



SP9718

1.5A LOW-NOISE PWM STEP-DOWN REGULATOR

DESCRIPTION

The SP9718 is low-noise pulse-width-modulated, DC-DC step-down converter. It powers logic and transmitters in small wireless systems such as cellular phones, communicating PDAs, and handy-terminals. The device features an internal synchronous rectifier for high efficiency; it requires no external Schottky diode. Excellent noise characteristics and fixed-frequency operation provide easy post-filtering. The SP9718 is ideally suited for Li-Ion battery applications. It is also useful for +3V or +5V fixed input applications.

The device operates in one of four modes. Forced PWM mode operates at a fixed frequency regardless of the load. Shutdown mode places the device in standby, reducing quiescent supply current to under 0.1 μ A.

The SP9718 can deliver over 1.5A. The output voltage can be adjusted from VREF to VIN. The input range is from 2.0V to 5.0V. Other features of the SP9718 include high efficiency, low dropout voltage. It is available in a space-saving 8-pin SOP package.

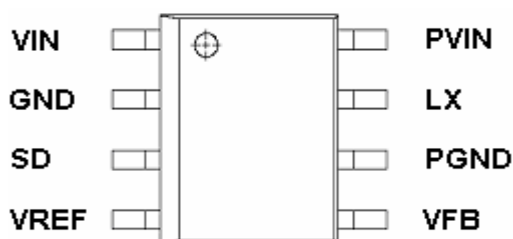
FEATURES

- 1.2MHz switching and synchronization
- Dynamic output-voltage adjustment from VREF to VIN
- 1.5A Guaranteed Output Current
- 95% Efficiency
- No Schottky Diode Required
- External Soft Start
- 8-pin PSOP power packages

APPLICATIONS

- Cellular Phone
- Cordless Phone
- PDAs and Handy-Terminals
- CPU I/O Supplies
- Notebook Chipset Supplies
- Battery Operated Devices
- ADSL

PIN CONFIGURATION (SOP-8 Power Pad)



PART MARKING

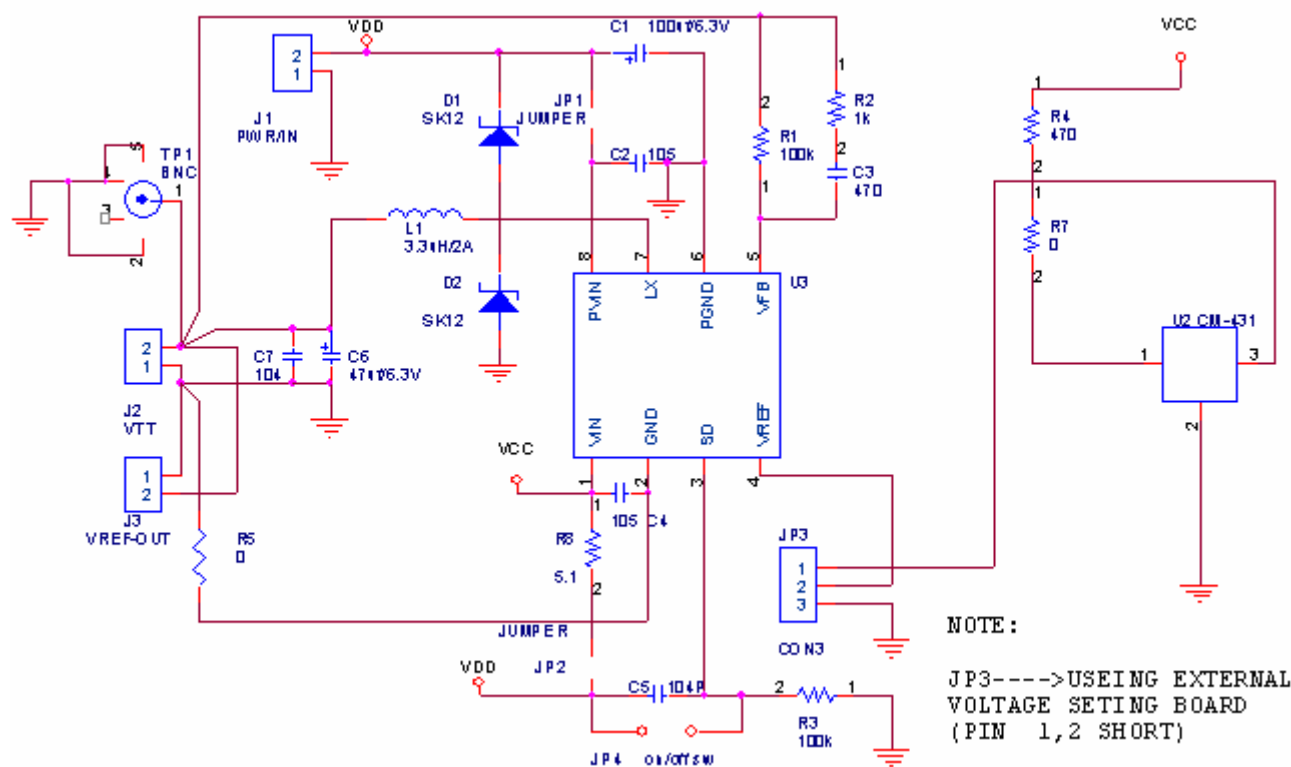




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TYPICAL APPLICATION CIRCUIT



PIN DESCRIPTION & ELECTRICAL CHARACTERISTICS

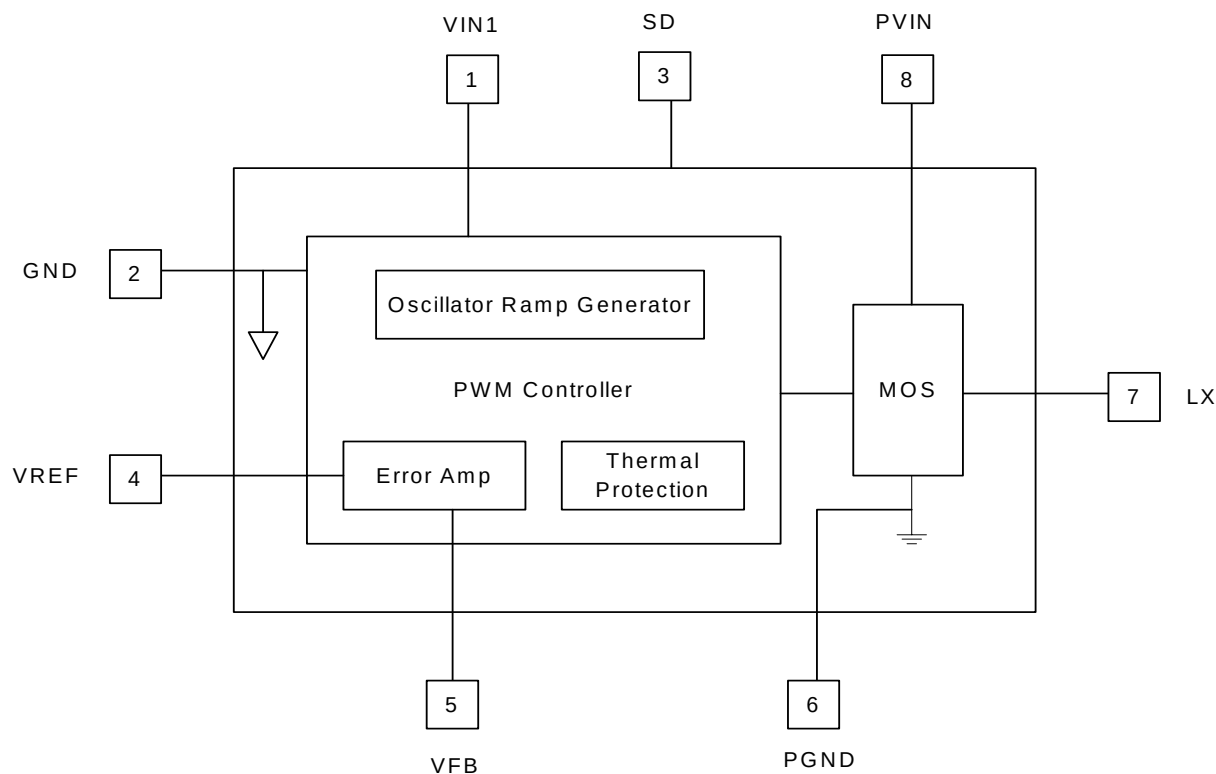
Pin	Symbol	Description	Operating Rating			
			Min.	Typ.	Max.	Unit
1	VIN	Voltage supply for internal circuits	2	2.5	5.5	V
2	GND	Ground for internal reference voltage divider				
3	SD	CMOS input level	Shutdown level		VIN + 0.3	V
		Enable level	0		2.0	
4	VREF	V _{OUT} Set Voltage	1.1		VIN	V
5	VFB	Feedback node for the V _{OUT}		VREF		V
6	PGND	Ground for output power transistors				
7	LX	Inductor connection to the Drains of the internal power MOSFETs			5.5	V
8	PVIN	Voltage supply for output power transistors	2	2.5	5.5	V



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BLOCK DIAGRAM



ORDERING INFORMATION

Part Number	Package	Part Marking
SP9718SP8RG	SOP-8 (Power Pad)	SP9718
SP9718SP8TG	SOP-8 (Power Pad)	SP9718

※ SP9718SP8RG : 7" Tape Reel ; Pb – Free

※ SP9718SP8TG : Tube ; Pb – Free

ABSOLUTE MAXIMUM RATINGS (TA=25°C, unless otherwise specified.)

The following ratings designate persistent limits beyond which damage to the device may occur.

Symbol	Parameter	Value	Unit
VIN	DC Supply Voltage	-0.3 ~ 6.0	V
PVIN	PVIN Operating Range	2.0 ~ 4.0	V
I _{OUT}	Output Current, Source or Sink	1.5	A
T _J	Operating Junction Temperature Range	150	°C
T _{STG}	Storage Temperature Range	-65 to 150	°C
T _{LEAD}	Lead Soldering Temperature for 5 sec.	260	°C
Tope	Operation Temperature Range	-40 ~ 85	°C
R _{θJC}	Thermal Resistance Junction – Case (*)	50	°C/W



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ELECTRICAL CHARACTERISTICS

(Unless otherwise stated, these specifications apply $T_A=25^{\circ}\text{C}$; $V_{\text{IN}}=+3.3\text{V}$ and $PV_{\text{IN}}=+3.3\text{V}$)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
SWITCHING REGULATOR						
V_{REF}	Adjustable Output Voltage		V_{REF}		V_{IN}	V
f_{SW}	Switching Frequency			1.2		MHz
$I_{\text{OUT(RMS)}}$	Maximum Output RMS Current				1.5	A
$I_{\text{OUT(PEAK)}}$	Maximum Output Peak Current				3	A
MOSFETs						
$R_{\text{DS(ON)}}$	Drain to Source on-State Resistance	$PV_{\text{IN}}=5\text{V}$		250		m Ω
SUPPLY						
I_{VIN}	Quiescent Current	$V_{\text{FB}} = 1.4\text{V}$ LC unconnected		220		μA
I_{PVIN}		$V_{\text{FB}} = 1.4\text{V}$ LC unconnected		500		μA

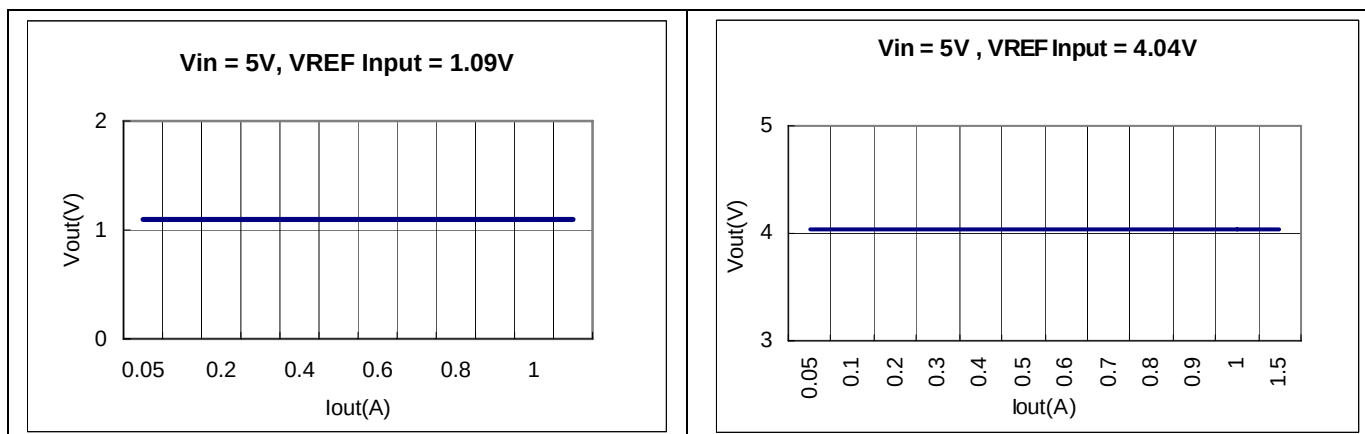


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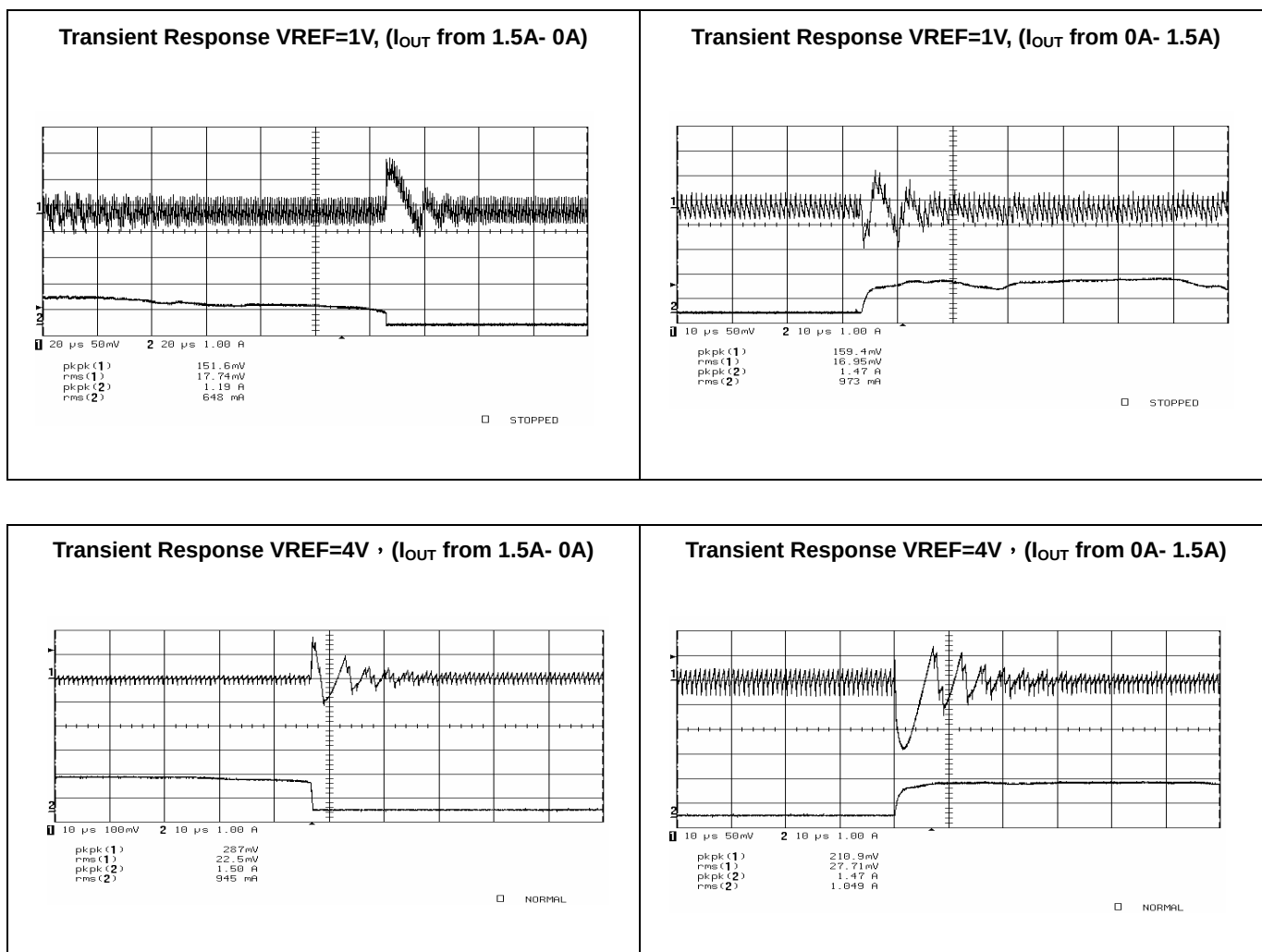
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PERFORMANCE CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, unless otherwise specified.)

LOAD REGULATION



LOAD TRANSIENT RESPONSE



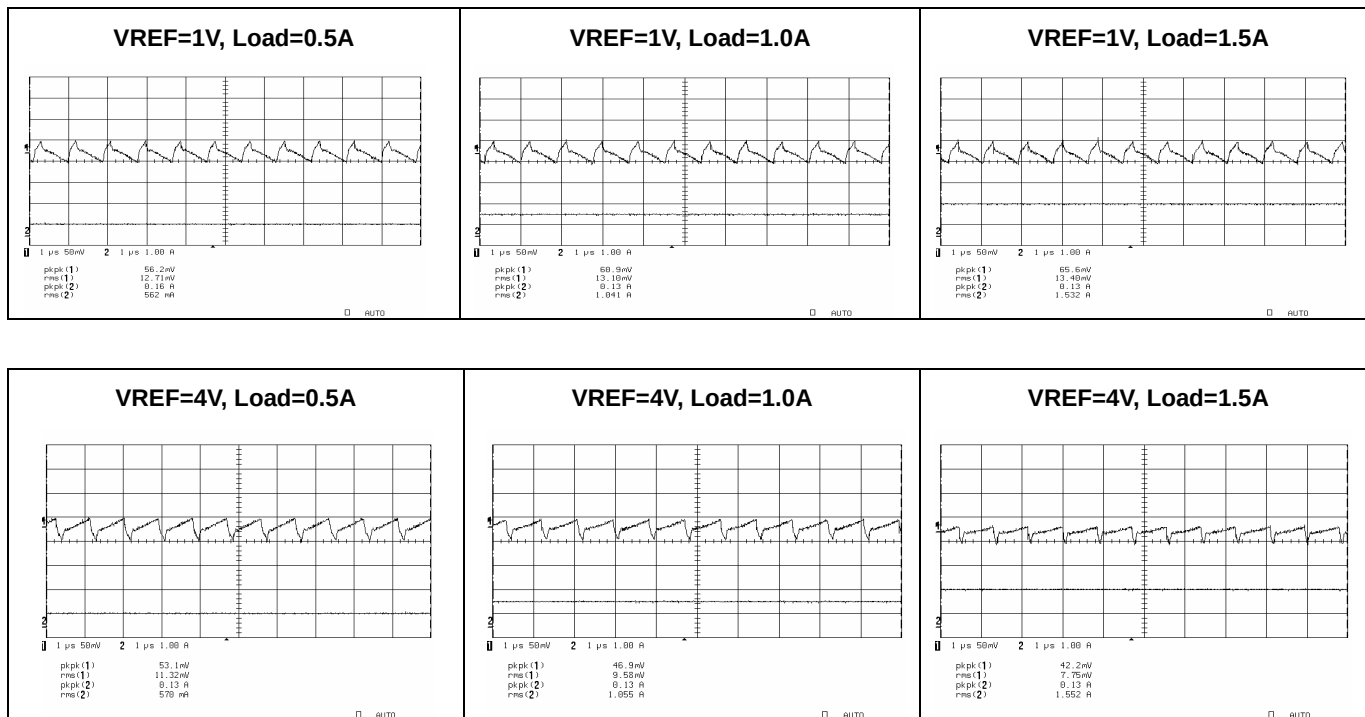


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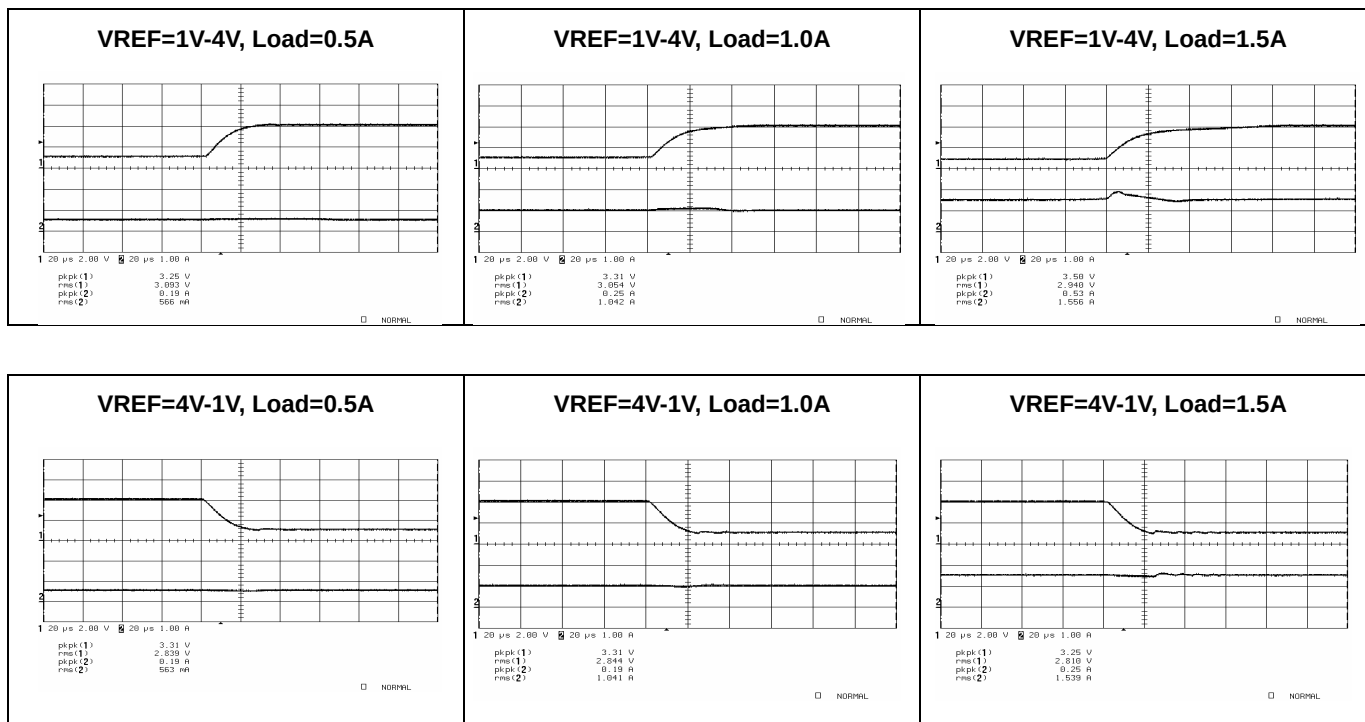
1.5A LOW-NOISE PWM STEP-DOWN REGULATOR

PERFORMANCE CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, unless otherwise specified.)

V_{OUT} OUTPUT RIPPLE AND NOISE



VOLTAGE SETTING STEP RESPONSE



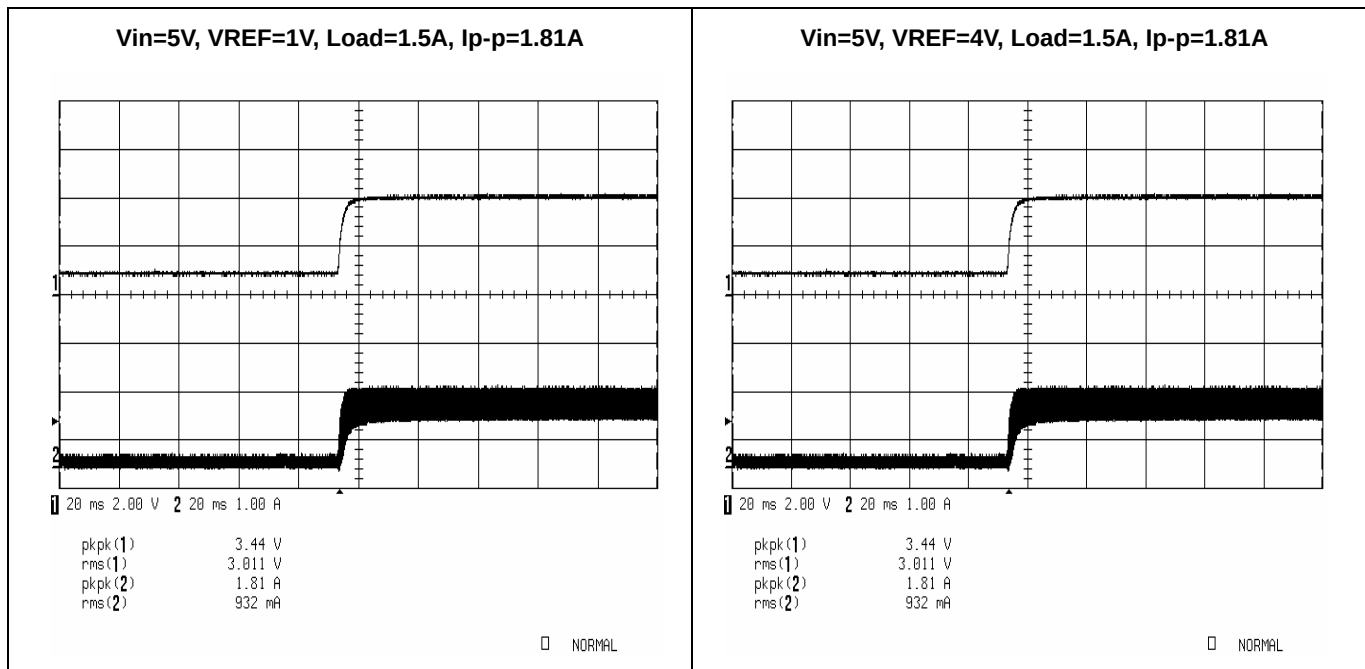


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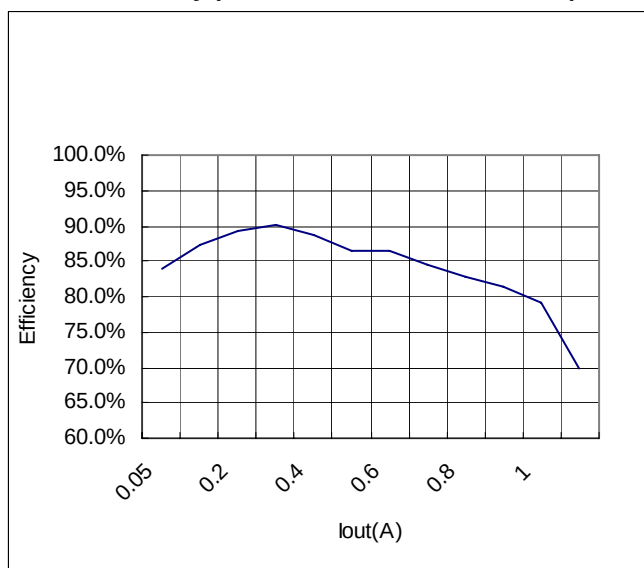
PERFORMANCE CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, unless otherwise specified.)

IN-RUSH CURRENT

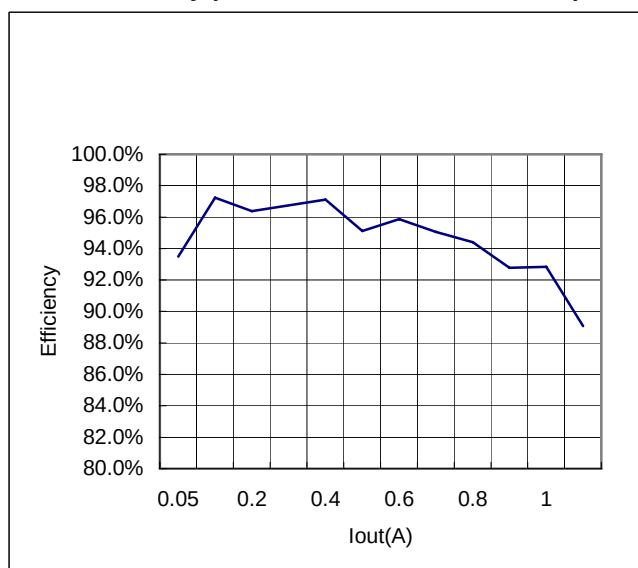


EFFICIENCY

efficiency ($V_{OUT}=1V$, load from 0.05A~1.5A)



efficiency ($V_{OUT}=4V$, load from 0.05A~1.5A)

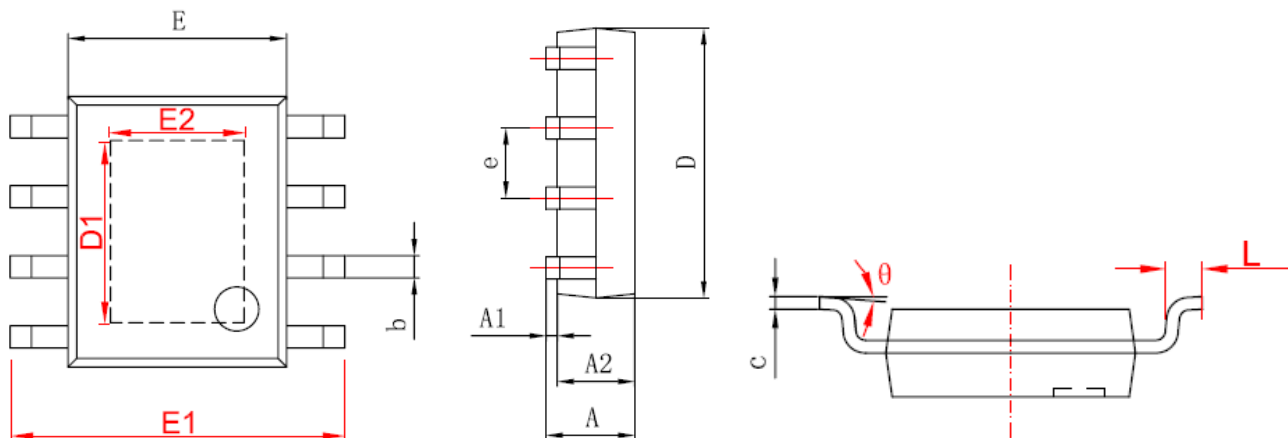




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SOP- 8 Power Pad PACKAGE OUTLINE



SYMBOLS	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.050	0.150	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
D1	3.202	3.402	0.126	0.134
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
E2	2.313	2.513	0.091	0.099
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
theta	0°	8°	0°	8°



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