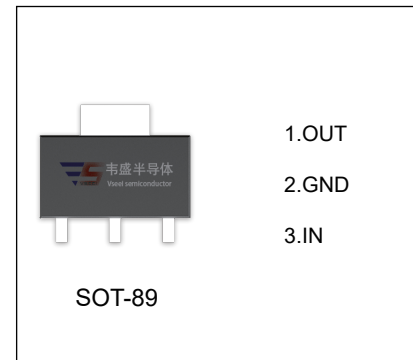


## VS78L09 Three-terminal positive voltage regulator

### FEATURES

- Maximum output current  
 $I_{OM}$ : 0.1A
- Output voltage  
 $V_O$ : 9V
- Continuous total dissipation  
 $P_D$ : 0.6 W ( $T_a = 25^\circ\text{C}$ )



### ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

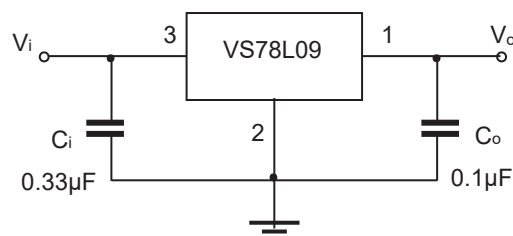
Parameter	Symbol	Value	Unit
Input Voltage	$V_i$	30	V
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	166.7	$^\circ\text{C/W}$
Operating Junction Temperature Range	$T_{OPR}$	-40~+125	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65~+150	$^\circ\text{C}$

### ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE ( $V_i=16\text{V}$ , $I_o=40\text{mA}$ , $C_i=0.33\mu\text{F}$ , $C_o=0.1\mu\text{F}$ unless otherwise specified)

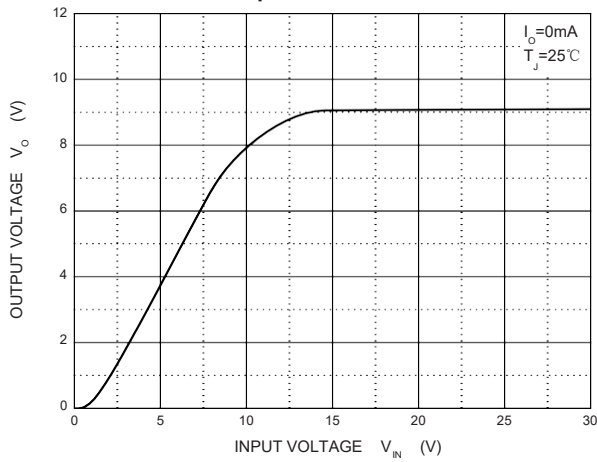
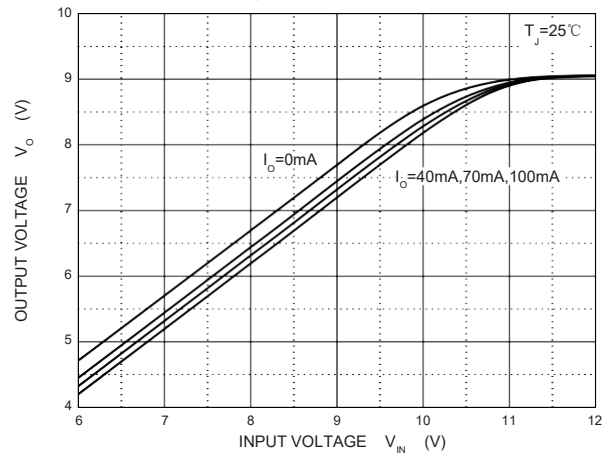
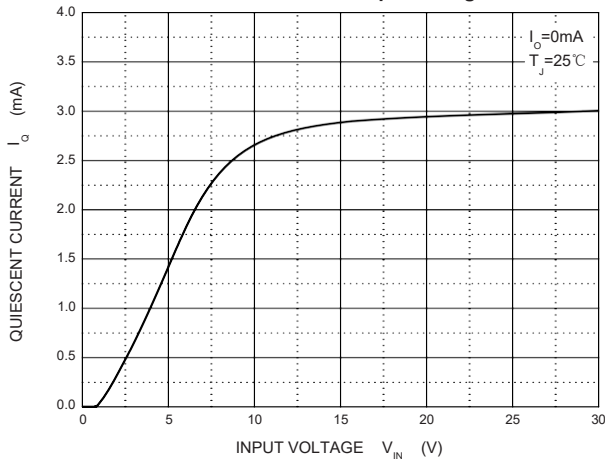
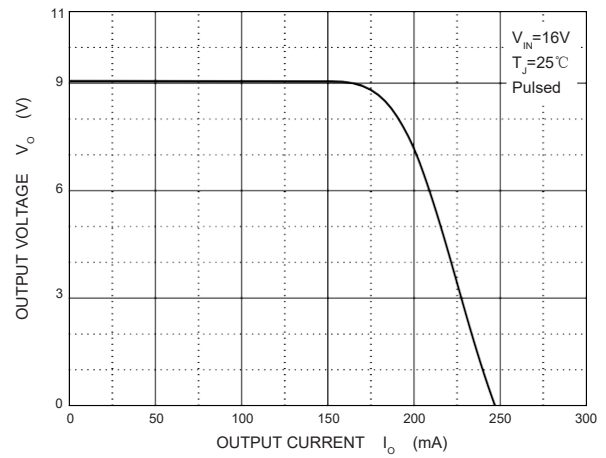
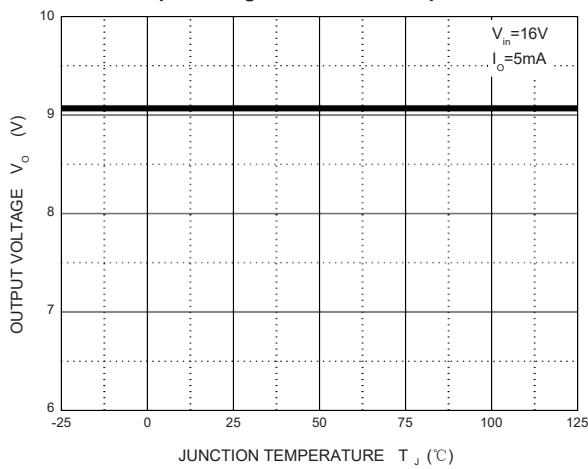
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Output voltage	$V_o$	$T_J=25^\circ\text{C}$	8.73	9.0	9.27	V
		$12\text{V} \leq V_i \leq 24\text{V}$ , $I_o=1\text{mA}-40\text{mA}$	8.55	9.0	9.45	V
		$I_o=1\text{mA}-70\text{mA}$	8.55	9.0	9.45	V
Load Regulation	$\Delta V_o$	$I_o=1\text{mA}-100\text{mA}$ , $T_J=25^\circ\text{C}$		19	90	mV
		$I_o=1\text{mA}-40\text{mA}$ , $T_J=25^\circ\text{C}$		11	40	mV
Line regulation	$\Delta V_o$	$12\text{V} \leq V_i \leq 24\text{V}$ , $T_J=25^\circ\text{C}$		45	175	mV
		$13\text{V} \leq V_i \leq 24\text{V}$ , $T_J=25^\circ\text{C}$		40	125	mV
Quiescent Current	$I_q$	$T_J=25^\circ\text{C}$		4.1	6.0	mA
Quiescent Current Change	$\Delta I_q$	$13\text{V} \leq V_i \leq 24\text{V}$			1.5	mA
	$\Delta I_q$	$1\text{mA} \leq I_o \leq 40\text{mA}$			0.1	mA
Output Noise Voltage	$V_N$	$10\text{Hz} \leq f \leq 100\text{kHz}$ , $T_J=25^\circ\text{C}$	58			$\mu\text{V}/V_o$
Ripple Rejection	RR	$15\text{V} \leq V_i \leq 25\text{V}$ , $f=120\text{Hz}$		45		dB
Dropout Voltage	$V_d$	$T_J=25^\circ\text{C}$		1.7		V

\* Pulse test.

### TYPICAL APPLICATION



Note : Bypass capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulators.

**Output Characteristics**

**Dropout Characteristics**

**Quiescent Current vs Input Voltage**

**Current Cut-off Grid Voltage**

**Output Voltage vs Junction Temperature**

**Power Derating Curve**
