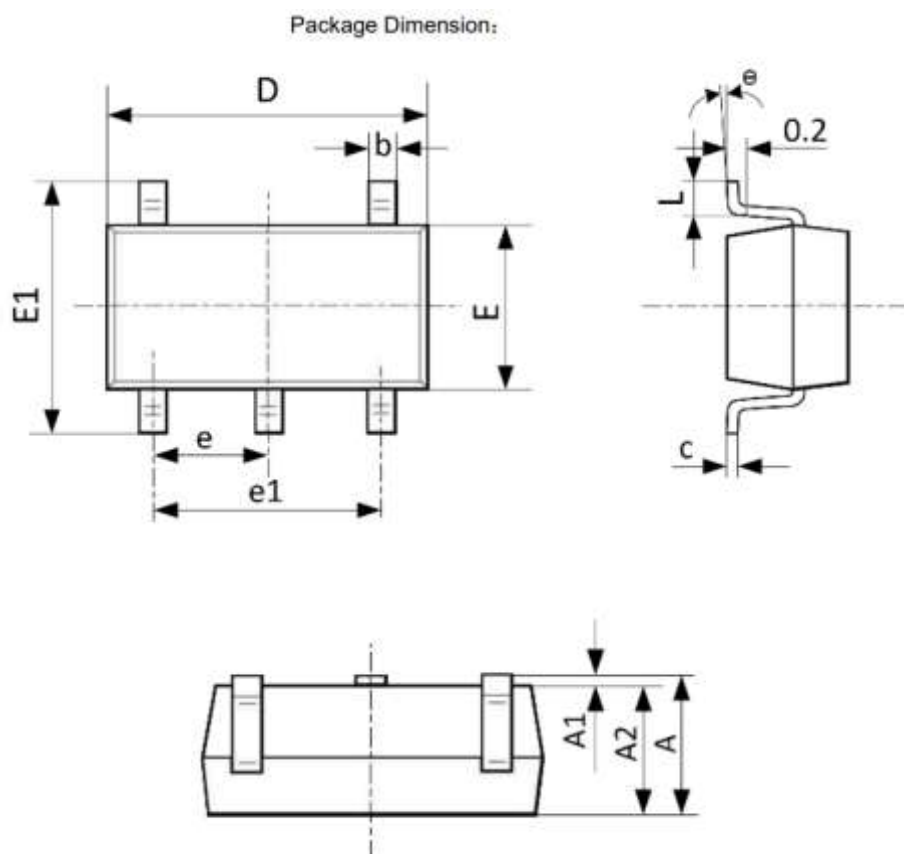
Package	SOT89-3L	Devices per reel	1000Pcs	Unit	mm
---------	----------	------------------	---------	------	----

Package Dimension:



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047

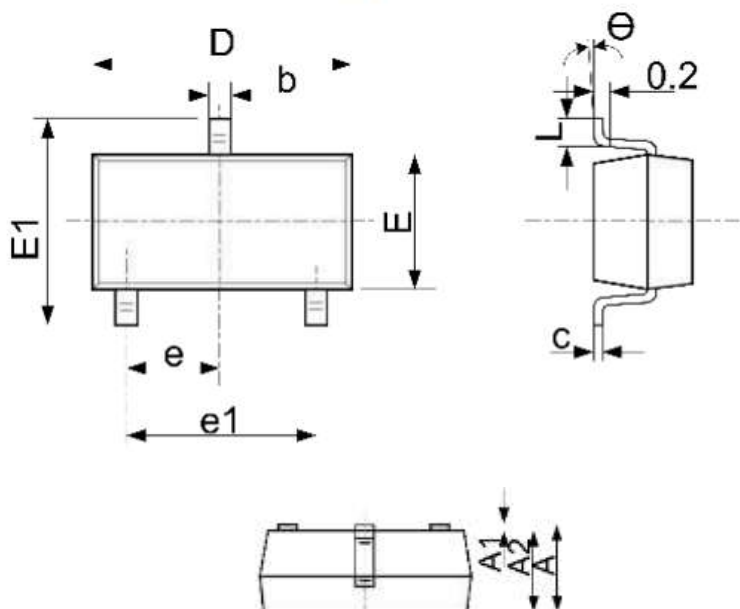
Package	SOT23-5L	Devices per reel	3000Pcs	Unit	mm
---------	----------	------------------	---------	------	----



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0℃	8℃	0℃	8℃

Package	SOT23-3L	Devices per reel	3000Pcs	Unit	mm
---------	----------	------------------	---------	------	----

Package Dimension:



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°C	8°C	0°C	8°C