



High Speed LDO Regulators, High PSRR, Low noise, ME6212 Series

General Description

The ME6212 series are highly accurate, low noise, CMOS LDO Voltage Regulators. Offering low output noise, high ripple rejection ratio, low dropout and very fast turn-on times, the ME6212 series is ideal for today's cutting edge mobile phone. Internally the ME6212 includes a reference voltage source, error amplifiers, driver transistors, current limiters and phase compensators. The ME6212's current limiters' foldback circuit also operates as a short protect for the output current limiter and the output pin. The ME6212 series is also fully compatible with low ESR ceramic capacitors, reducing cost and improving output stability. This high level of output stability is maintained even during frequent load fluctuations, due to the excellent transient response performance and high PSRR achieved across a broad range of frequencies. The CE function allows the output of regulator to be turned off, resulting in greatly reduced power consumption.

Package

- 5-pin SOT23-5

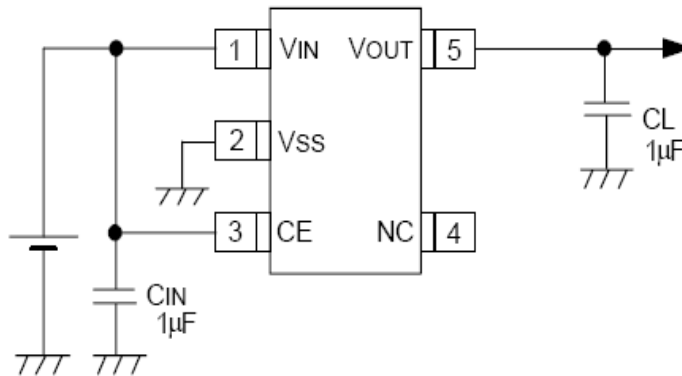
Features

- Maximum Output Current: 350mA
($V_{IN}=4.3V, V_{OUT}=3.3V$)
- Dropout Voltage: 100mV@ $I_{OUT}=100mA$
- Operating Voltage Range: 2V~6.0V
- Highly Accuracy: $\pm 2\%$
- Low Power Consumption: 50uA (TYP.)
- Standby Current: 0.1uA (TPY.)
- High Ripple Rejection: 65dB@1KHz
(ME6212C33)
- Low output noise: 50uVrms
- Line Regulation: 0.05% (TYP.)

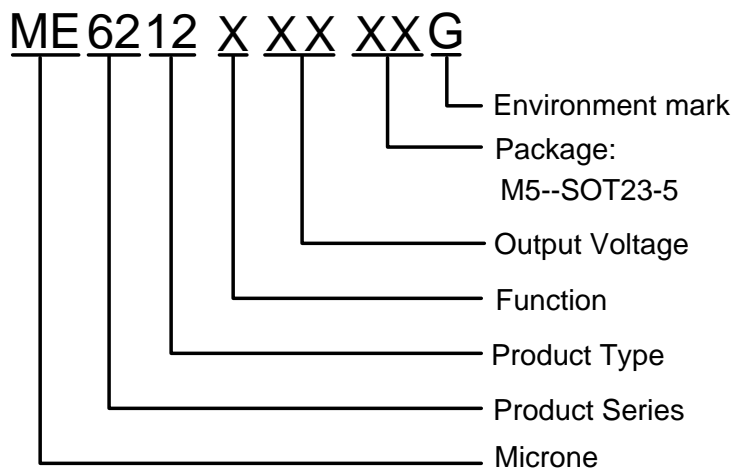
Typical Application

- Mobile phones
- Cordless phones, radio communication equipment
- Portable games
- Cameras, Video cameras
- Reference voltage sources
- Battery powered equipment

Typical Application Circuit

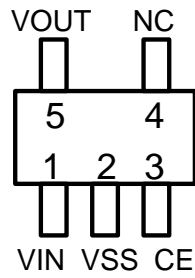


Selection Guide



product series	Output voltage	Package
ME6212C12M5G	1.2V	SOT23-5
ME6212C15M5G	1.5V	SOT23-5
ME6212C18M5G	1.8V	SOT23-5
ME6212C21M5G	2.1V	SOT23-5
ME6212C25M5G	2.5V	SOT23-5
ME6212C28M5G	2.8V	SOT23-5
ME6212C30M5G	3.0V	SOT23-5
ME6212C33M5G	3.3V	SOT23-5
ME6212C50M5G	5.0V	SOT23-5

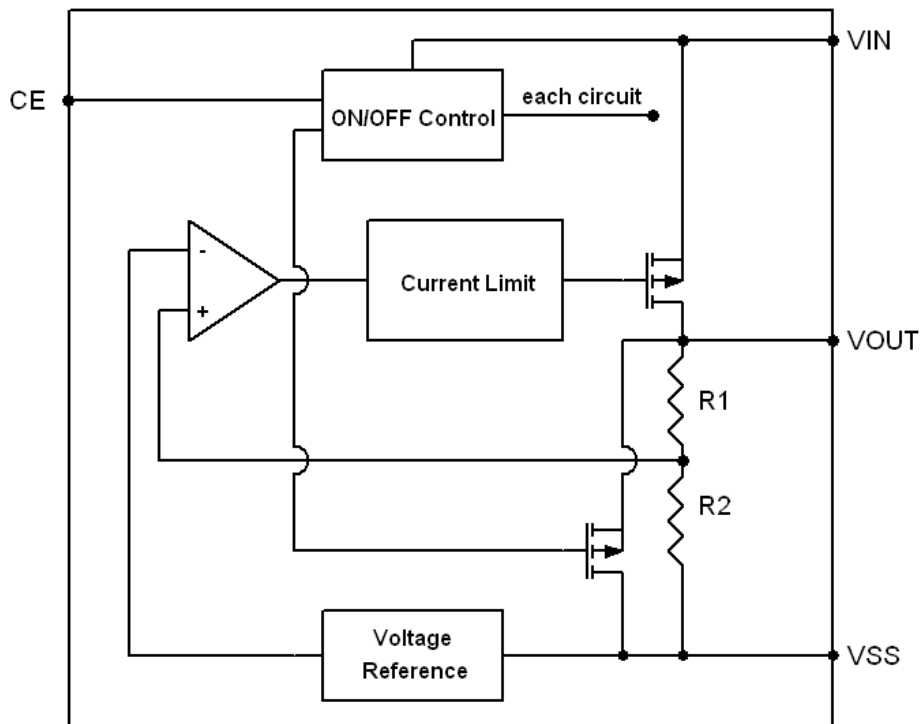
Pin Configuration (SOT23-5)



Pin Assignment

Pin Number	Pin Name	Functions
SOT23-5		
1	V_{IN}	Power Input
2	V_{SS}	Ground
3	CE	ON / OFF Control
4	NC	No Connect
5	V_{OUT}	Output

Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Units
Input Voltage	V_{IN}	6.5	V
Output Current	I_{OUT}	500	mA
Output Voltage	V_{OUT}	$V_{SS}-0.3 \sim V_{IN} + 0.3$	V
CE Pin Voltage	V_{CE}	$V_{SS}-0.3 \sim V_{IN} + 0.3$	V
Power Dissipation	P_D	300	mW
SOT23-5			
Operating Temperature Range	T_{OPR}	$-40 \sim +150$	$^{\circ}C$
Storage Temperature Range	T_{STG}	$-40 \sim +150$	$^{\circ}C$

Electrical Characteristics

ME6212C12 ($V_{IN} = V_{OUT} + 1V$, $V_{CE} = V_{IN}$, $C_{IN} = C_L = 1\mu F$, $T_a = 25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT} = 30mA$, $V_{IN} = V_{OUT} + 1V$	X 0.98	$V_{OUT(T)}$ (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	$V_{IN} = V_{OUT} + 1V$		250		mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$, $1mA \leq I_{OUT} \leq 100mA$		8		mV
Dropout Voltage (Note 1)	V_{DIF1}	$I_{OUT} = 100mA$		280		mV
	V_{DIF2}	$I_{OUT} = 200mA$		500		mV
Supply Current	I_{SS}	$V_{IN} = V_{OUT} + 1V$		50		μA
Stand-by Current	I_{CEL}	$V_{CE} = 0V$		0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 40mA$ $V_{OUT} + 1V \leq V_{IN} \leq 6.5V$		0.03		%/V
CE "High" Voltage	V_{CEH}	Start up	1.0			V
CE "Low" Voltage	V_{CEL}	Shut down			0.5	V
Output noise	EN	$I_{OUT} = 40mA$, 300Hz~50kHz		50		μV_{rms}
Ripple Rejection Rate	PSRR	$V_{IN} = [V_{OUT} + 1]V + 1Vp-pAC$	$I_{OUT} = 10mA$, 1kHz		65	dB
			$I_{OUT} = 100mA$, 10kHz		57	

ME6212C18 ($V_{IN} = V_{OUT} + 1V$, $V_{CE} = V_{IN}$, $C_{IN} = C_L = 1\mu F$, $T_a = 25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT} = 30mA$, $V_{IN} = V_{OUT} + 1V$	X 0.98	$V_{OUT(T)}$ (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	$V_{IN} = V_{OUT} + 1V$		250		mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$, $1mA \leq I_{OUT} \leq 100mA$		9		mV
Dropout Voltage (Note 1)	V_{DIF1}	$I_{OUT} = 100mA$		200		mV
	V_{DIF2}	$I_{OUT} = 200mA$		400		mV
Supply Current	I_{SS}	$V_{IN} = V_{OUT} + 1V$		40		μA

Stand-by Current	I_{CEL}	$V_{CE}=0V$		0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $V_{OUT}+1V \leq V_{IN} \leq 6.5V$		0.05		%/V
CE “High” Voltage	V_{CEH}	Start up	1.0			V
CE “Low” Voltage	V_{CEL}	Shut down			0.5	V
Output noise	EN	$I_{OUT}=40mA$, 300Hz~50kHz		50		μV_{rms}
Ripple Rejection Rate	PSRR	$V_{IN} = [V_{OUT} + 1]V + 1V_{p-pAC}$	$I_{OUT}=10mA$, 1kHz	65		dB
			$I_{OUT}=100mA$, 10kHz	57		

ME6212C25 ($V_{IN}=V_{OUT}+1V$, $V_{CE}=V_{IN}$, $C_{IN}=C_L=1\mu F$, $T_a=25^\circ C$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT}=30mA$, $V_{IN}=V_{OUT}+1V$	X 0.98	$V_{OUT(T)}$ (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	$V_{IN}=V_{OUT}+1V$		300		mA
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1V$, $1mA \leq I_{OUT} \leq 100mA$		9		mV
Dropout Voltage (Note 1)	V_{DIF1}	$I_{OUT}=100mA$		110		mV
	V_{DIF2}	$I_{OUT}=200mA$		220		mV
Supply Current	I_{SS}	$V_{IN}=V_{OUT}+1V$		50		μA
Stand-by Current	I_{CEL}	$V_{CE}=0V$		0		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $V_{OUT}+1V \leq V_{IN} \leq 6.5V$		0.04		%/V
CE“High”Voltage	V_{CEH}	Start up	1.0			V
CE “Low” Voltage	V_{CEL}	Shut down			0.5	V
Output noise	EN	$I_{OUT}=40mA$, 300Hz~50kHz		50		μV_{rms}
Ripple Rejection Rate	PSRR	$V_{IN}=[V_{OUT}+1]V + 1V_{p-pAC}$	$I_{OUT}=10mA$, 1kHz	65		dB
			$I_{OUT}=100mA$, 10kHz	57		
			$I_{OUT}=200mA$, 10kHz	57		
Short-circuit Current	I_{SHORT}	$V_{IN}=V_{OUT}+1V$, $V_{CE}=V_{IN}$, $V_{OUT}=0V$		150		mA

ME6212C28 ($V_{IN}=V_{OUT}+1V$, $V_{CE}=V_{IN}$, $C_{IN}=C_L=1\mu F$, $T_a=25^\circ C$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT}=30mA$, $V_{IN}=V_{OUT}+1V$	X 0.98	$V_{OUT(T)}$ (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	$V_{IN}=V_{OUT}+1V$		350		mA
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1V$, $1mA \leq I_{OUT} \leq 100mA$		7		mV
Dropout Voltage	V_{DIF1}	$I_{OUT}=100mA$		110		mV

(Note 1)	V_{DIF2}	$I_{OUT} = 200mA$		220		mV
Supply Current	I_{SS}	$V_{IN} = V_{OUT} + 1V$		60		μA
Stand-by Current	I_{CEL}	$V_{CE} = 0V$		0		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 40mA$ $V_{OUT} + 1V \leq V_{IN} \leq 6.5V$		0.04		%/V
CE "High" Voltage	V_{CEH}	Start up	1.0			V
CE "Low" Voltage	V_{CEL}	Shut down			0.5	V
Output noise	EN	$I_{OUT} = 40mA$, 300Hz~50kHz		50		μV_{rms}
Ripple Rejection Rate	PSRR	$V_{IN} = [V_{OUT} + 1]V$ $+1V_{p-pAC}$	$I_{OUT} = 10mA$, 1kHz		65	dB
			$I_{OUT} = 100mA$, 10kHz		57	
			$I_{OUT} = 200mA$, 10kHz		57	
Short-circuit Current	I_{SHORT}	$V_{IN} = V_{OUT} + 1V$, $V_{CE} = V_{IN}$, $V_{OUT} = 0V$		120		mA

ME6212C30 ($V_{IN} = V_{OUT} + 1V$, $V_{CE} = V_{IN}$, $C_{IN} = C_L = 1\mu F$, $T_a = 25^\circ C$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT} = 30mA$, $V_{IN} = V_{OUT} + 1V$	X 0.98	$V_{OUT(T)}$ (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	$V_{IN} = V_{OUT} + 1V$		350		mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$, $1mA \leq I_{OUT} \leq 100mA$		8		mV
Dropout Voltage (Note 1)	V_{DIF1}	$I_{OUT} = 100mA$		100		mV
	V_{DIF2}	$I_{OUT} = 200mA$		210		mV
Supply Current	I_{SS}	$V_{IN} = V_{OUT} + 1V$		60		μA
Stand-by Current	I_{CEL}	$V_{CE} = 0V$		0		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 40mA$ $V_{OUT} + 1V \leq V_{IN} \leq 6.5V$		0.05		%/V
CE "High" Voltage	V_{CEH}	Start up	1.0			V
CE "Low" Voltage	V_{CEL}	Shut down			0.5	V
Output noise	EN	$I_{OUT} = 40mA$, 300Hz~50kHz		50		μV_{rms}
Ripple Rejection Rate	PSRR	$V_{IN} = [V_{OUT} + 1]V$ $+1V_{p-pAC}$	$I_{OUT} = 10mA$, 1kHz		65	dB
			$I_{OUT} = 100mA$, 10kHz		57	
			$I_{OUT} = 200mA$, 10kHz		57	
Short-circuit Current	I_{SHORT}	$V_{IN} = V_{OUT} + 1V$, $V_{CE} = V_{IN}$, $V_{OUT} = 0V$		150		mA

ME6212C33 ($V_{IN}=V_{OUT}+1V$, $V_{CE}=V_{IN}$, $C_{IN}=C_L=1\mu F$, $T_a=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT}=30mA$, $V_{IN}=V_{OUT}+1V$	X 0.98	$V_{OUT(T)}$ (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	$V_{IN}=V_{OUT}+1V$		350		mA
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1V$, $1mA \leq I_{OUT} \leq 100mA$		9		mV
Dropout Voltage (Note 1)	V_{DIF1}	$I_{OUT}=100mA$		120		mV
	V_{DIF2}	$I_{OUT}=200mA$		260		mV
Supply Current	I_{SS}	$V_{IN}=V_{OUT}+1V$		60		μA
Stand-by Current	I_{CEL}	$V_{CE}=0V$		0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $V_{OUT}+1V \leq V_{IN} \leq 6.5V$		0.05		%/V
CE "High" Voltage	VCEH	Start up	1.0			V
CE "Low" Voltage	VCEL	Shut down			0.5	V
Output noise	EN	$I_{OUT}=40mA$, 300Hz~50kHz		50		μV_{rms}
Ripple Rejection Rate	PSRR	$V_{IN}=[V_{OUT}+1]V$ $+1V_{p-pAC}$	$I_{OUT}=10mA$, 1kHz	65		dB
			$I_{OUT}=100mA$, 10kHz	57		
			$I_{OUT}=200mA$, 10kHz	57		
Short-circuit Current	I_{SHORT}	$V_{IN}=V_{OUT}+1V$, $V_{CE}=V_{IN}$, $V_{OUT}=0V$		180		mA

ME6212C50 ($V_{IN}=V_{OUT}+1V$, $V_{CE}=V_{IN}$, $C_{IN}=C_L=1\mu F$, $T_a=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT}=30mA$, $V_{IN}=V_{OUT}+1V$	X 0.98	$V_{OUT(T)}$ (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	$V_{IN}=V_{OUT}+1V$		350		mA
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1V$, $1mA \leq I_{OUT} \leq 100mA$		8		mV
Dropout Voltage (Note 1)	V_{DIF1}	$I_{OUT}=100mA$		100		mV
	V_{DIF2}	$I_{OUT}=200mA$		200		mV
Supply Current	I_{SS}	$V_{IN}=V_{OUT}+1V$		50		μA
Stand-by Current	I_{CEL}	$V_{CE}=0V$		0		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $V_{OUT}+1V \leq V_{IN} \leq 6.5V$		0.05		%/V
CE "High" Voltage	VCEH	Start up	1.0			V
CE "Low" Voltage	VCEL	Shut down			0.7	V
Output noise	EN	$I_{OUT}=40mA$, 300Hz~50kHz		50		μV_{rms}
Ripple Rejection Rate	PSRR	$V_{IN}=[V_{OUT}+1]V$ $+1V_{p-pAC}$	$I_{OUT}=10mA$, 1kHz	65		dB
			$I_{OUT}=100mA$, 10kHz	57		

			$I_{OUT}=200mA,$ $10kHz$		57	
Short-circuit Current	I_{SHORT}	$V_{IN}=V_{OUT}+1V, V_{CE}=V_{IN}, V_{OUT}$ $=0V$			130	mA

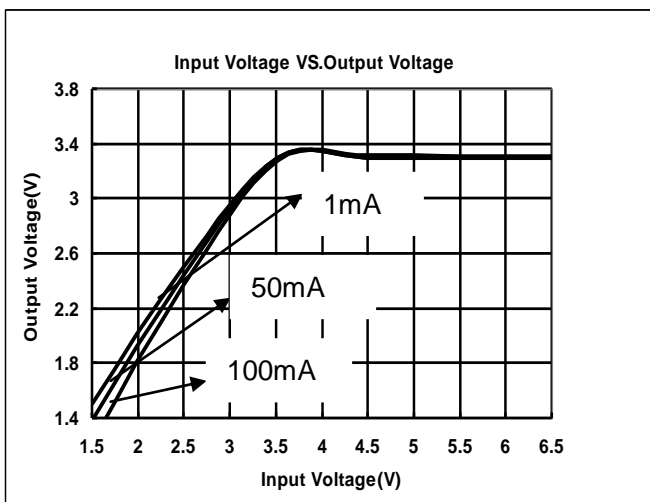
Note :

1. $V_{OUT}(T)$: Specified Output Voltage
2. $V_{OUT}(E)$: Effective Output Voltage (i.e. The output voltage when " $V_{OUT}(T)+1.0V$ " is provided at the Vin pin while maintaining a certain Iout value.)
3. $V_{DIF}: V_{IN1} - V_{OUT}(E)'$
 V_{IN1} : The input voltage when $V_{OUT}(E)'$ appears as input voltage is gradually decreased.
 $V_{OUT}(E)'$ = A voltage equal to 98% of the output voltage whenever an amply stabilized Iout { $V_{OUT}(T)+1.0V$ } is input.

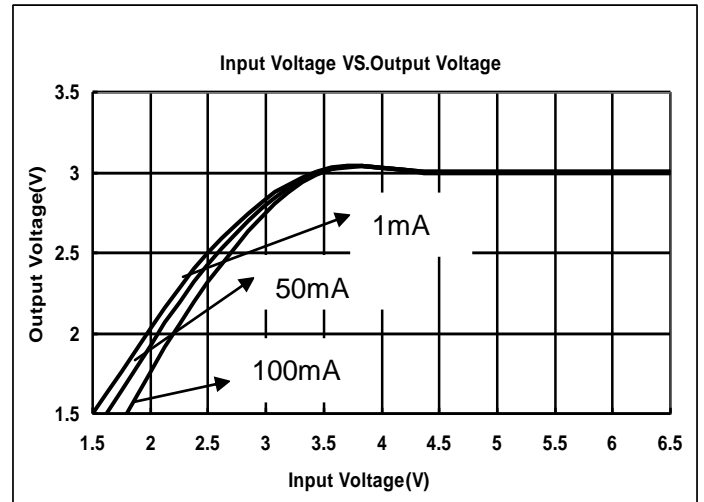
Type Characteristics

(1)) Input Voltage VS. Output Voltage ($T_a = 25^\circ C$)

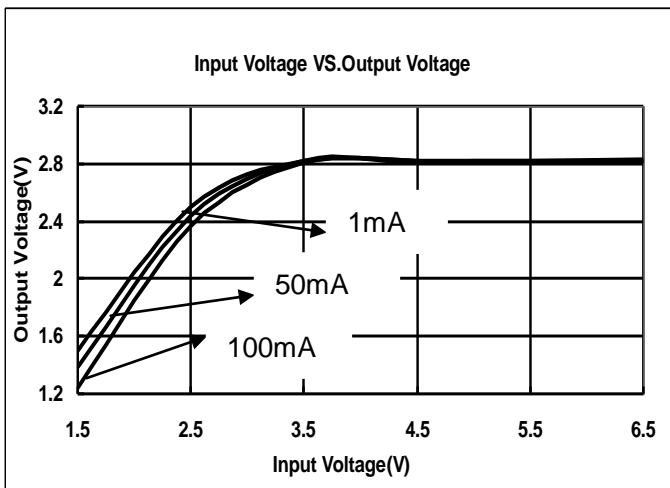
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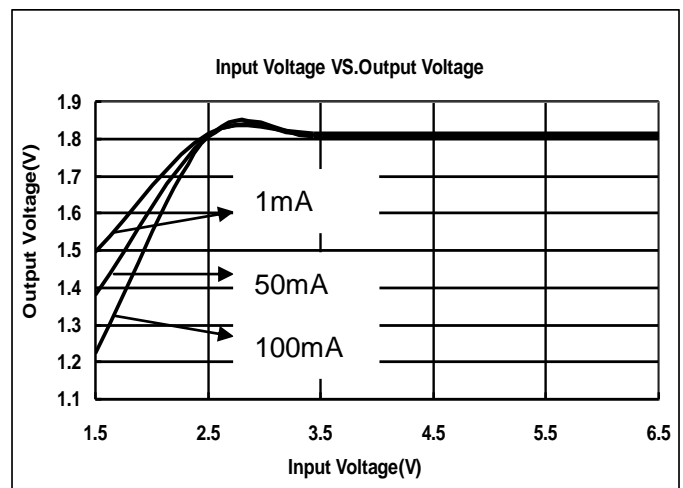
ME6212C30M5G



ME6212C28M5G

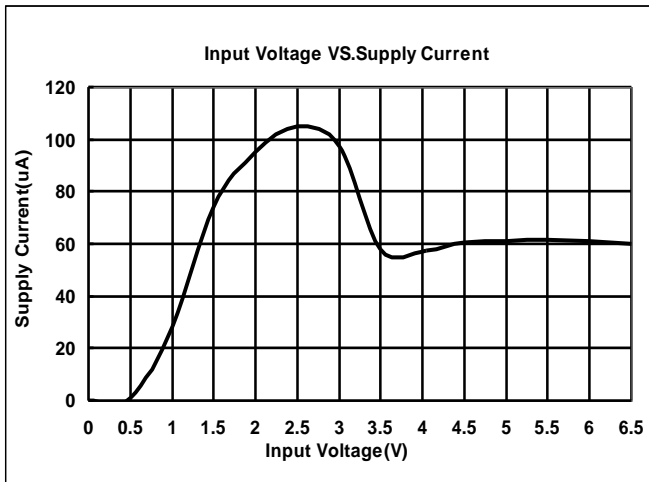


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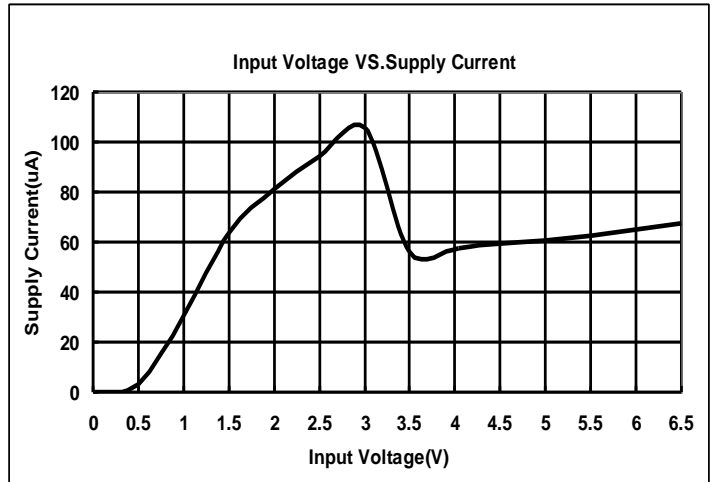


(2) Input Voltage VS. Supply Current (Ta = 25 °C)

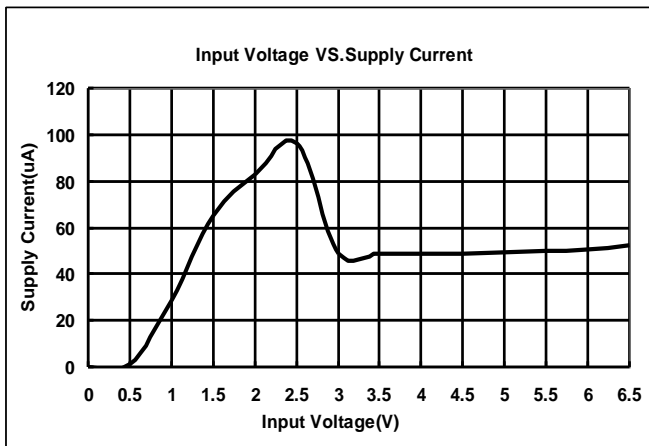
ME6212C33M5G



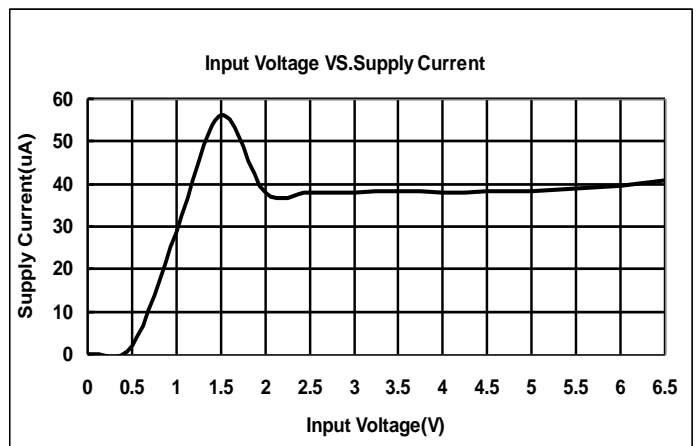
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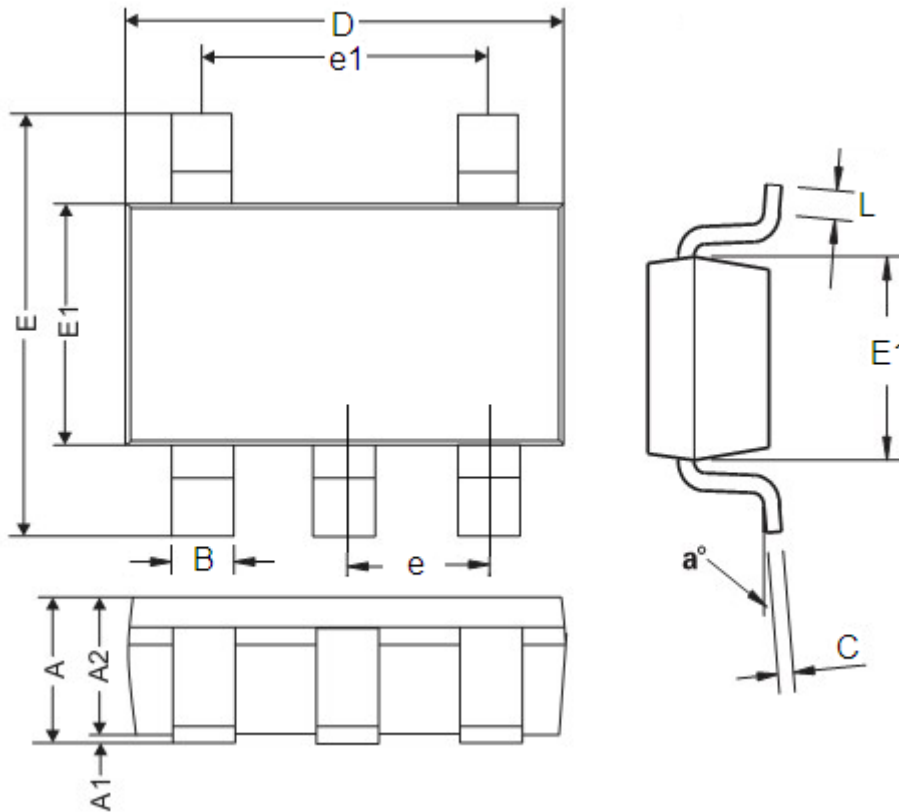


ME6212C18M5G



Packaging Information

● SOT23-5



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.9	1.45	0.0354	0.0570
A1	0	0.15	0	0.0059
A2	0.9	1.3	0.0354	0.0511
B	0.2	0.5	0.0078	0.0196
C	0.09	0.26	0.0035	0.0102
D	2.7	3.10	0.1062	0.1220
E	2.2	3.2	0.0866	0.1181
E1	1.30	1.80	0.0511	0.0708
e	0.95REF		0.0374REF	
e1	1.90REF		0.0748REF	
L	0.10	0.60	0.0039	0.0236
a°	0°	30°	0°	30°

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