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.

Features

- Maximum Output Current: 350mA
  （V_{IN}＝4.3V,V_{OUT}＝3.3V）
- Dropout Voltage: 120mV@ I_{OUT} =100mA
- Operating Voltage Range: 2V～6.0V
- Highly Accuracy: ±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.）

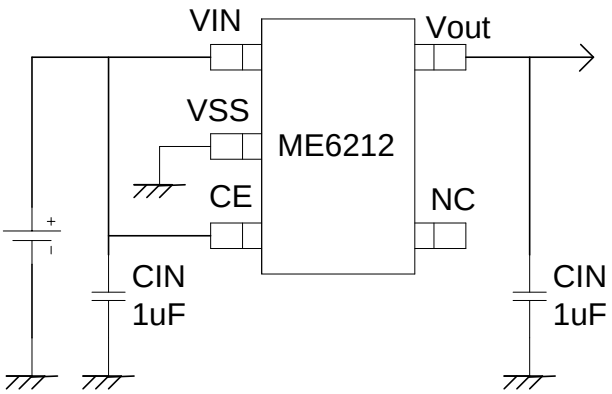
Typical Application

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

Package

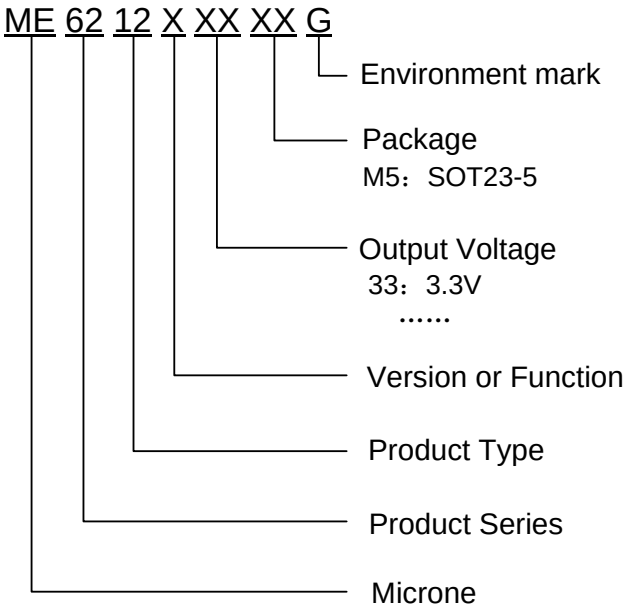
- 5-pin SOT23-5

Typical Application Circuit



Selection Guide

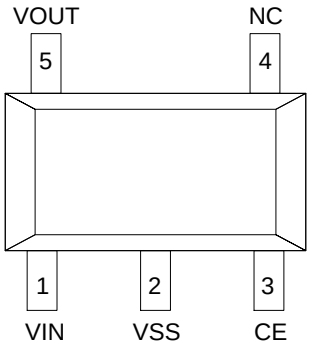
ME6212C30M5G表面丝印内容：CGXX
说明：CG是料号固定代码，XX是年月不固定



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
ME6212C29M5G	2.9V	SOT23-5
ME6212C30M5G	3.0V	SOT23-5
ME6212C33M5G	3.3V	SOT23-5
ME6212C50M5G	5.0V	SOT23-5

NOTE: If you need other voltage and package, please contact our sales staff。

Pin Configuration

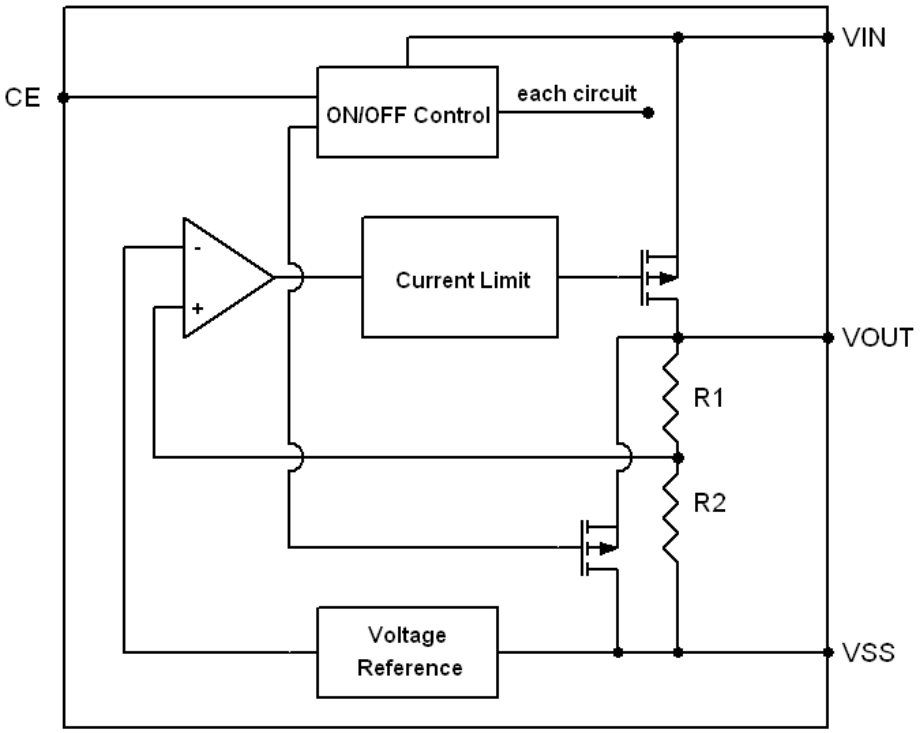


SOT23-5

Pin Assignment

Pin Number	Pin Name	Functions
SOT23-5		
1	VIN	Power Input
2	VSS	Ground
3	CE	ON / OFF Control
4	NC	No Connect
5	VOUT	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}	Vss-0.3～V_{IN} +0.3	V
CE Pin Voltage		V_{CE}	Vss-0.3～V_{IN} +0.3	V
Power Dissipation	SOT23-5	P_D	0.6	W
Thermal resistance (Junction to air)	SOT23-5	θ_{JA}	210	℃/W
Operating Ambient Temperature Range		T_{OPR}	-40 ~ +85	℃
Junction Temperature		T_J	-40 ~ +150	℃
Storage Temperature Range		T_{STG}	-55 ~ +150	℃

Electrical Characteristics

ME6212C12 (V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，$C_{IN=}C_L$=1uF，Ta=25^{O}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≤I_{OUT}≤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	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤6.5V			0.03		%/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		uVrms
Ripple Rejection Rate	PSRR	V_{IN} = [V_{OUT} +1]V +1Vp-pAC	I_{OUT}=10mA, 1kHZ		65		dB
			I_{OUT}=100mA, 10kHZ		57		

ME6212C15 (V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，$C_{IN=}C_L$=1uF，Ta=25^{O}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≤I_{OUT}≤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		50		μA
Stand-by Current	I_{CEL}	V_{CE}＝0V		0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤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		uVrms
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=1uF，Ta=25^{O}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≤I_{OUT}≤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			50		μA
Stand-by Current	I_{CEL}	V_{CE}＝0V			0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤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		uVrms
Ripple Rejection Rate	PSRR	V_{IN} = [V_{OUT} +1]V+1Vp-pAC	I_{OUT}=10mA,1kHZ		65		dB
			I_{OUT}=100mA,10kHZ		57		

ME6212C21 (V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，C_{IN}=C_L=1uF，Ta=25^{O}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≤I_{OUT}≤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		50		μA
Stand-by Current	I_{CEL}	V_{CE}＝0V		0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤6.5V		0.04		%/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		uVrms
Ripple Rejection Rate	PSRR	V_{IN}=[V_{OUT}+1] V+1Vp-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

ME6212C25 (V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，C_{IN}=C_L=1uF，Ta=25^{O}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≤I_{OUT}≤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			0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤6.5V			0.04		%/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		uVrms
Ripple Rejection Rate	PSRR	V_{IN}=[V_{OUT}+1] V+1Vp-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=1uF，Ta=25°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) (Note1)	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≤I_{OUT}≤100mA			7		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			0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤6.5V			0.04		%/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		uVrms
Ripple Rejection Rate	PSRR	V_{IN}=[V_{OUT}+1]V +1Vp-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

ME6212C29 (V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，C_{IN}=C_L=1uF，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≤I_{OUT}≤100mA		7		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		0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤6.5V		0.04		%/V
CE“High”Voltage	VCEH	Start up	1.0			V
CE “Low” Voltage	VCEL	Shut down			0.5	V

Output noise	Noise	I_{OUT} =40mA，300Hz~50kHz			50		uVrms
Ripple Rejection Rate	PSRR	V_{IN} =[V_{OUT}+1]V +1Vp-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=1uF，Ta=25°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≤I_{OUT}≤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			50		μA
Stand-by Current	I_{CEL}	V_{CE}=0V			0		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤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		uVrms
Ripple Rejection Rate	PSRR	V_{IN}=[V_{OUT} +1]V+1Vp-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=1uF，Ta=25°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	X0.98	V_{OUT} (T) (Note 1)	X1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1V		350		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1V , 1mA≤I_{OUT}≤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		50		μA
Stand-byCurrent	I_{CEL}	V_{CE}=0V		0.1		μA

Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤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		uVrms
Ripple Rejection Rate	PSRR	V_{IN}=[V_{OUT}+1]V +1Vp-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	14	28	50	mA

ME6212C50 (V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，C_{IN}=C_L=1uF，Ta=25^{O}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≤I_{OUT}≤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	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤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		uVrms
Ripple Rejection Rate	PSRR	V_{IN}= [V_{OUT}+1]V +1Vp-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 (Ie. 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)’

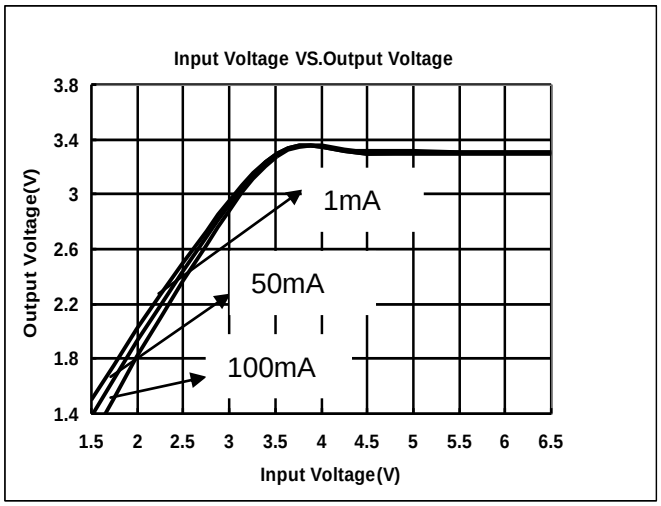
V_{IN1} ： The input voltage when V_{OUT}(E)’ appears as input voltage is gradually decreased.

V_{OUT} (E)’=A voltage equal to 98% of the output voltage whenever an amply stabilized Iout {V_{OUT} (T)+1.0V} is input.

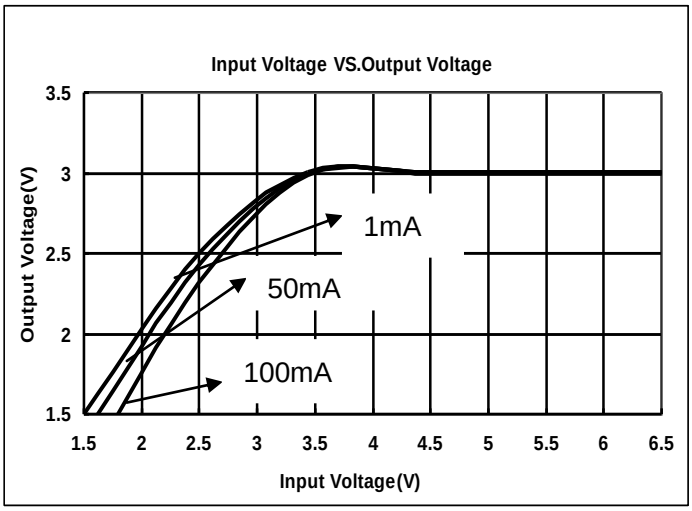
Type Characteristics

（1））Input VoltageVS.Output Voltage（**Ta = 25 °C**）

ME6212C33M5G



ME6212C30M5G



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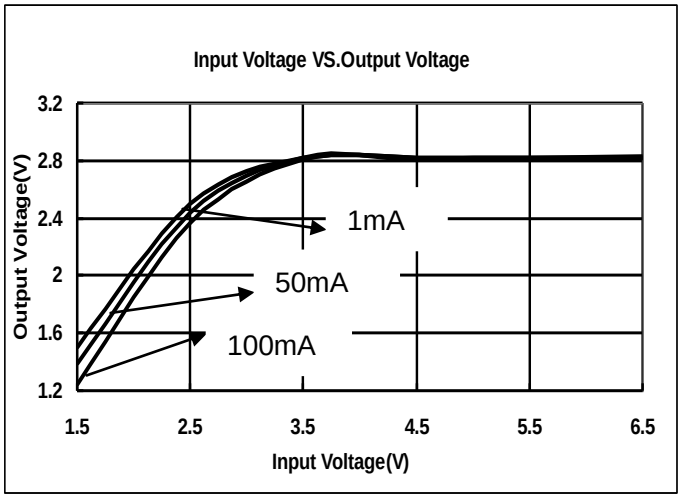
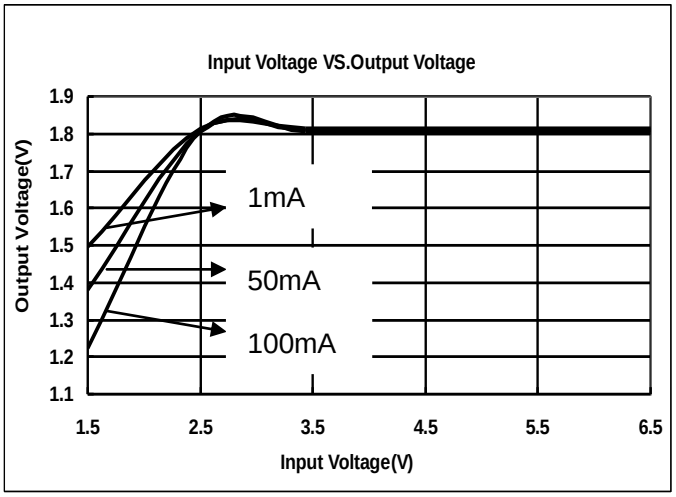
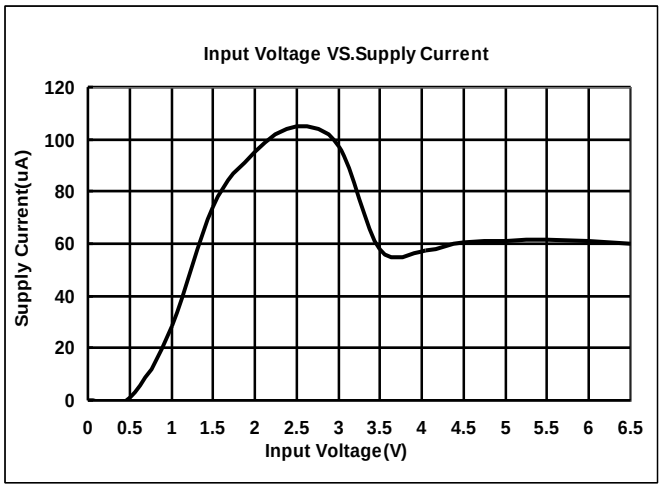


ME6212C18M5G



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

ME6212C33M5G



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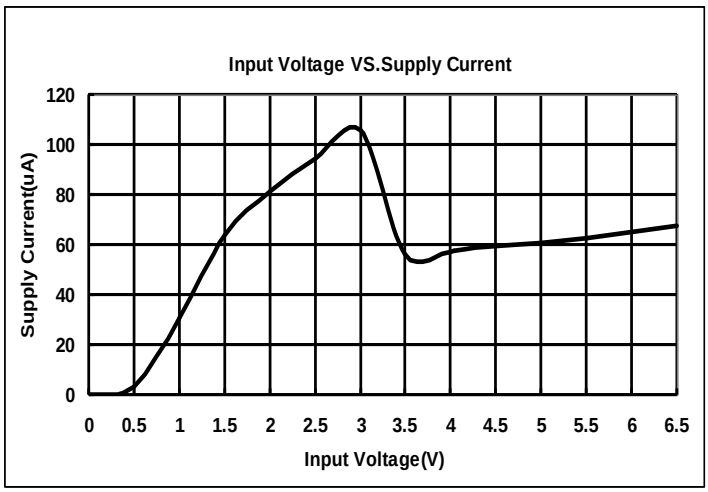

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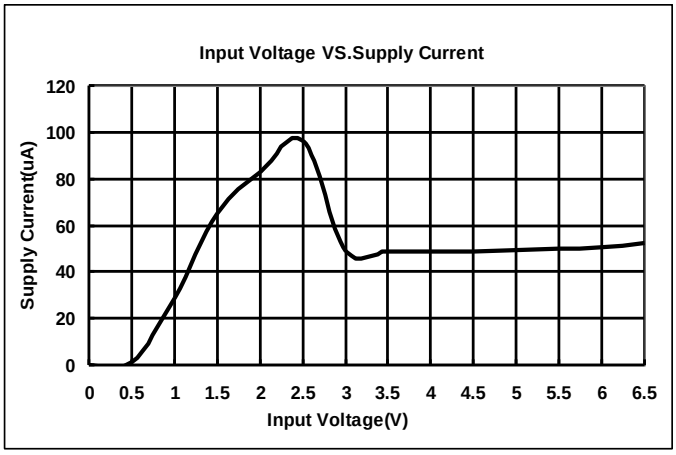

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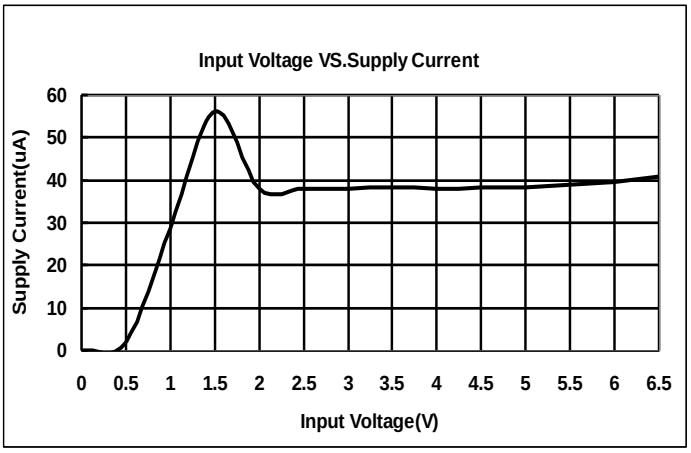
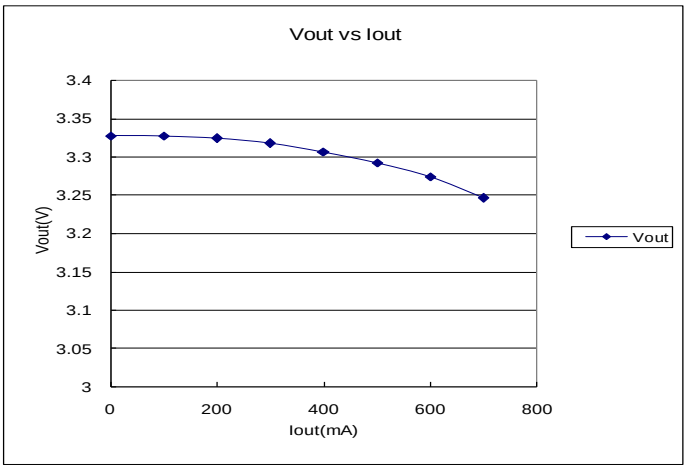
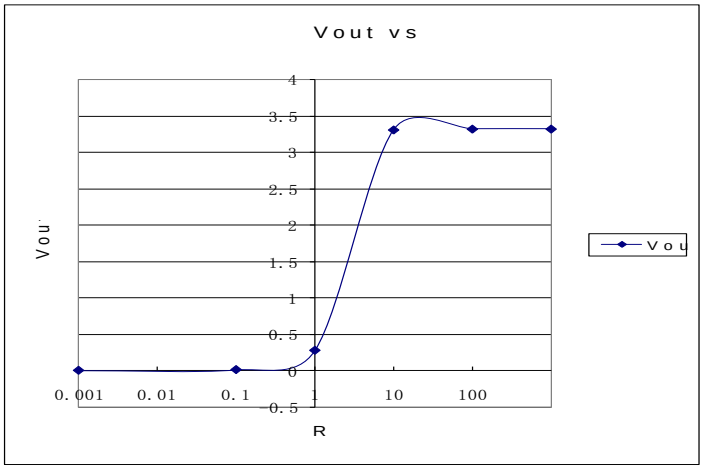


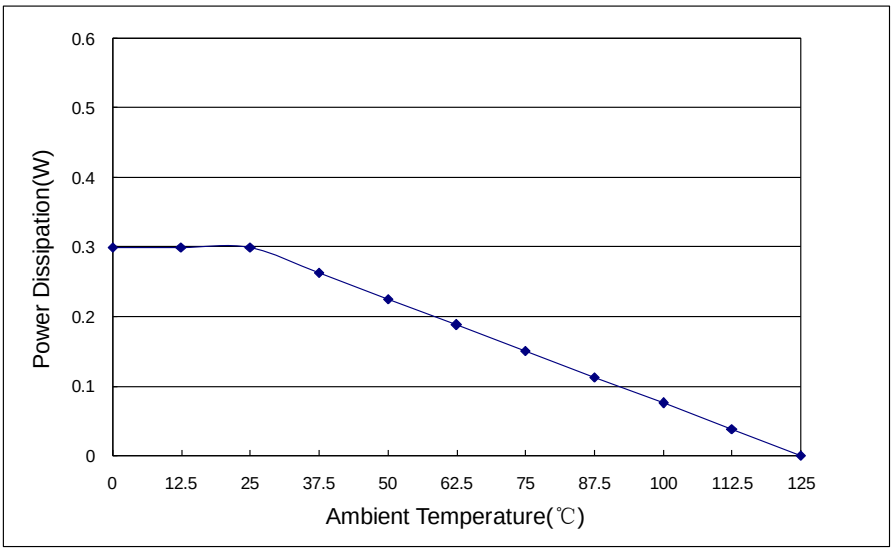
（3）Output Voltage VS. Output Current



（4）Output Voltage VS. Output Load R

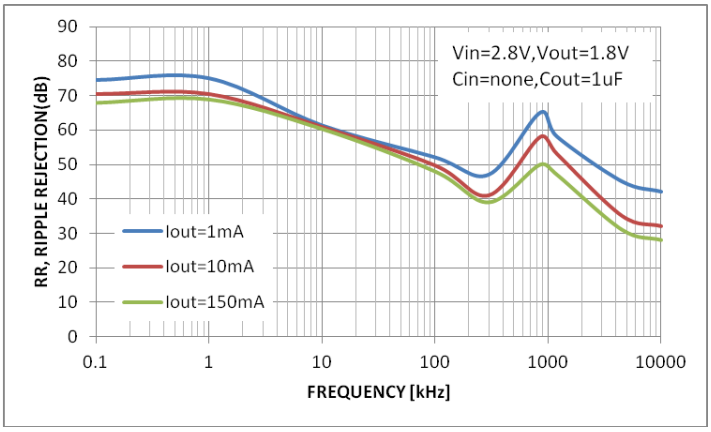


（5）Power Dissipation(W) VS Ambient Temperature



（6）PSRR

ME6212C18M5G



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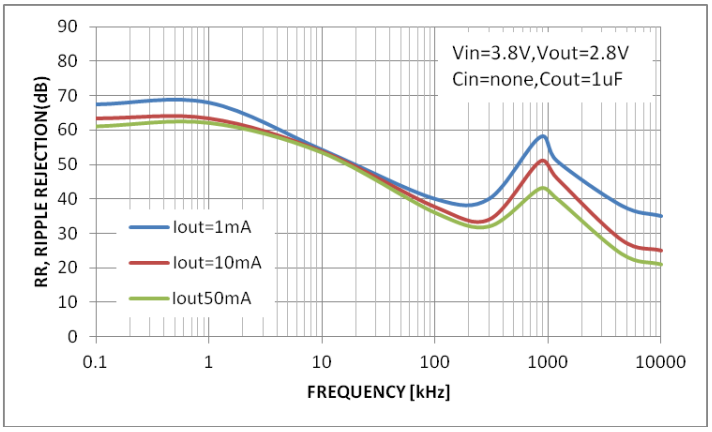
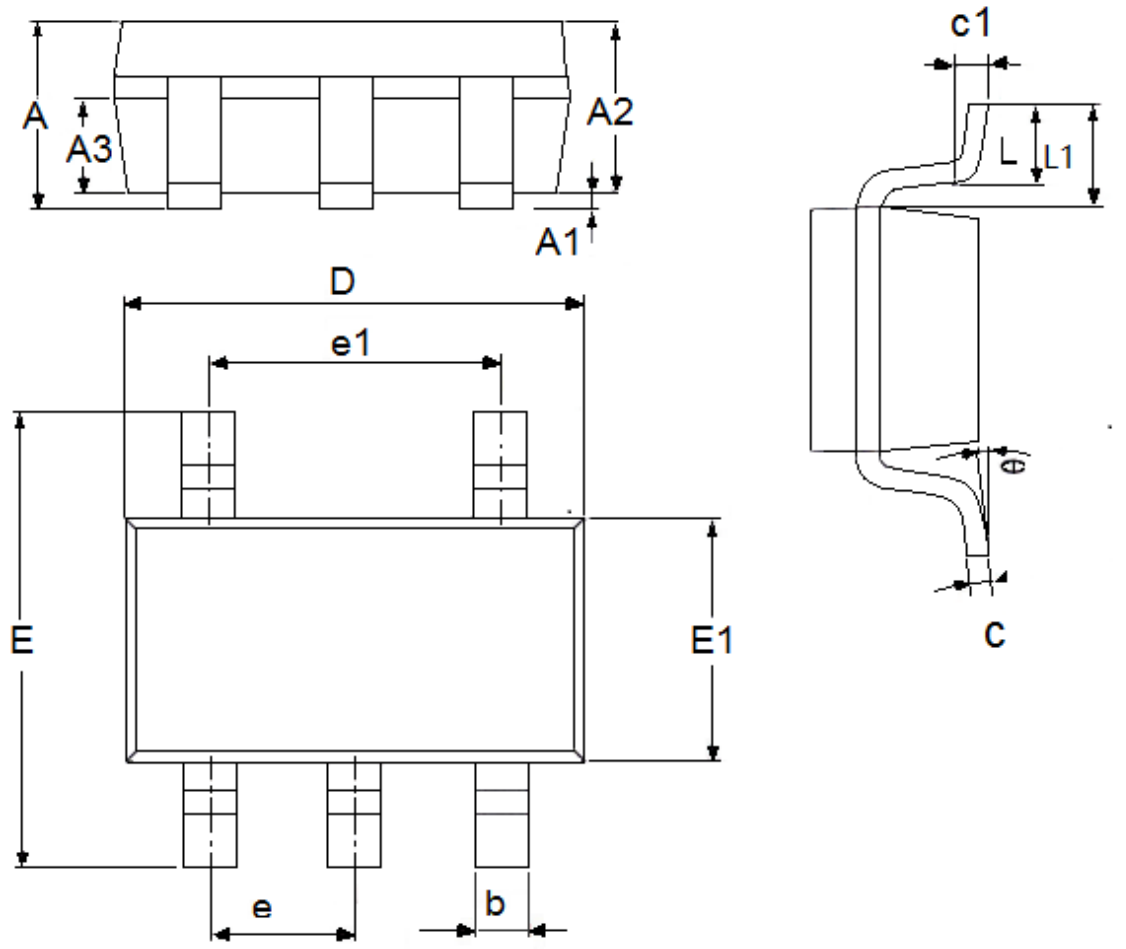


Packaging Information

- **SOT23-5**



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.23	0.0039	0.0091
D	2.82	3.05	0.1110	0.1201
e1	1.9(TYP)		0.0748(TYP)	
E	2.6	3.05	0.1024	0.1201
E1	1.5	1.75	0.0512	0.0689
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	

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