MIC5211

Dual µCap 80 mA LDO Regulator

Features

- Stable with Low-Value Ceramic or Tantalum Capacitors
- 2.5V to 16V Input Range
- Independent Logic Controls
- Low Quiescent Current
- Low Dropout Voltage
- Mixed Voltages Available
- Tight Load and Line Regulation
- Low Temperature Coefficient
- Current and Thermal Limiting
- Reversed Input Polarity Protection
- Zero Off-Mode Current
- Dual Regulator in Tiny SOT-23 package

Applications

- Cellular Telephones
- Laptop, Notebook, and Palmtop Computers
- Battery-Powered Equipment
- Barcode Scanners
- SMPS Post Regulator/DC-to-DC Modules
- High-Efficiency Linear Power Supplies

General Description

The MIC5211 is a dual µCap 80 mA linear voltage regulator with very low dropout voltage (typically 20 mV at light loads), very low ground current (225 µA at 20 mA output current), and better than 3% initial accuracy. This dual device comes in the miniature SOT23-6 package, featuring independent logic control inputs.

The µCap regulator design is optimized to work with low-value, low-cost ceramic capacitors. The outputs typically require only 0.1 µF of output capacitance for stability.

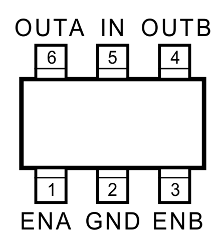
Designed especially for handheld, battery-powered devices, ground current is minimized to prolong battery life. When disabled, power consumption drops nearly to zero.

Key features include SOT23-6 packaging, current limiting, overtemperature shutdown, and protection against reversed battery conditions.

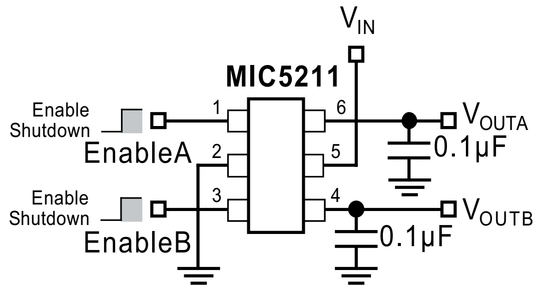
The MIC5211 is available in dual 1.8V, 2.5V, 2.7V, 2.8V, 3.0V, 3.3V, 3.6V, and 5.0V versions. Certain mixed voltages are also available. Contact Microchip for details.

Package Type

MIC5211
SOT23-6 (M6)
(Top View)



Typical Application Circuit



1.0 ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings †

Supply Input Voltage (V_{IN}) .... –20V to +20V
Enable Input Voltage (V_{EN}) .... –20V to +20V
Power Dissipation (P_D) .... Internally Limited
ESD Rating .... Note 1

Operating Ratings ††

Supply Input Voltage (V_{IN}) .... 2.5V to +16V
Enable Input Voltage (V_{EN}) .... 0V to +16V

† Notice: Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational sections of this specification is not intended. Exposure to maximum rating conditions for extended periods may affect device reliability.

†† Notice: The device is not guaranteed to function outside its operating ratings.

Note 1: Devices are ESD sensitive. Handling precautions are recommended.

ELECTRICAL CHARACTERISTICS

Electrical Characteristics: V_{IN}= V_{OUT} + 1V; I_L = 1 mA; C_L = 0.1 µF, and V_{EN} ≥ 2.0V; T_J = 25°C, **bold** values indicate –40°C to +125°C (except V_R = 1.8V; 0°C to +125°C); for one-half of dual MIC5211; unless noted.

Parameters	Symbol	Min.	Typ.	Max.	Units	Conditions
Output Voltage Accuracy	V_O	–3	—	3	%	Variation from nominal V_{OUT}
		–4	—	**4**	%	
Output Voltage Temperature Coefficient	$\Delta V_O/\Delta T$	—	**50**	**200**	ppm/°C	Note 1
Line Regulation	$\Delta V_O/V_O$	—	0.008	0.3	%	V_{IN} = V_{OUT} + 1V to 16V
		—	—	**0.5**	%	
Load Regulation	$\Delta V_O/V_O$	—	0.08	0.3	%	I_L = 0.1 mA to 50 mA, Note 2
		—	—	**0.5**	%	
Dropout Voltage	$V_{IN} – V_O$	—	20	—	mV	I_L = 100 µA, Note 3
		—	200	**450**	mV	I_L = 20 mA, Note 3
		—	250	**500**	mV	I_L = 50 mA, Note 3
Quiescent Current	I_Q	—	0.01	**10**	—	V_{EN} ≤ 0.4V (shutdown)
Ground Pin Current	I_{GND}	—	90	—	µA	V_{EN} ≥ 2.0V, I_L = 100 µA (active), Note 4
		—	225	**450**	µA	I_L = 20 mA (active), Note 4
		—	750	**1200**	µA	I_L = 50 mA (active), Note 4
Current Limit	I_{LIMIT}	—	140	**250**	mA	V_{OUT} = 0V
Thermal Regulation	$\Delta V_O/\Delta P_D$	—	0.05	—	%/W	Note 5

ELECTRICAL CHARACTERISTICS (CONTINUED)

Electrical Characteristics: V_{IN}= V_{OUT} + 1V; I_L = 1 mA; C_L = 0.1 µF, and V_{EN} ≥ 2.0V; T_J = 25°C, **bold** values indicate –40°C to +125°C (except V_R = 1.8V; 0°C to +125°C); for one-half of dual MIC5211; unless noted.						
Parameters	**Symbol**	**Min.**	**Typ.**	**Max.**	**Units**	**Conditions**
Enable Input						
Enable Input Voltage Level	V_{IL}	—	—	**0.6**	V	Logic low (off)
	V_{IH}	**2.0**	—	—		Logic high (on)
Enable Input Current	I_{IL}	—	0.01	**1**	µA	V_{IL} ≤ 0.6V
	I_{IH}	—	3	**50**		V_{IH} ≥ 2.0V

1: Output voltage temperature coeffiecient is defined as the worst case voltage change divided by the total temperature range.

2: Regulation is measured at constant junction temperature using low duty cycle pulse testing. Parts are tested for load regulation in the load range from 0.1 mA to 50 mA. Changes in output voltage due to heating effects are covered by the thermal regulation specification.

3: Dropout voltage is defined as the input to output differential at which the output voltage drops 2% below its nominal value measured at 1V differential. For output voltages below 2.5V, dropout voltage is the input-to-output voltage differential with the minimum voltage being 2.5V. Minimum input operating voltage is 2.5V.

4: Ground pin current is the regulator quiescent current plus pass transistor base current. The total current drawn from the supply is the sum of the load current plus the ground pin current.

5: Thermal regulation is defined as the change in output voltage at a time “t” after a change in power dissipation is applied, excluding load or line regulation effects. Specifications are for a 50 mA load pulse at V_{IN} = 16V for t = 10 ms.

TEMPERATURE SPECIFICATIONS (Note 1)

Parameters	Symbol	Min.	Typ.	Max.	Units	Conditions
Temperature Ranges						
Storage Temperature Range	T_A	–60	—	+150	°C	—
Lead Temperature	T_J	—	—	+260	°C	Soldering, 5 sec.
Junction Temperature	T_J	–40	—	+125	°C	Except 1.8V option
Junction Temperature	T_J	0	—	+125	°C	For 1.8V option
Package Thermal Resistance						
Thermal Resistance, SOT23-6	θ_{JA}	—	220	—	°C/W	Note 2

Note 1: The maximum allowable power dissipation is a function of ambient temperature, the maximum allowable junction temperature and the thermal resistance from junction to air (i.e., T_A, T_J, θ_{JA}). Exceeding the maximum allowable power dissipation will cause the device operating junction temperature to exceed the maximum +125°C rating. Sustained junction temperatures above +125°C can impact the device reliability.

2: The maximum allowable power dissipation of any T_A (ambient temperature) is $P_{D(MAX)} = (T_{J(MAX)} – T_A)/\theta_{JA}$. Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into thermal shutdown.

2.0 TYPICAL PERFORMANCE CURVES

Note:	The graphs and tables provided following this note are a statistical summary based on a limited number of samples and are provided for informational purposes only. The performance characteristics listed herein are not tested or guaranteed. In some graphs or tables, the data presented may be outside the specified operating range (e.g., outside specified power supply range) and therefore outside the warranted range.

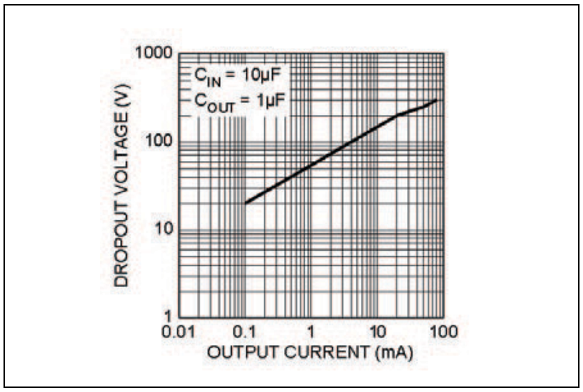


FIGURE 2-1: *Dropout Voltage vs. Output Current.*

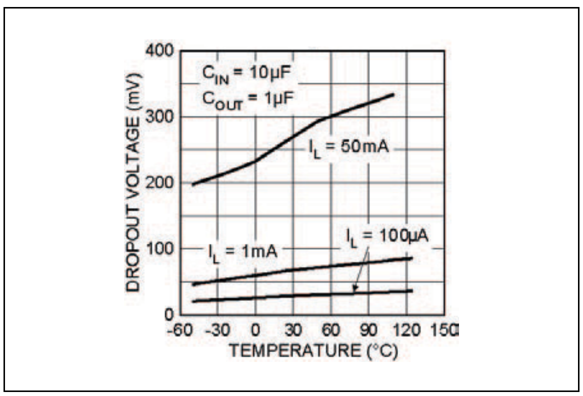


FIGURE 2-2: *Dropout Voltage vs. Temperature.*

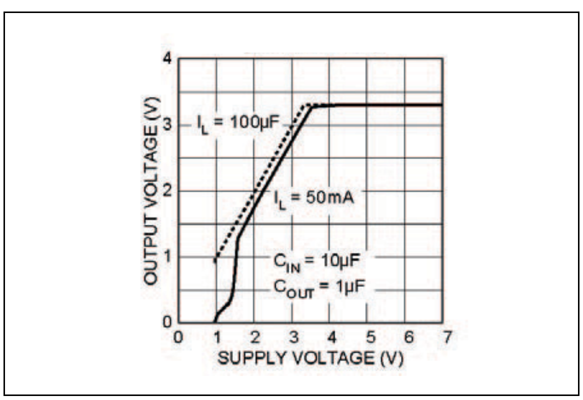


FIGURE 2-3: *Dropout Characteristics (MIC5211-3.3).*

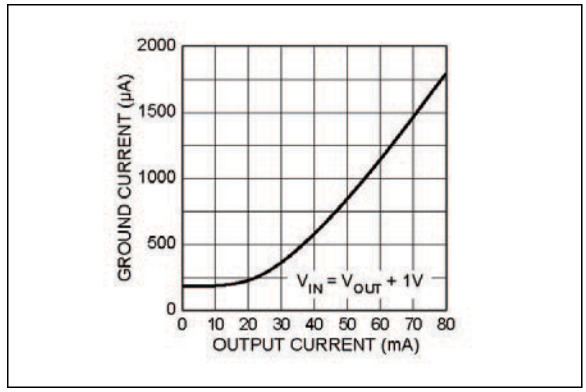


FIGURE 2-4: *Ground Current vs. Output Current.*

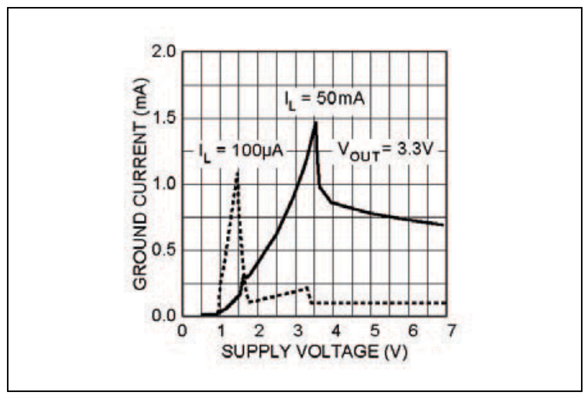


FIGURE 2-5: *Ground Current vs. Supply Voltage.*

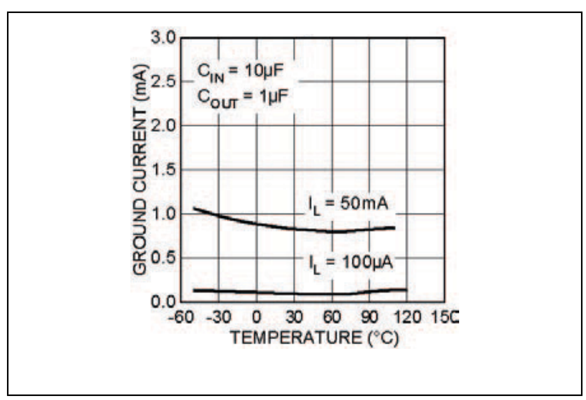


FIGURE 2-6: *Ground Current vs. Temperature.*

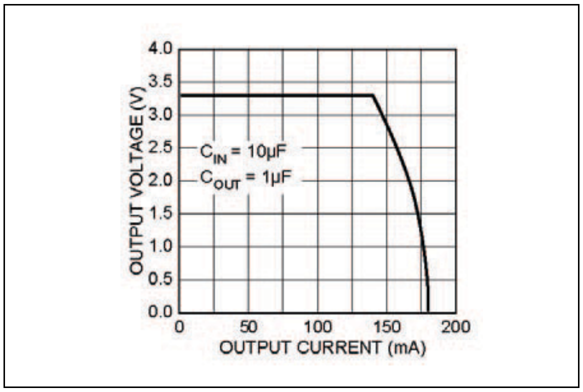


FIGURE 2-7: *Output Voltage vs. Output Current.*

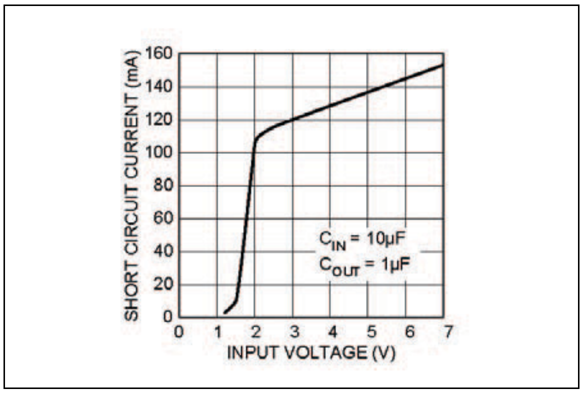


FIGURE 2-8: *Short Circuit Current vs. Input Voltage.*

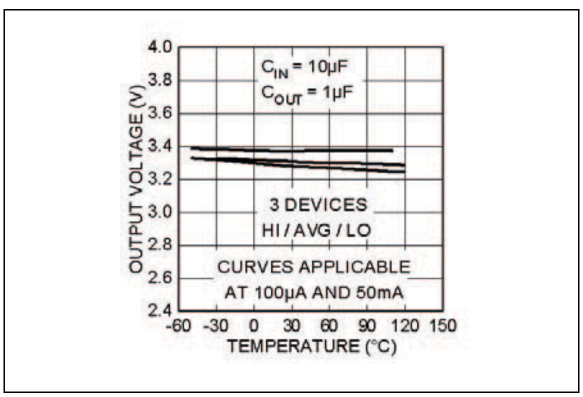


FIGURE 2-9: *Output Voltage vs. Temperature.*

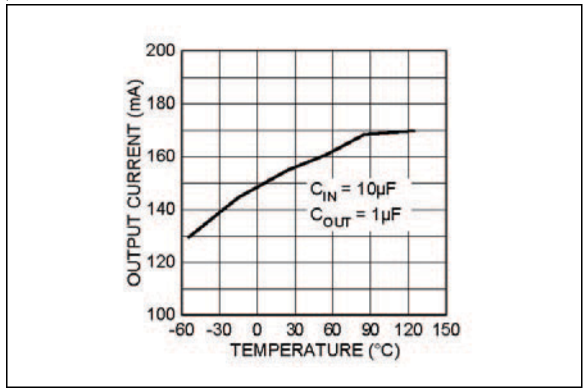


FIGURE 2-10: *Short Circuit Current vs. Temperature.*

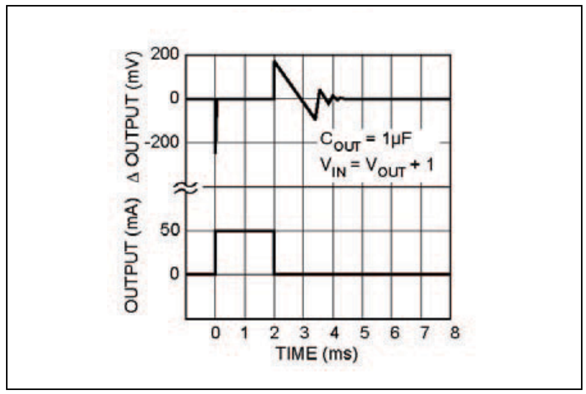


FIGURE 2-11: *Load Transient.*

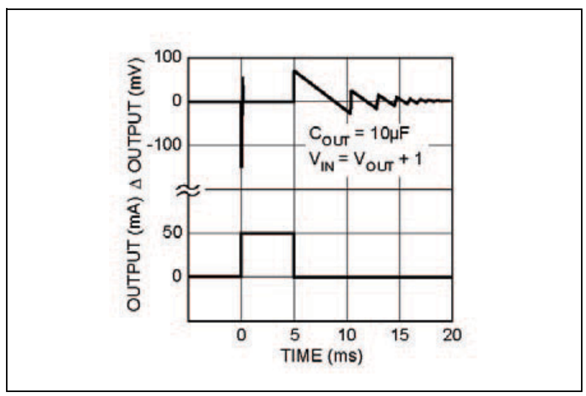


FIGURE 2-12: *Load Transient.*

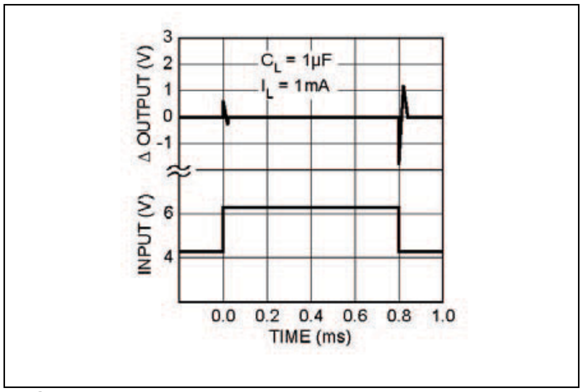


FIGURE 2-13: *Line Transient (MIC5211-3.3).*

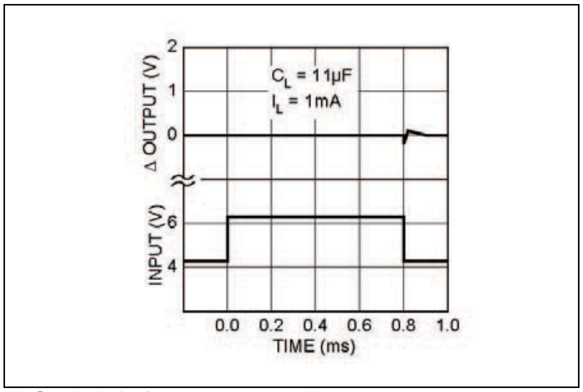


FIGURE 2-14: *Line Transient (MIC5211-3.3).*

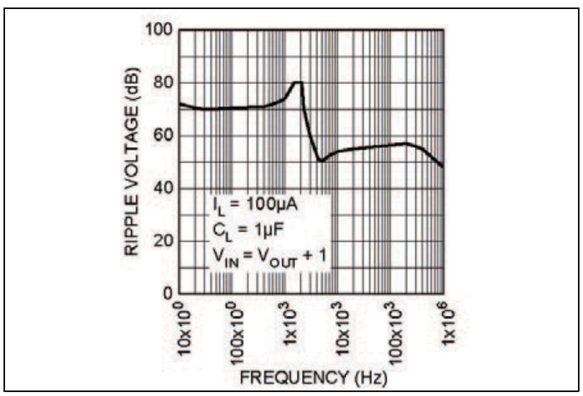


FIGURE 2-15: *Ripple Voltage vs. Frequency.*

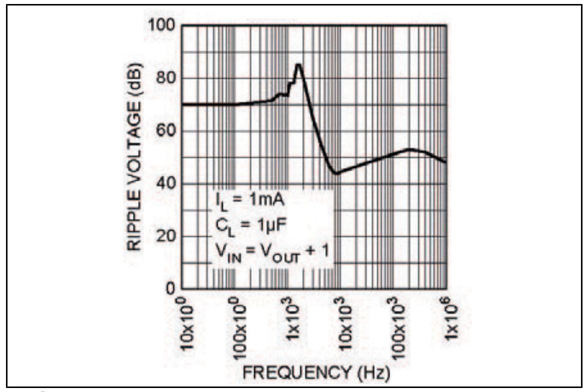


FIGURE 2-16: *Ripple Voltage vs. Frequency.*

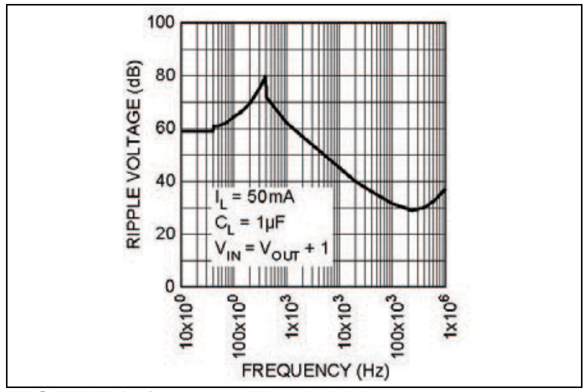


FIGURE 2-17: *Ripple Voltage vs. Frequency.*

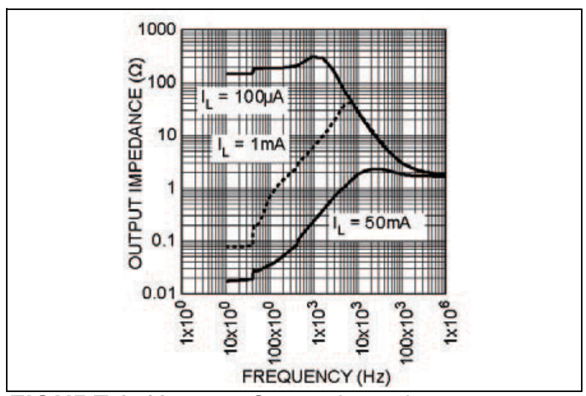


FIGURE 2-18: *Output Impedance.*

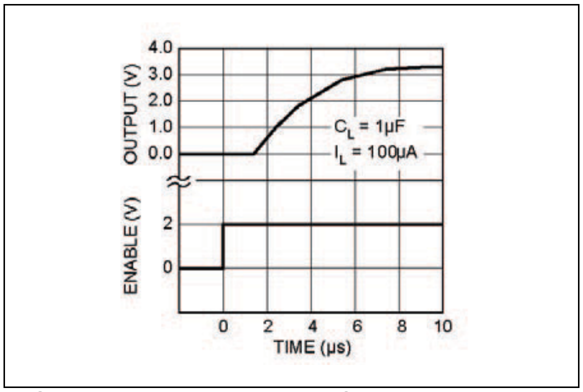


FIGURE 2-19: *Enable Characteristics (MIC5211-3.3).*

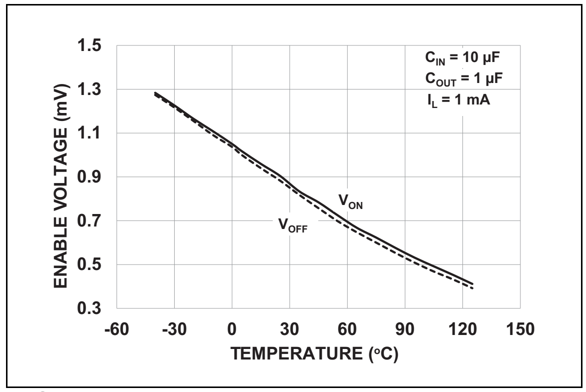


FIGURE 2-22: *Enable Voltage vs. Temperature.*

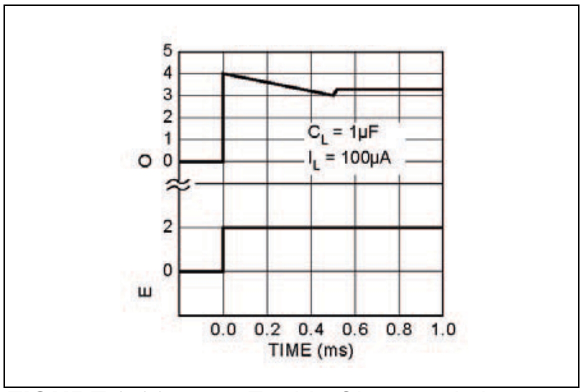


FIGURE 2-20: *Enable Characteristics (MIC5211-3.3).*

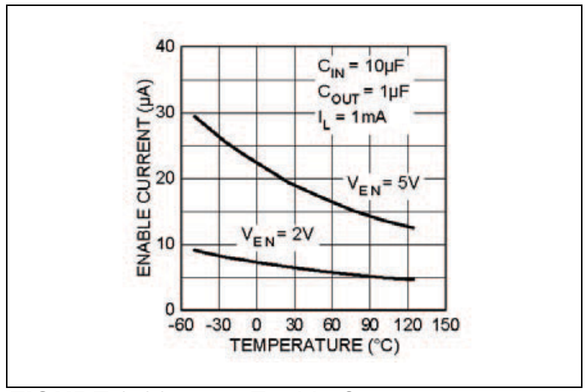


FIGURE 2-23: *Enable Current vs. Temperature.*

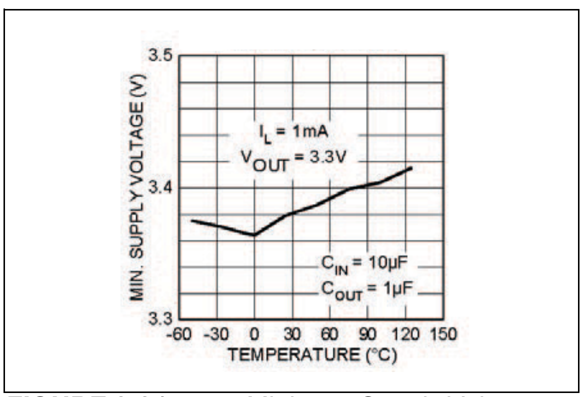


FIGURE 2-21: *Minimum Supply Voltage vs. Temperature.*

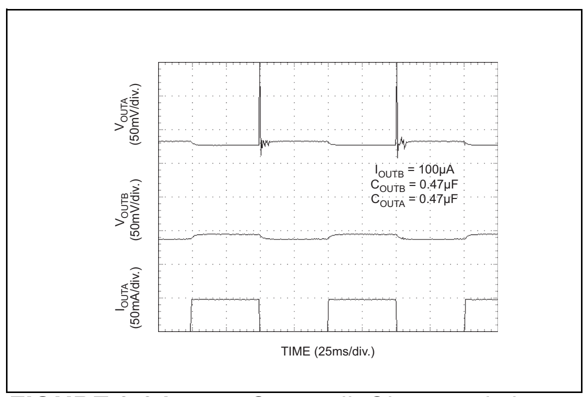


FIGURE 2-24: *Crosstalk Characteristics*

3.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in Table 3-1.

TABLE 3-1: PIN FUNCTION TABLE

Pin Number	Pin Name	Description
1	ENA	Enable/Shutdown A (Input): CMOS compatible input. Logic high = enable, logic low or open = shutdown.
2	GND	Ground.
3	ENB	Enable/Shutdown B (Input): CMOS compatible input. Logic high = enable, logic low or open = shutdown.
4	OUTB	Regulator Output B.
5	IN	Supply Input.
6	OUTA	Regulator Output A.

4.0 APPLICATIONS INFORMATION

4.1 Enable/Shutdown

ENA and ENB (enable/shutdown) may be controlled separately. Forcing ENA/B high (>2V) enables the regulator. The enable inputs typically draw only 15 µA.

While the logic threshold is TTL/CMOS compatible, ENA/B may be forced as high as 20V, independent of V_{IN}. ENA/B may be connected to the supply if the function is not required.

4.2 Input Capacitor

A 0.1 µF capacitor should be placed from IN to GND if there is more than 10 inches of wire between the input and the AC filter capacitor or when a battery is used as the input.

4.3 Output Capacitor

Typical PNP-based regulators require an output capacitor to prevent oscillation. The MIC5211 is ultra-stable, requiring only 0.1 µF of output capacitance per regulator for stability. The regulator is stable with all types of capacitors, including the tiny, low ESR ceramic chip capacitors. The output capacitor value can be increased without limit to improve transient response.

The capacitor should have a resonant frequency above 500 kHz. Ceramic capacitors work, but some dielectrics have poor temperature coefficients, which will affect the value of the output capacitor over temperature. Tantalum capacitors are much more stable over temperature, but typically are larger and more expensive. Aluminum electrolytic capacitors will also work, but they have electrolytes that freeze at about –30°C. Tantalum or ceramic capacitors are recommended for operation below –25°C.

4.4 No-Load Stability

The MIC5211 will remain stable and in regulation with no load (other than the internal voltage divider) unlike many other voltage regulators. This is especially important in CMOS RAM keep-alive applications.

4.5 Thermal Shutdown

Thermal shutdown is independent on both halves of the dual MIC5211, however, an overtemperature condition in one half may affect the other half because of proximity.

4.6 Thermal Considerations

When designing with a dual low-dropout regulator, both sections must be considered for proper operation. The part is designed with thermal shutdown, therefore, the maximum junction temperature must not be exceeded. Since the dual regulators share the same substrate, the total power dissipation must be considered to avoid thermal shutdown. Simple thermal calculations based on the power dissipation of both regulators will allow the user to determine the conditions for proper operation.

The maximum power dissipation for the total regulator system can be determined using the operating temperatures and the thermal resistance of the package. In a minimum footprint configuration, the SOT23-6 junction-to-ambient thermal resistance (θ_{JA}) is 220°C/W. Because the maximum junction temperature for this device is 125°C, at an operating temperature of 25°C the maximum power dissipation is:

EQUATION 4-1:

$$P_{D(MAX)} = \frac{T_{(J(MAX))} - T_A}{\theta_{JA}}$$

$$P_{D(MAX)} = \frac{125°C - 25°C}{220°C/W}$$

$$P_{D(MAX)} = 455mW$$

The MIC5211-3.0 can supply 3V to two different loads independently from the same supply voltage. If one of the regulators is supplying 50 mA at 3V from an input voltage of 4V, the total power dissipation in this portion of the regulator is:

EQUATION 4-2:

$$P_{D1} = (V_{IN} - V_{OUT})I_{OUT} + V_{IN} \times I_{GND}$$

$$P_{D1} = (4V - 3V)50mA + 4V \times 0.85mA$$

$$P_{D1} = 53.4mW$$

Up to approximately 400 mW can be dissipated by the remaining regulator (455 mW – 53.4 mW) before reaching the thermal shutdown temperature, allowing up to 50 mA of current.

EQUATION 4-3:

$$P_{D2} = (V_{IN} - V_{OUT})I_{OUT} + V_{IN} \times I_{GND}$$

$$P_{D2} = (4V - 3V)50mA + 4V \times 0.85mA$$

$$P_{D1} = 53.4mW$$

The total power dissipation is:

EQUATION 4-4:

$$P_{D1} + P_{D2} = 53.4mW + 53.4mW$$

$$P_{D1} + P_{D2} = 106.8mW$$

Therefore, with a supply voltage of 4V, both outputs can operate safely at room temperature and full load (50 mA).

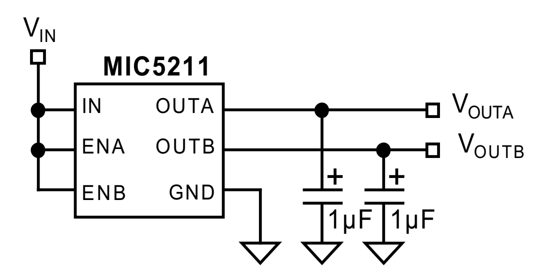


FIGURE 4-1: *Thermal Conditions Circuit.*

In many applications, the ambient temperature is much higher. By recalculating the maximum power dissipation at +70°C ambient, it can be determined if both outputs can supply full load when powered by a 4V supply.

EQUATION 4-5:

$$P_{D(MAX)} = \frac{T_{(J(MAX))} - T_A}{\theta_{JA}}$$

$$P_{D(MAX)} = \frac{125°C - 70°C}{220°C/W}$$

$$P_{D(MAX)} = 250mW$$

At +70°C, the device can provide 250 mW of power dissipation, suitable for the application above.

When using supply voltages higher than 4V, do not exceed the maximum power dissipation for the device. If the device is operating from a 7.2V nominal two-cell lithium-ion battery and both regulators are dropping the voltage to 3.0V, then output current will be limited at higher ambient temperatures.

For example, at +70°C ambient the first regulator can supply 3.0V at 50 mA output from a 7.2V supply; however, the second regulator will have limitations on output current to avoid thermal shutdown. The dissipation of the first regulator is:

EQUATION 4-6:

$$P_{D1} = (7.2V - 3V)50mA + 7.2V \times 0.85mA$$

$$P_{D1} = 216mW$$

Because maximum power dissipation for the dual regulator is 250 mW at 70°C, the second regulator can only dissipate up to 34 mW without going into thermal shutdown. The amount of current the second regulator can supply is:

EQUATION 4-7:

$$P_{D2(MAX))} = (7.2V - 3V)I_{OUT2(MAX)} = 34mW$$

$$4.2V \times I_{OUT2(MAX)} = 34mW$$

$$I_{OUT2(MAX)} = 8mA$$

The second regulator can provide up to 8 mA output current, suitable for the keep-alive circuitry often required in handheld applications.

Refer to Application Hint 17 for heat sink requirements when higher power dissipation capability is needed. Refer to Designing with Low-Dropout Voltage Regulators handbook for a more thorough discussion of regulator thermal characteristics.

4.7 Dual-Voltage Considerations

For configurations where two different voltages are needed in the system, the MIC5211 has the option of having two independent output voltages from the same input. For example, a 3.3V rail and a 5.0V rail can be supplied from the MIC5211 for systems that require both voltages. Important considerations must be taken to ensure proper functionality of the part. The input voltage must be high enough for the 5V section to operate correctly, this will ensure the 3.3V section proper operation as well.

Both regulators live off of the same input voltage, therefore the amount of output current each regulator supplies may be limited thermally. The maximum power the MIC5211 can dissipate at room temperature is 455 mW, as shown in the Thermal Considerations section. If we assume 6V input voltage and 50 mA of output current for the 3.3V section of the regulator, then the amount of output current the 5V section can provide can be calculated based on the power dissipation.

EQUATION 4-8:

$$P_D = (V_{GND} - V_{OUT})I_{OUT} + V_{GND} \times I_{GND}$$

$$P_{D(3.3V)} = (6V - 3.3V)50mA + 6V \times 0.85mA$$

$$P_{D(3.3V)} = 140.1mW$$

$$P_{D(MAX)} = 455mW$$

$$P_{D(MAX)} - P_{D(3.3V)} = P_{D(5V)}$$

Based on the power dissipation allowed for the 5V section, the amount of output current it can source is easily calculated.

EQUATION 4-9:

$$P_{D(5V)} = 455mW - 140.1mW$$

$$P_{D(5V)} = 314.9mW$$

EQUATION 4-10:

$$P_{D(5V)} = 314.9mW$$

$$314.9mW = (6V - 5V)I_{MAX} - 6V \times I_{GND}$$

I_{GND} typically adds less than 5% to the total power dissipation and in this case can be ignored.

EQUATION 4-11:

$$314.9mW = (6V - 5V)I_{MAX}$$

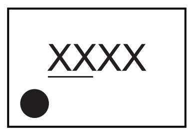
$$I_{MAX} = 314.9mA$$

I_{MAX} exceeds the maximum current rating of the device. Therefore, for this condition, the MIC5211 can supply 50 mA of output current from each section of the regulator.

5.0 PACKAGING INFORMATION

5.1 Package Marking Information

6-Lead SOT23*



Example

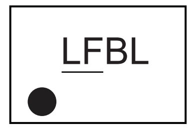


TABLE 5-1: MARKING CODES

Part Number	Marking Code	Voltage Side A/Side B	Temperature Range
MIC5211-1.8YM6	LFBB	1.8V	0°C to +125°C
MIC5211-2.5YM6	LFCC	2.5V	–40°C to +125°C
MIC5211-2.7YM6	LFDD	2.7V	–40°C to +125°C
MIC5211-2.8YM6	LFEE	2.8V	–40°C to +125°C
MIC5211-3.0YM6	LFGG	3.0V	–40°C to +125°C
MIC5211-3.0YM6	LFLL	3.3V	–40°C to +125°C
MIC5211-3.6YM6	LFQQ	3.6V	–40°C to +125°C
MIC5211-5.0YM6	LFXX	5.0V	–40°C to +125°C
Dual-Voltage Regulators			
MIC5211-BCYM6	LFBC	1.8V/2.5V	0°C to +125°C
MIC5211-BLYM6	LFBL	1.8V/3.3V	0°C to +125°C
MIC5211-CLYM6	LFCL	2.5V/3.3V	–40°C to +125°C
MIC5211-LXYM6	LFLX	3.3V/5.0V	–40°C to +125°C

Legend:

XX...X	Product code or customer-specific information
Y	Year code (last digit of calendar year)
YY	Year code (last 2 digits of calendar year)
WW	Week code (week of January 1 is week ‘01’)
NNN	Alphanumeric traceability code
(e3)	Pb-free JEDEC® designator for Matte Tin (Sn)
*	This package is Pb-free. The Pb-free JEDEC designator ((e3)) can be found on the outer packaging for this package.

●, ▲, ▼ Pin one index is identified by a dot, delta up, or delta down (triangle mark).

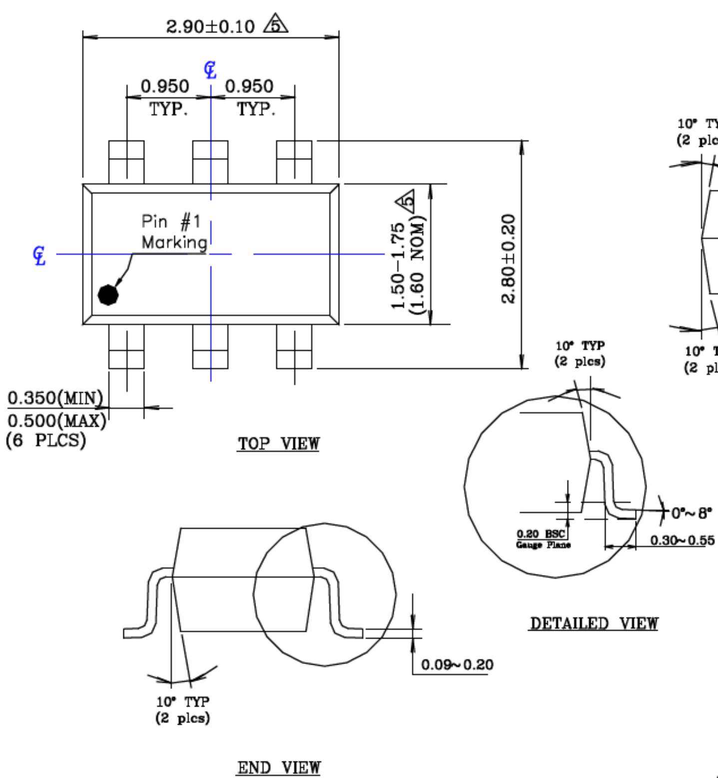
Note: In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line, thus limiting the number of available characters for customer-specific information. Package may or may not include the corporate logo.

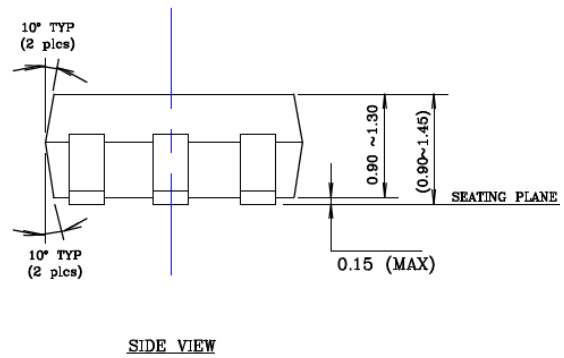
Underbar (_) and/or Overbar (‾) symbol may not be to scale.

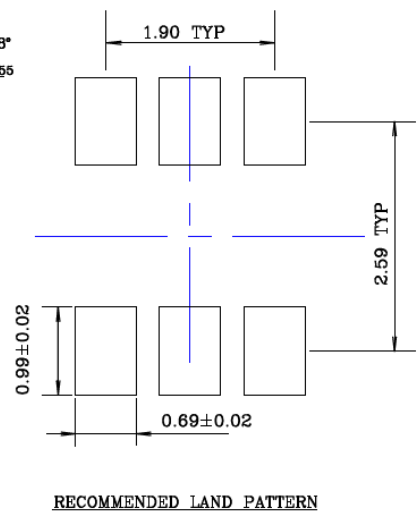
6-Lead SOT23 Package Outline & Recommended Land Pattern

TITLE
6 LEAD SOT23 PACKAGE OUTLINE & RECOMMENDED LAND PATTERN

DRAWING #	SOT23-6LD-PL-1	UNIT	MM







NOTE:
1. Dimensions and tolerances are as per ANSI Y14.5M, 1982.
2. Package surface to be mirror finish.
3. Die is facing up for mold. Die is facing down for trim/form, ie. reverse trim/form.
4. The footlength measuring is based on the gauge plane method.
5. (△) Dimension are exclusive of mold flash & gate burr.

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging.

APPENDIX A: REVISION HISTORY

Revision A (May 2022)

- Converted Micrel document MIC5211 to Microchip data sheet template DS20006684A.
- Minor grammatical text changes throughout.

NOTES:

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, contact your local Microchip representative or sales office.

Device	-X.X	X	XX	-XX
Part No.	Dual Output Voltage	Junction Temp. Range	Package	Media Type

Device	-XX	X	XX	-XX
Part No.	Mixed Output Voltage	Junction Temp. Range	Package	Media Type

Device:	MIC5211:		Dual µCap 80 mA LDO Regulator
Dual Output Voltage:	1.8	=	1.8V
	2.5	=	2.5V
	2.7	=	2.7V
	2.8	=	2.8V
	3.0	=	3.0V
	3.3	=	3.3V
	3.6	=	3.6V
	5.0	=	5.0V
Mixed Output Voltage:	BC	=	1.8V/2.5V
	BL	=	1.8V/3.3V
	CL	=	2.5V/3.3V
	LX	=	3.3V/5.0V
Junction Temperature Range:	Y	=	–40°C to +125°C, RoHS-Compliant
Package:	M6	=	6-Lead SOT23
Media Type:	TX	=	3,000/Reverse Tape & Reel (RVT/R)
	TR	=	3,000/Reel

Voltage Code Table

Voltage	Code
1.8V	B
2.5V	C
2.7V	D
2.8V	E
3V	G
3.15V	H
3.3V	L
3.6V	Q
5V	X

Note: Other voltage options available. Contact your Microchip sales office.

Examples:

a) MIC5211-1.8YM6-TR: MIC5211, 1.8V Dual Output Voltage, 0°C to +125°C (Note 2), Temperature Range, 6-Lead SOT23, 3,000/Reel

b) MIC5211-3.0YM6-TR: MIC5211, 3.0V Dual Output Voltage, –40°C to +125°C, Temperature Range, 6-Lead SOT23, 3,000/Reel

c) MIC5211-3.0YM6- TX: MIC5211, 3.0V Dual Output Voltage, –40°C to +125°C, Temperature Range, 6-Lead SOT23, 3,000 Reverse Tape & Reel

d) MIC5211-3.3YM6-TR: MIC5211, 3.3V Dual Output Voltage, –40°C to +125°C, Temperature Range, 6-Lead SOT23, 3,000/Reel

e) MIC5211-BCYM6-TR: MIC5211, 1.8V/2.5V Mixed Output Voltage, 0°C to +125°C (Note 2), Temperature Range, 6-Lead SOT23, 3,000/Reel

f) MIC5211-BLYM6-TR: MIC5211, 1.8V/3.3V Mixed Output Voltage, 0°C to +125°C (Note 2), Temperature Range, 6-Lead SOT23, 3,000/Reel

g) MIC5211-CLYM6-TR: MIC5211, 2.5V/3.3V Mixed Output Voltage, –40°C to +125°C, Temperature Range, 6-Lead SOT23, 3,000/Reel

h) MIC5211-LXYM6-TR: MIC5211, 3.3V/5.0V Mixed Output Voltage, –40°C to +125°C, Temperature Range, 6-Lead SOT23, 3,000/Reel

Note 1: Tape and Reel identifier only appears in the catalog part number description. This identifier is used for ordering purposes and is not printed on the device package. Check with your Microchip Sales Office for package availability with the Tape and Reel option.

2: For V_R = 1.8V, temperature range is 0°C to +125°C.

NOTES:

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