

DESCRIPTION

The MP9218 is a high performance, regulated charge pump converter. Its input voltage ranges from 2.8V to V_{out} . The output voltage is regulated to a fixed 5V. No external inductor is required for simplicity and compactness. Internal soft-start circuit effectively reduces the in-rush current both while start-up and mode change.

The MP9218 is available in a compact TQFN-6 (2mmx2mm) package

FEATURES

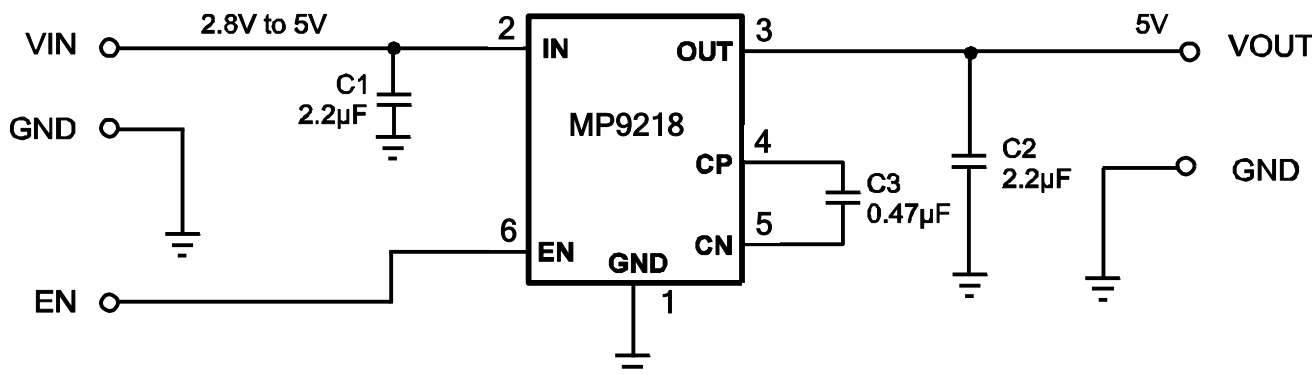
- Input Voltage Range: 2.8V to 5V
- Internal Soft-Start
- Output Maximum Current up to 110mA
- Fixed 5V Output Voltage with 30mV Ripple
- 2X Charge Pump
- Fixed 1.35MHz Switching Frequency
- Over Current Protection
- Short Circuit Protection
- In-rush Current limit
- TQFN-6 (2mmx2mm) package and Lead (pb)-Free

APPLICATIONS

- Cell phone, Smart phone
- PDA or hand Held Computer
- LCD Display Supply
- TV-Remote Control

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TYPICAL APPLICATION



ORDERING INFORMATION

Part Number	Package	Top Marking
MP9218DGT*	TQFN-6(2mm*2mm)	See Below

* For Tape & Reel, add suffix -Z (e.g. MP9218DGT-Z)
For RoHS compliant packaging, add suffix -LF (e.g. MP9218DGT-LF-Z)

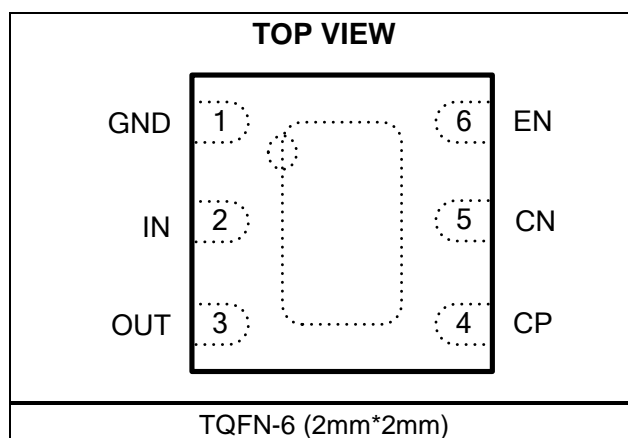
TOP MARKING

DEY

LLL

DE: product code of MP9218DGT;
Y: year code;
LLL: lot number;

PACKAGE REFERENCE



ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

Supply Input Voltage..... -0.3V to +6.0V
All Other Pins..... -0.3V to +6.0V
Continuous Power Dissipation ($T_A = +25^\circ\text{C}$) ⁽²⁾
.....1.56W
Storage Temperature..... -65°C to $+150^\circ\text{C}$
Junction Temperature..... $+150^\circ\text{C}$
Lead Temperature $+260^\circ\text{C}$

Recommended Operating Conditions ⁽³⁾

Supply Voltage V_{IN} 2.8V to 5.0V
Output Voltage V_{OUT}5.0V
Operating Junction Temp. (T_J). -40°C to $+125^\circ\text{C}$

Thermal Resistance ⁽⁴⁾ θ_{JA} θ_{JC}

TQFN-6 (2mmx2mm).....8016 ... $^\circ\text{C/W}$

Notes:

- Exceeding these ratings may damage the device.
- The maximum allowable power dissipation is a function of the maximum junction temperature $T_J(\text{MAX})$, the junction-to-ambient thermal resistance θ_{JA} , and the ambient temperature T_A . The maximum allowable continuous power dissipation at any ambient temperature is calculated by $P_D(\text{MAX}) = (T_J(\text{MAX}) - T_A) / \theta_{JA}$. Exceeding the maximum allowable power dissipation will cause excessive die temperature, and the regulator will go into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage.
- The device is not guaranteed to function outside of its operating conditions.
- Measured on JESD51-7, 4-layer PCB.

ELECTRICAL CHARACTERISTICS

$V_{IN}=3.7V$, $C_{IN}=C_{OUT}=2.2\mu F$, $C_P=0.22\mu F$, $T_A=25^{\circ}C$, unless otherwise noted

Parameter	Symbol	Condition	Min	Typ	Max	Units
Input Supply Voltage	V_{IN}		2.8		5	V
Output Voltage	V_{OUT}	$V_{IN}>3.2V$, $I_{OUT}<110mA$	4.8	5	5.2	V
Quiescent Current	I_Q	$I_{OUT}=0$		2	4	mA
Maximum Output Current	I_O	$V_{IN}>3.2V$	110			mA
Over Current Protection	I_{OCP}	$V_{OUT}=5V$	250	350	500	mA
Short Circuit Protection ⁽⁵⁾	I_{SHORT}			60		mA
Output Ripple ⁽⁵⁾		$I_{OUT}=60mA$		30		mV
Shut Down Current	I_{SHDN}	$V_{IN}=4.5V$, $V_{EN}<0.4V$		0.1	1	μA
Operation Frequency	F_{OSC}		1.1	1.35	1.6	MHz
Enable Voltage, High	$V_{EN} (HIGH)$		1.5			V
Enable Voltage, Low	$V_{EN} (LOW)$				0.4	V
Enable Pin Leakage	I_{EN}	$V_{EN}=5V$		0.2	1	μA

Notes:

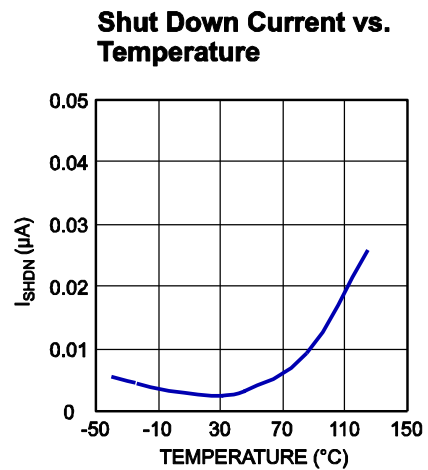
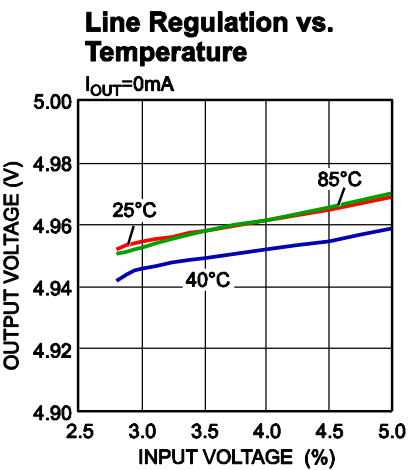
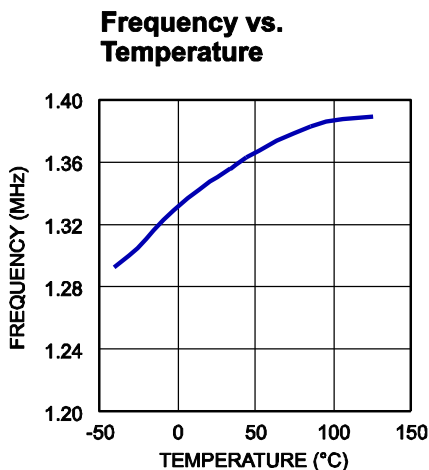
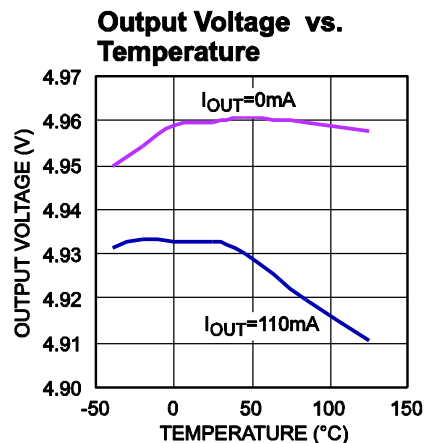
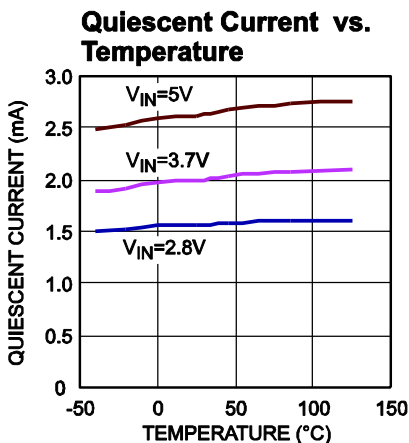
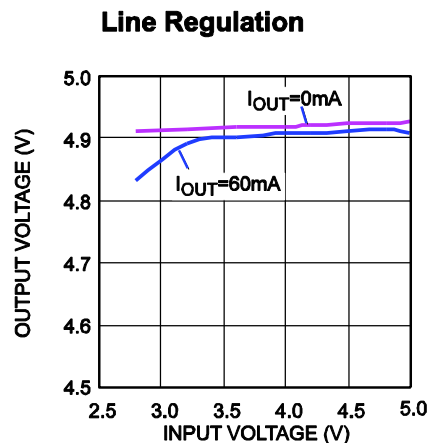
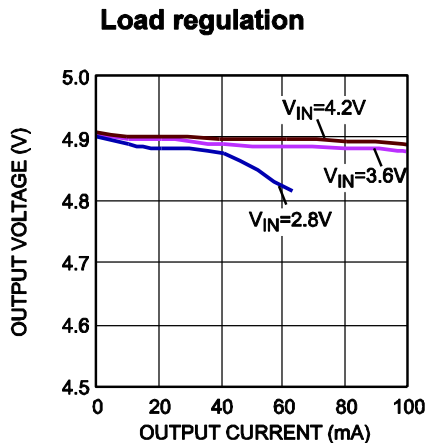
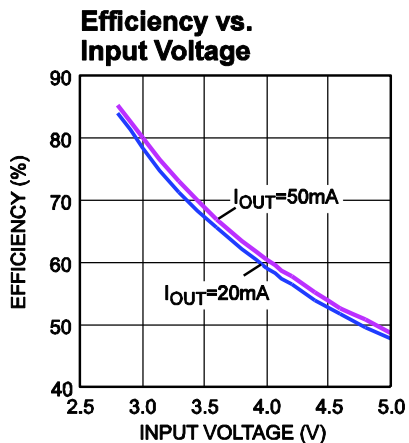
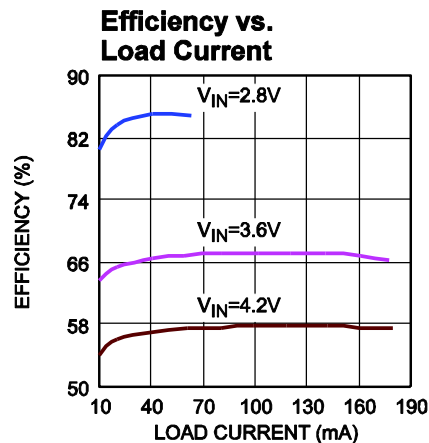
5) Guaranteed by design.

PIN FUNCTIONS

Pin #	Name	Description
1	GND	Ground.
2	IN	Input.
3	OUT	Output Voltage. Decoupled with a 2.2μF ceramic capacitor for a load current less than 60mA. For a load current greater than 60mA, use 10μF decoupling capacitor.
4	CP	Flying Capacitor Positive Terminal.
5	CN	Flying Capacitor Negative Terminal.
6	EN	Device Enable: A logic high input ($V_{EN}>1.5V$) turns on the regulator. A logic low input ($V_{EN}>0.4V$)
	Exposed Pad	Connecting to GND

TYPICAL PERFORMANCE CHARACTERISTICS

$V_{IN}=3.7V$, $V_{OUT}=5V$, $C1=C2=2.2\mu F$, $C3=0.47\mu F$, $T_A=25^\circ C$, unless otherwise noted.

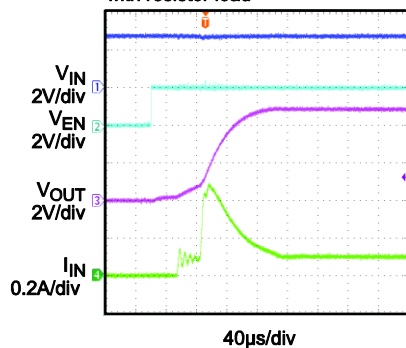


TYPICAL PERFORMANCE CHARACTERISTICS

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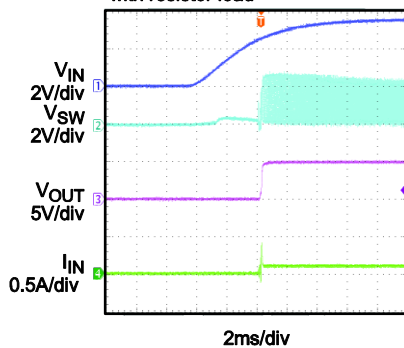
Inrush Current

$V_{IN}=2.8V$, $I_{OUT}=64mA$
with resistor load



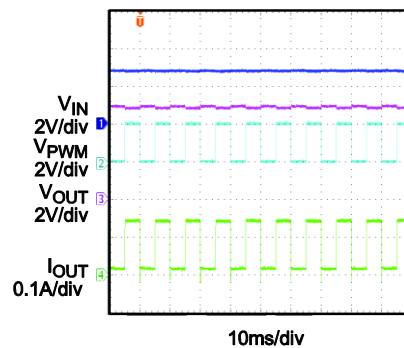
Inrush Current

$V_{GN}=V_{IN}=3.6V$, $I_{OUT}=64mA$
with resistor load



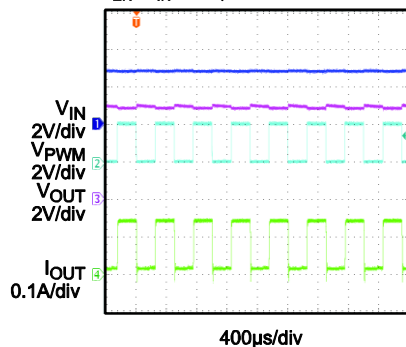
Load PWM Dimming Operation

$V_{EN}=V_{IN}=2.8V$, $F_{PWM}=100HZ$



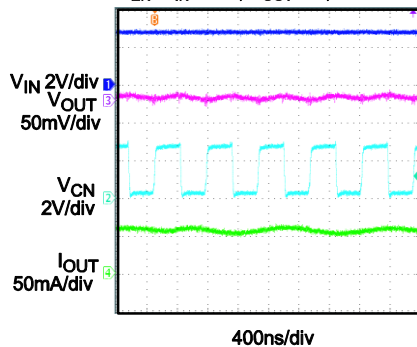
Load PWM Dimming Operation

$V_{EN}=V_{IN}=2.8V$, $F_{PWM}=2KHZ$



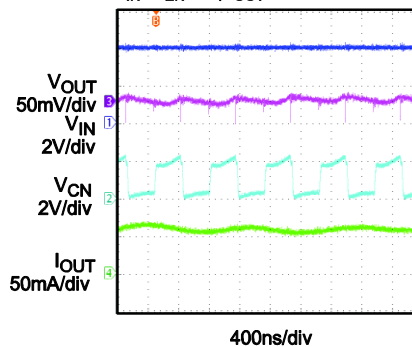
Normal Load Ripple

$V_{EN}=V_{IN}=2.8V$, $V_{OUT}=5V$, $I_{OUT}=60mA$



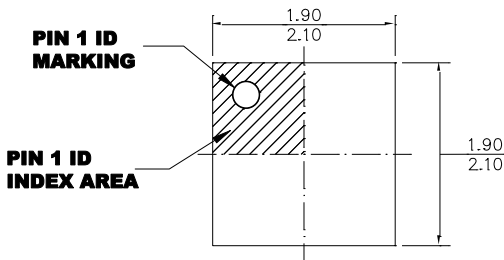
Normal Load Ripple

$V_{IN}=V_{EN}=4V$, $I_{OUT}=60mA$

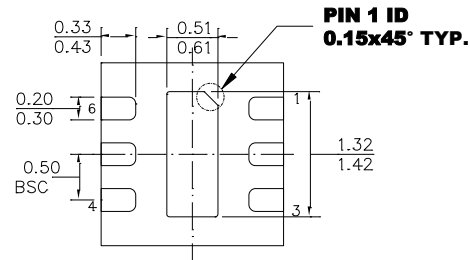


PACKAGE INFORMATION

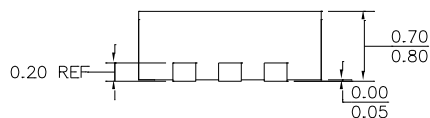
TQFN-6 (2mmx2mm)



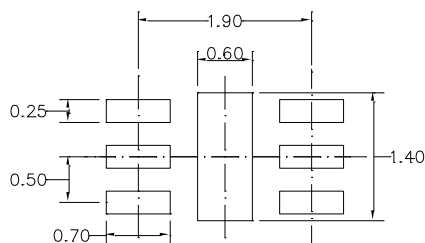
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN

NOTE:

- 1) ALL DIMENSIONS ARE IN MILLIMETERS.
- 2) EXPOSED PADDLE SIZE DOES NOT INCLUDE MOLD FLASH.
- 3) LEAD COPLANARITY SHALL BE 0.10 MILLIMETERS MAX.
- 4) JEDEC REFERENCE IS MO-229,VARIATION WCCC
- 5) DRAWING IS NOT TO SCALE.

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