

VS6300 Series

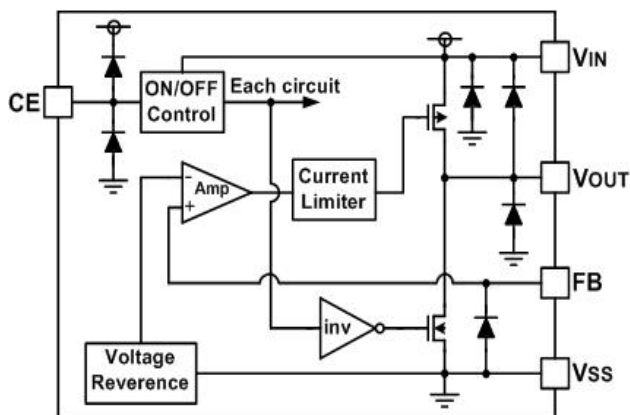
■ INTRODUCTION

The VS6300 series are a group of positive voltage regulators manufactured by CMOS technologies with high ripple rejection, ultra low noise, low power consumption and low dropout voltage, which can prolong battery life in portable electronics. The VS6300 series work with low-ESR ceramic capacitors, reducing the amount of board space necessary for power applications. The VS6300 series consume less than 0.1 μ A in shutdown mode and have fast turn-on time less than 50 μ s. The series are very suitable for the battery-powered equipments, such as RF applications and other systems requiring a quiet voltage source.

■ APPLICATIONS

- RF: VCOs, Receivers, ADCs
- Cellular and Cordless Telephones
- Handheld Organizers

■ BLOCK DIAGRAM



■ FEATURES

- 500mA RF Low-Dropout Regulator With Enable
- Ultralow-Noise: 40 μ V_{RMS}(10Hz~100kHz)
- High PSRR: 70dB@1kHz
- Fast Start-Up Time (20 μ s)
- Excellent Load/Line Transient Response
- Low Dropout Voltage: 110mV@100mA
- Stable With a 1 μ F Ceramic Capacitor
- Available in Adjustable Voltage Version (0.6V to 5.5V)
- Built-in Current Limiter, Short-Circuit Protection

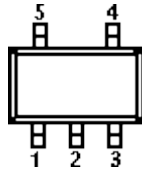
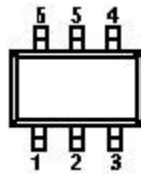
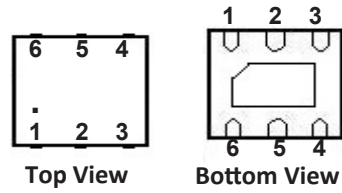
- Audio
- Bluetooth, Wireless LAN
- Tablet, MID

■ ORDER INFORMATION

VS6300 ①②

DESIGNATOR	SYMBOL	DESCRIPTION
①	B	High Active, pull-down resistor built in, with C _{OUT} discharge resistor
②	M/E	Package: SOT-23-5L/6L
	N	Package: WBHFBP-06L

PIN CONFIGURATION

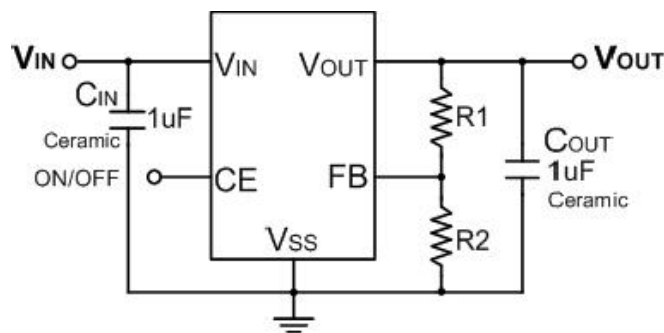
SOT-23-5L

SOT-23-6L

WBHFBP-06L

SOT-23-5L

PIN NUMBER		PIN NAME	FUNCTION
M			
1		V _{IN}	Power input Pin
2		V _{SS}	Ground
3		CE	Chip Enable Pin
4		FB	Feedback Pin: Used to Set Output Voltage
5		V _{OUT}	Output Pin

SOT-23-6L/WBHFBP-06L

PIN NUMBER		PIN NAME	FUNCTION
E	N		
1	3	V_{IN}	Power input Pin
2	2	V_{SS}	Ground
3	1	CE	Chip Enable Pin
5	6	FB	Feedback Pin: Used to Set Output Voltage
6	4	V_{OUT}	Output Pin
4	5	NC	Not Connection
-	7		Thermal Pad

TYPICAL APPLICATION


Fig.1 Typical Application Circuit

■ ABSOLUTE MAXIMUM RATINGS

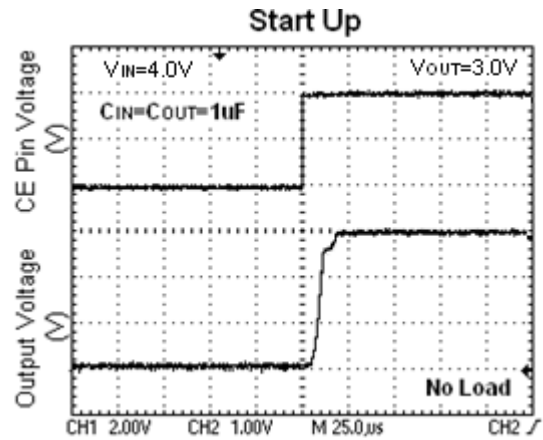
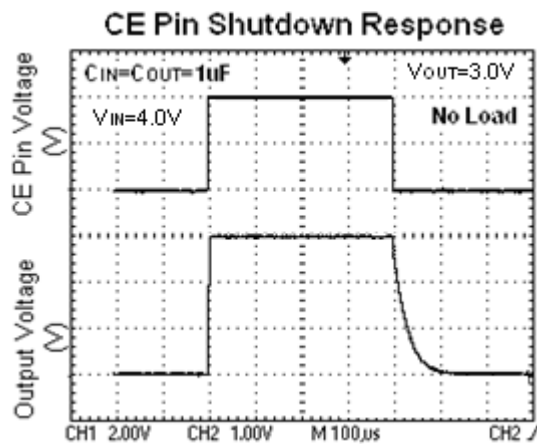
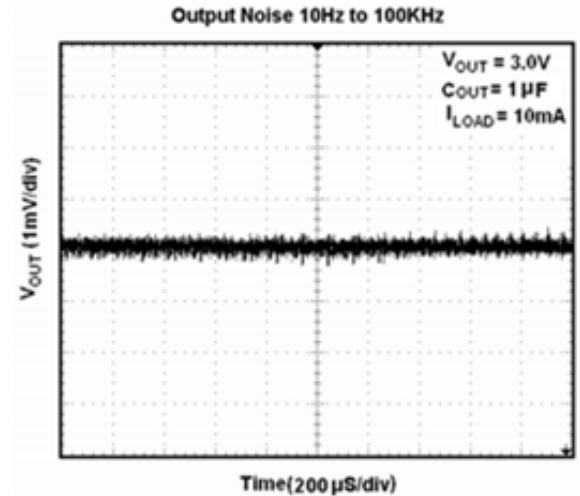
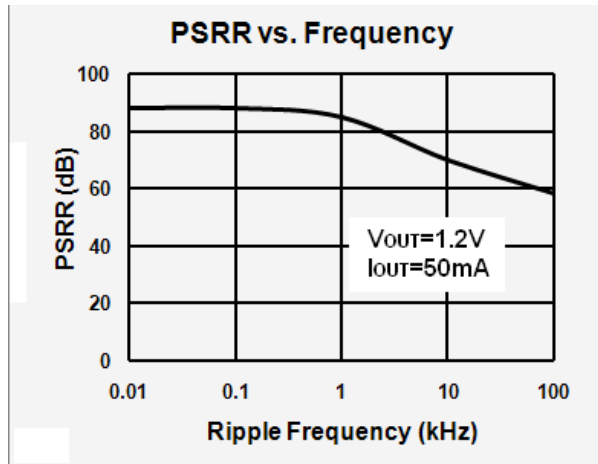
(Unless otherwise specified, $T_A=25^{\circ}\text{C}$)

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage		V_{IN}	$V_{SS} - 0.3 \sim V_{SS} + 8$	V
Output Current		I_{OUT}	750	mA
Output Voltage		V_{OUT}	$V_{SS} - 0.3 \sim V_{IN} + 0.3$	V
Power Dissipation	SOT-23-5L	P_d	400	mW
	SOT-23-6L	P_d	400	mW
	WBHFBP-06L	P_d	300	mW
Operating Ambient Temperature		T_A	$-40 \sim +85$	$^{\circ}\text{C}$
Operating Junction Temperature		T_J	$-40 \sim +125$	$^{\circ}\text{C}$
Storage Temperature		T_{stg}	$-40 \sim +125$	$^{\circ}\text{C}$
Soldering Temperature & Time		T_{solder}	$260^{\circ}\text{C}, 10\text{s}$	

■ ELECTRICAL CHARACTERISTICS

($V_{IN}=V_{OUT}+1\text{V}$, $C_{IN}=C_{OUT}=1\mu\text{F}$, $T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Input Voltage		V _{IN}	—	1.8 ⁽¹⁾		7.0	V
Output Current		I _{OUT}	V _{OUT} ≥ 1.8V	500			mA
Supply Current		I _{SS}	I _{OUT} =0mA		45	80	μA
Standby Current		I _{STBY}	V _{CE} =0V			0.1	μA
CE "High" Voltage		V _{CEH}		1.2		V _{IN}	V
CE "Low" Voltage		V _{CEL}				0.3	V
CE pin current			V _{CE} =0V	-1		1	μA
FB Voltage		V _{FB}	I _{OUT} =1mA	0.588	0.600	0.612	V
FB pin current			V _{FB} =1.8V			1	μA
Output voltage range				0.6		5.5 – V _{DO}	V
Line Regulation		$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$	I _{OUT} =10mA V _{OUT} +1V≤V _{IN} ≤7V		0.01	0.2	%/V
Load Regulation		ΔV _{OUT}	V _{IN} = V _{OUT} +1V, 1mA≤I _{OUT} ≤100mA		1		mV
Dropout Voltage ⁽²⁾		V _{dif}	I _{OUT} =100mA V _{OUT} ≥3.0V		110		mV
Output Voltage Temperature Characteristics		$\frac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	I _{OUT} =10mA -40≤T≤+85		50		ppm
Current Limit		I _{LIM}		600	750		mA
Short Current		I _{SHORT}	V _{OUT} =V _{SS}		20		mA
Power Supply Ripple Rejection	V _{OUT} =1.2V	PSRR	f=100Hz, I _{OUT} =50mA		80		dB
			f=1kHz, I _{OUT} =50mA		70		
			f=10kHz, I _{OUT} =50mA		50		
Output noise voltage			BW=10Hz to 100kHz, I _{OUT} =10mA		40		μV _{RMS}
Time, start-up			I _{OUT} =0mA, C _{OUT} =1μF		20		μS



■ APPLICATION INFORMATION

Setting The Output Voltage

Figure 1 shows the typical application circuit with VS6300. The external resistor sets the output voltage according to the following equation:

$$V_{OUT} = 0.6V \times \left(1 + \frac{R1}{R2}\right)$$

Table 1. Resistor select for output voltage setting

V_{OUT}	R1	R2
1.2V	30.1K	30.1K
1.5V	45.3K	30.1K
1.8V	60.4K	30.1K
2.5V	95.3K	30.1k
2.8V	110K	30.1k
3.0V	120K	30.1K
3.3V	137K	30.1K
5.0V	221K	30.1k