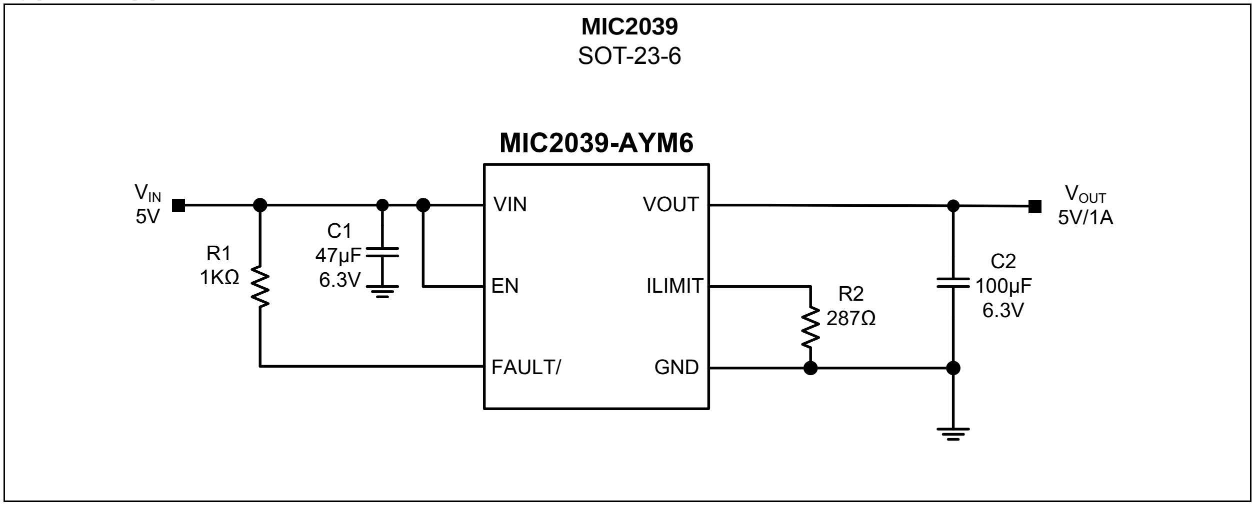
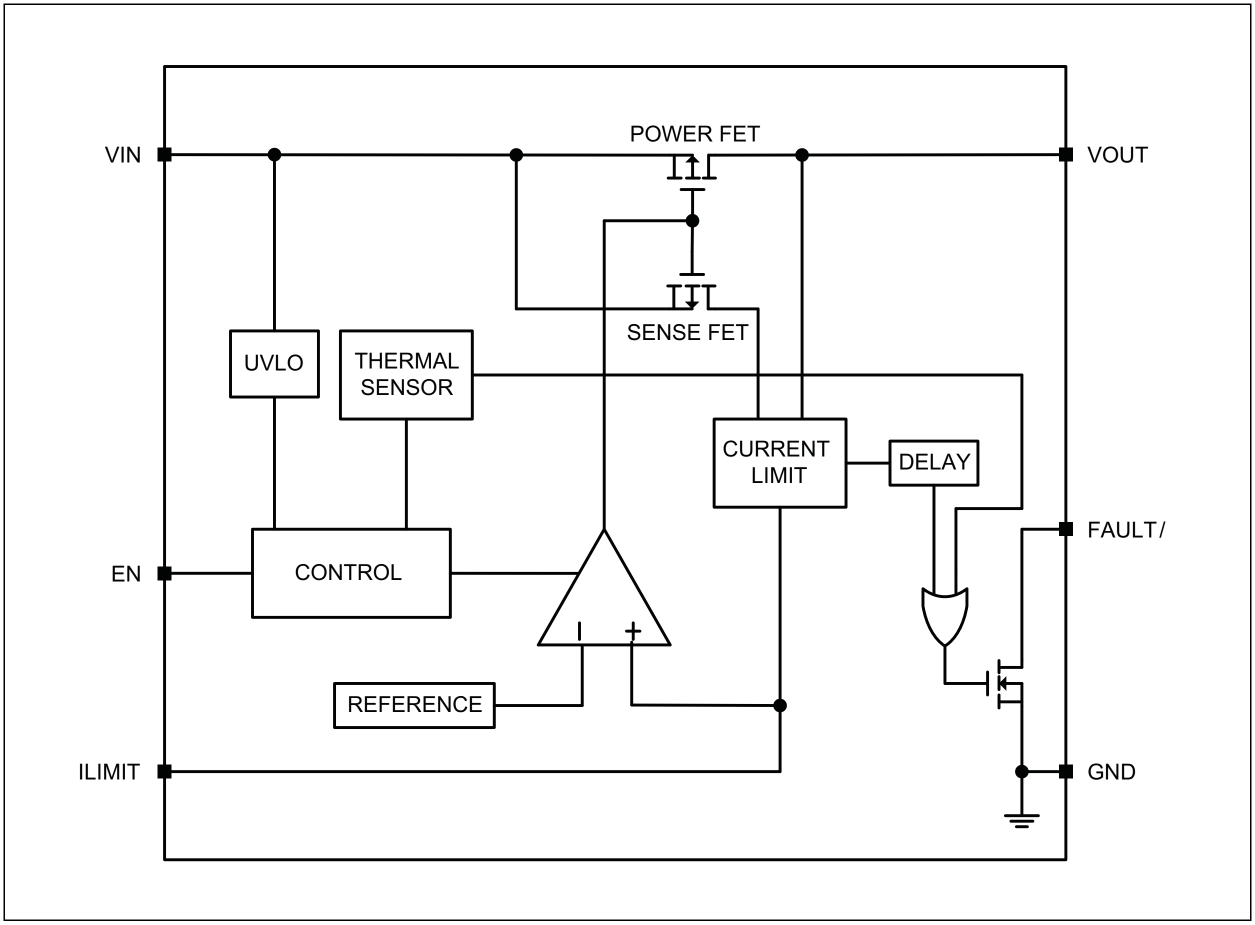
Typical Application Circuit



Functional Block Diagram



1.0 ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings †

V_{IN} to GND	–0.3V to +6V
V_{OUT} to GND	–0.3V to V_{IN}
V_{ILIMIT} to GND	–0.3V to V_{IN} + 0.3V
V_{EN} to GND	–0.3V to V_{IN}
$V_{FAULT/}$ to GND	–0.3V to V_{IN} + 0.3V
FAULT/ Current ($I_{FAULT/}$)	25 mA
Maximum Power Dissipation (P_D)	Internally Limited
ESD Rating (HBM) (Note 1)	3 kV
ESD Rating (MM) (Note 1)	300V

Operating Ratings ‡

Supply Voltage (V_{IN})	+2.5V to +5.5V
V_{EN}	–0.3V to V_{IN}
$V_{FAULT/}$	–0.3V to +5.5V
V_{ILIMIT}, V_{OUT}	–0.3V to V_{IN}

† **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. Human body model, 1.5 kΩ in series with 100 pF.

TABLE 1-1: ELECTRICAL CHARACTERISTICS

Electrical Characteristics: $V_{IN} = V_{EN} = 5V$, $C_{IN} = 1\ \mu F$; $T_J = +25°C$, unless noted. **Bold** values indicate $-40°C \le T_J \le +125°C$. (**Note 1**).

Symbol	Parameters	Min.	Typ.	Max.	Units	Conditions
Power Supply Input						
V_{IN}	Input Voltage Range	**2.5**	—	**5.5**	V	—
V_{UVLO}	Input Supply Undervoltage Lockout Threshold	**2.0**	2.25	**2.5**	V	V_{IN} rising
		1.9	2.15	**2.4**		V_{IN} falling
$V_{UVLOHYS}$	Input Supply Undervoltage Lockout Threshold Hysteresis	—	100	—	mV	V_{IN} rising or V_{IN} falling
I_{DD}	Supply Current	—	0.75	**5**	µA	Switch OFF; Active-High Enable (A): $V_{EN} = 0V$, $V_{IN} = 5V$, $I_{OUT} = 0A$
						Switch OFF; Active-Low Enable (B): $V_{EN} = 1.5V$, $V_{IN} = 5V$, $I_{OUT} = 0A$
		—	100	**300**	µA	Switch ON; Active-High Enable (A): $V_{EN} = 1.5V$, $V_{IN} = 5V$, $I_{OUT} = 0A$
						Switch ON; Active-Low Enable (B): $V_{EN} = 0V$, $V_{IN} = 5V$, $I_{OUT} = 0A$
Power MOSFET						
$R_{DS(ON)}$	Switch On-Resistance	—	100	**177**	mΩ	$V_{IN} = 2.5V$, $I_{OUT} = 350\ mA$
		—	85	**145**		$V_{IN} = 3.3V$, $I_{OUT} = 350\ mA$
		—	75	**125**		$V_{IN} = 5V$, $I_{OUT} = 350\ mA$
I_{LKG}	Output Leakage Current		0.22	**15**	µA	Switch OFF, $V_{OUT} = 0V$
Current Limit						
I_{LIMIT}	Current Limit (Resistor Values are Standard 0.1% Values)	2.35	2.5	2.65	A	$R_{LIMIT} = 115\Omega$, $V_{IN} = 5V$, $V_{OUT} = 0.8V \times V_{IN}$
						$R_{LIMIT} = 115\Omega$, $V_{IN} = 2.5V$, $V_{OUT} = 0V$
		1.90	2.0	2.10		$R_{LIMIT} = 145\Omega$, $V_{IN} = 5V$, $V_{OUT} = 0.8V \times V_{IN}$
		0.95	1.0	1.05		$R_{LIMIT} = 287\Omega$, $V_{IN} = 5V$, $V_{OUT} = 0.8V \times V_{IN}$
		0.475	0.50	0.525		$R_{LIMIT} = 576\Omega$, $V_{IN} = 5V$, $V_{OUT} = 0.8V \times V_{IN}$
		0.19	0.20	0.21		$R_{LIMIT} = 1.45\ k\Omega$, $V_{IN} = 5V$, $V_{OUT} = 0.8V \times V_{IN}$
I_{LIMIT_2ND}	Secondary Current Limit (Kickstart parts only)	2.2	3.2	6.0	A	$V_{OUT} = 0V$

Note 1: Specification for packaged product only.

2: See Timing Diagrams.

3: For dynamic current loads faster than typically 30 mA/ms. Slower current loads will delay the deactivation of VOUT and the current limitation, allowing FAULT/ to be asserted before these.

TABLE 1-1: ELECTRICAL CHARACTERISTICS (CONTINUED)

Electrical Characteristics: V_{IN} = V_{EN} = 5V, C_{IN} = 1 µF; T_J = +25°C, unless noted. **Bold** values indicate –40°C ≤ T_J ≤ +125°C. **(Note 1)**.

Symbol	Parameters	Min.	Typ.	Max.	Units	Conditions
I/O						
V_{EN}	Enable Voltage	—	—	**0.5**	V	Logic-Low
		1.5	—	—		Logic-High
I_{EN}	Enable Input Current	—	1	—	µA	0V ≤ V_{EN} ≤ 5V
$R_{FAULT/}$	FAULT/ Output Resistance	—	—	**25**	Ω	I_{OUT} = 10 mA
$I_{FAULT/\_OFF}$	FAULT/ Off Current	—	—	10	µA	$V_{FAULT/}$ = V_{IN}
Thermal Protection						
T_{SD}	Thermal Shutdown Threshold	—	157	—	°C	T_J rising
T_{SDHYS}	Thermal Shutdown Hysteresis	—	15	—	°C	—
Timing Specifications (AC Parameters)						
t_{RISE}	Output Turn-On Rise Time (Note 2)	—	700	—	µs	R_{LOAD} = 10Ω; C_{OUT} = 1 µF
t_{FALL}	Output Turn-Off Fall Time (Note 2)	—	32	—	µs	V_{EN} = OFF; R_{LOAD} = 10Ω; C_{OUT} = 1 µF
t_{ON_DLY}	Output Turn-On Delay (Note 2)	—	700	—	µs	R_{LOAD} = 10Ω; C_{OUT} = 1 µF
t_{OFF_DLY}	Output Turn-Off Delay (Note 2)	—	5	—	µs	R_{LOAD} = 10Ω; C_{OUT} = 1 µF
t_{SC_RESP}	Short Circuit Response Time (Note 2, Note 3)	—	10	—	µs	V_{OUT} = 0V (short-circuit)
$t_{FAULT/}$	Overcurrent Fault Response Delay Time (Note 2, Note 3)	**16**	32	**49**	ms	Non-kickstart parts.
$t_{KICKSTART}$	Overcurrent Fault Response Delay During Kickstart (Note 2)	**64**	120	**200**	ms	Kickstart parts only.

Note 1: Specification for packaged product only.

2: See Timing Diagrams.

3: For dynamic current loads faster than typically 30 mA/ms. Slower current loads will delay the deactivation of VOUT and the current limitation, allowing FAULT/ to be asserted before these.

TEMPERATURE SPECIFICATIONS

Parameters	Sym.	Min.	Typ.	Max.	Units	Conditions
Temperature Ranges						
Junction Operating Temperature Range	T_J	–40	—	+125	°C	Note 1
Storage Temperature Range	T_S	–65	—	+150	°C	—
Lead Temperature	—	—	—	+260	°C	Soldering, 10s
Package Thermal Resistances						
Thermal Resistance SOT-23-6	θ_{JA}	—	177.2	—	°C/W	—
Thermal Resistance 6-pin 2 mm x 2 mm Thin DFN	θ_{JA}	—	90	—	°C/W	—

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.

2.0 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.

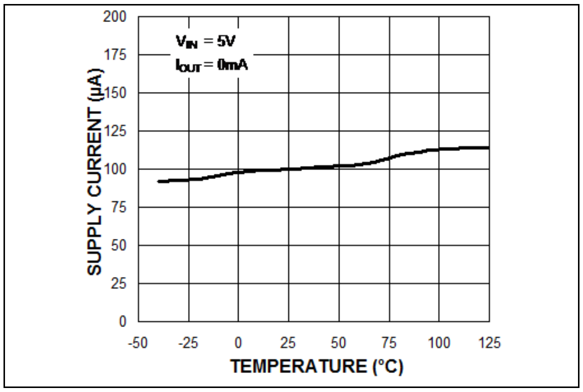


FIGURE 2-1: Input Supply Current vs. Temperature.

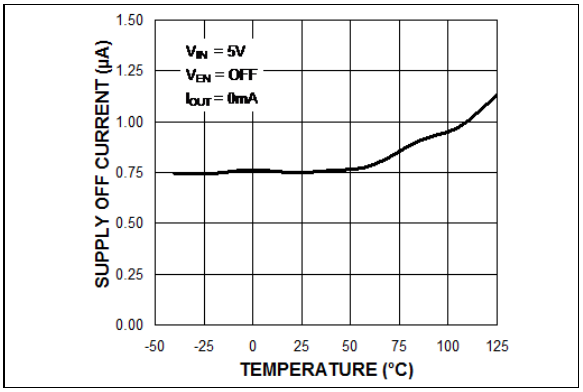


FIGURE 2-2: V_{IN} OFF Current vs. Temperature.

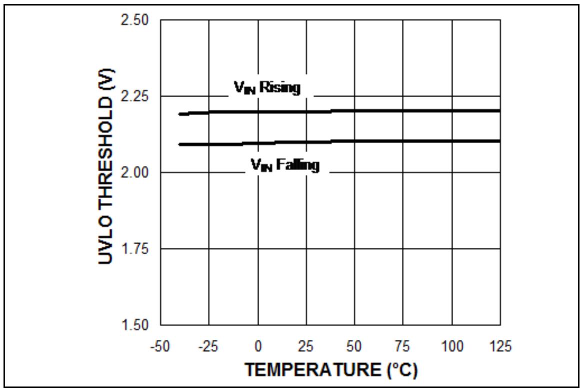


FIGURE 2-3: Undervoltage Lockout vs. Temperature.

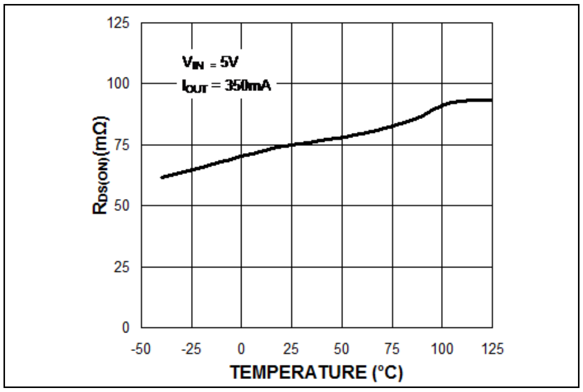


FIGURE 2-4: $R_{DS(ON)}$ vs. Temperature.

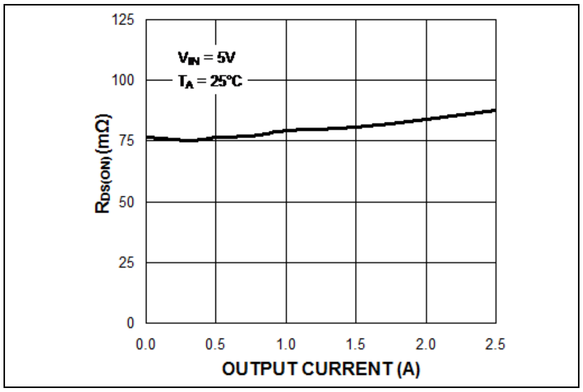


FIGURE 2-5: $R_{DS(ON)}$ vs. Temperature.

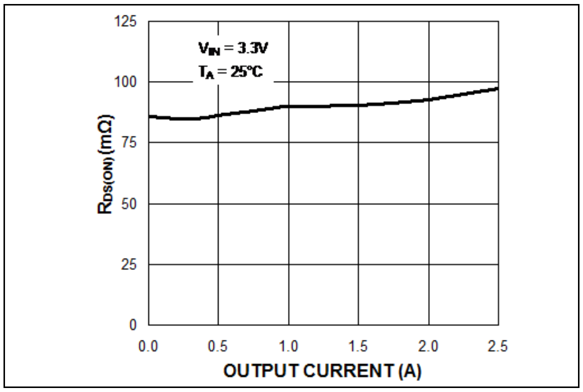


FIGURE 2-6: $R_{DS(ON)}$ vs. Output Current.

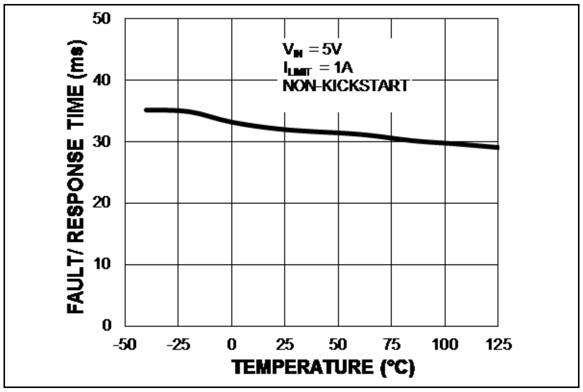


FIGURE 2-7: *FAULT/ Response Time vs. Temperature.*

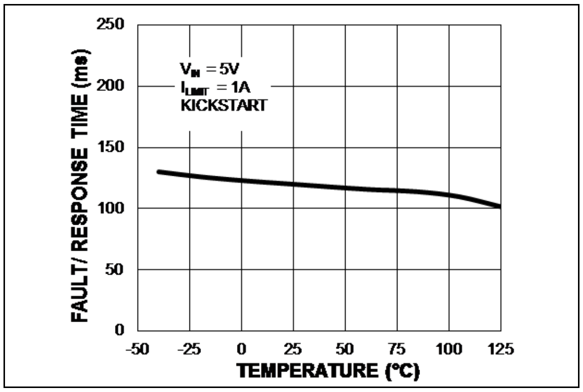


FIGURE 2-8: *FAULT/ Response Time vs. Temperature.*

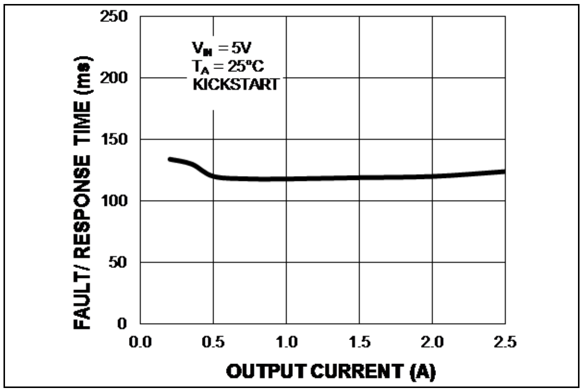


FIGURE 2-9: *FAULT/ Response Time vs. Output Current.*

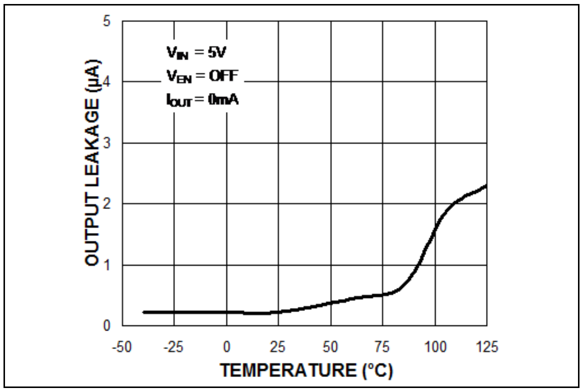


FIGURE 2-10: *Output Leakage Current vs. Temperature.*

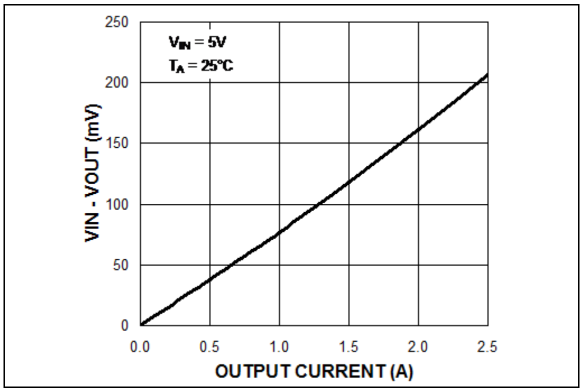


FIGURE 2-11: *V_{IN} - V_{OUT} vs. Output Current.*

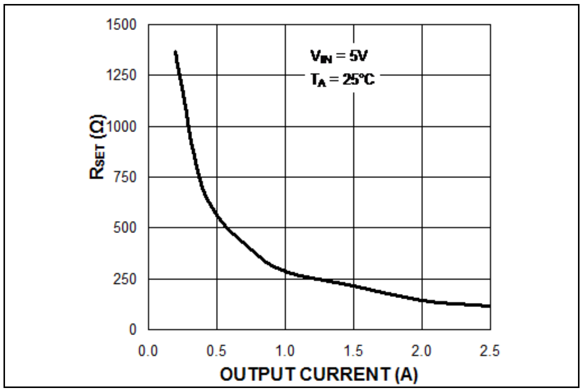


FIGURE 2-12: *Current Limit Set Resistor vs. Output Current.*

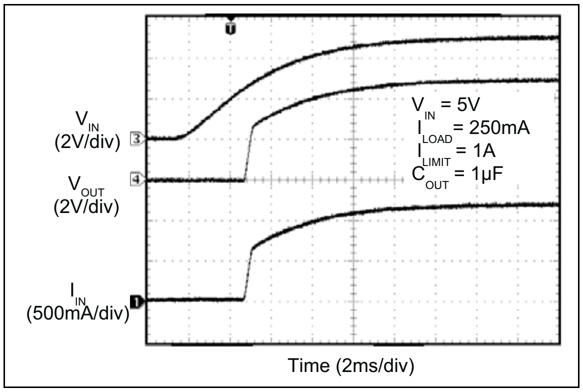


FIGURE 2-13: *Soft-Start Turn-On.*

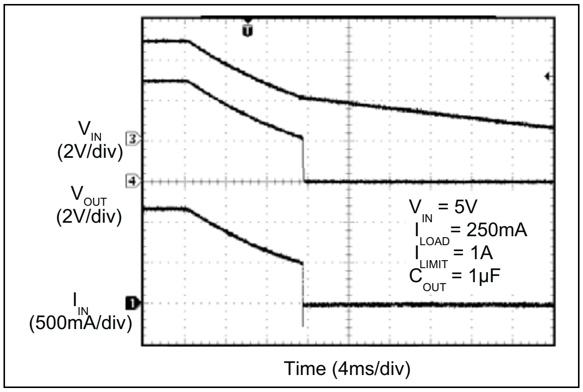


FIGURE 2-14: *Soft-Start Turn-Off.*

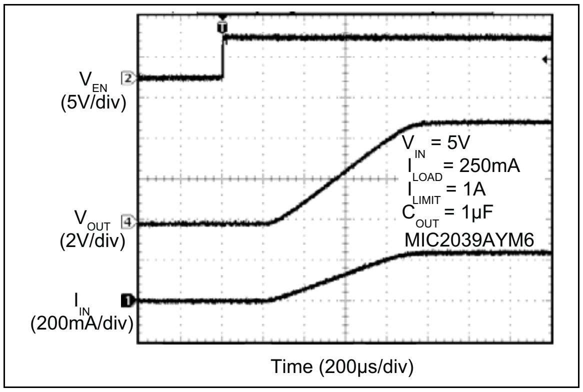


FIGURE 2-15: *Enable Turn-On.*

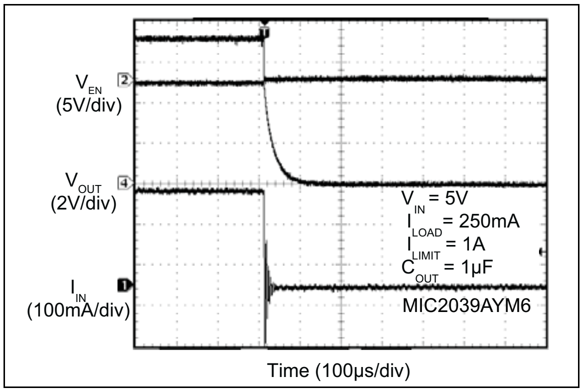


FIGURE 2-16: *Enable Turn-Off.*

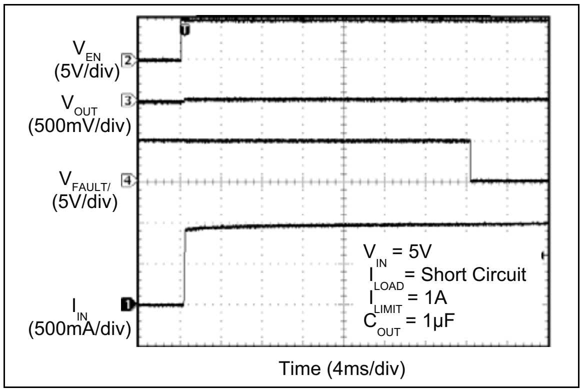


FIGURE 2-17: *Turn-On Into Short-Circuit.*

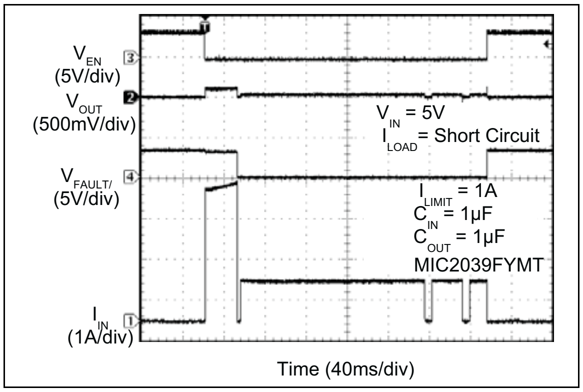


FIGURE 2-18: *Turn-On Into Short (Kickstart).*

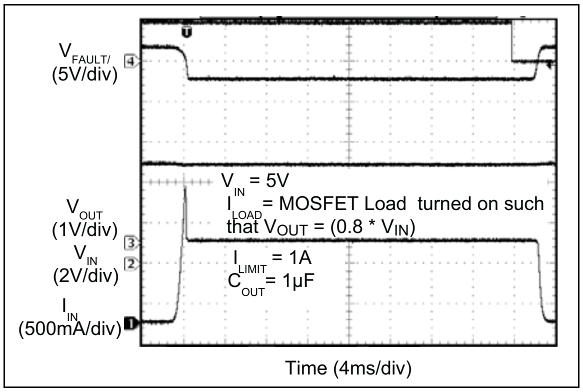


FIGURE 2-19: *Current-Limit Response.*

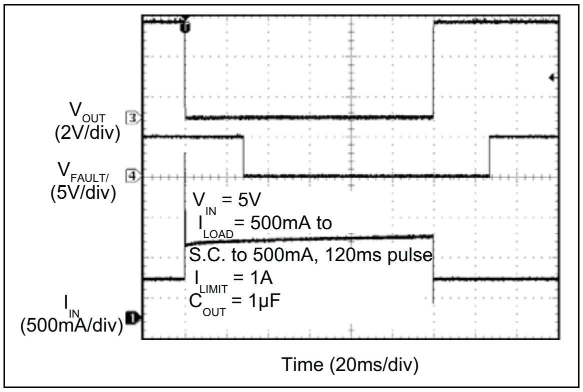


FIGURE 2-20: *Output Recovery from Short-Circuit.*

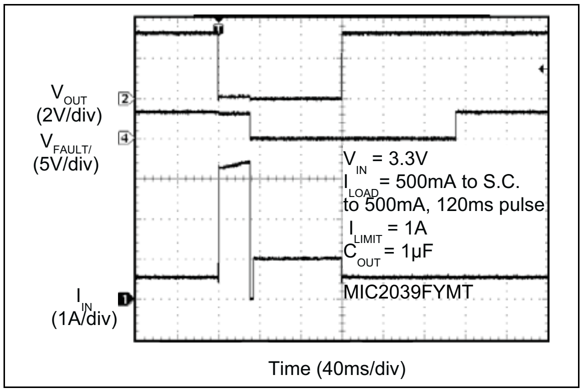


FIGURE 2-21: *Output Recovery from Short-Circuit (Kickstart).*

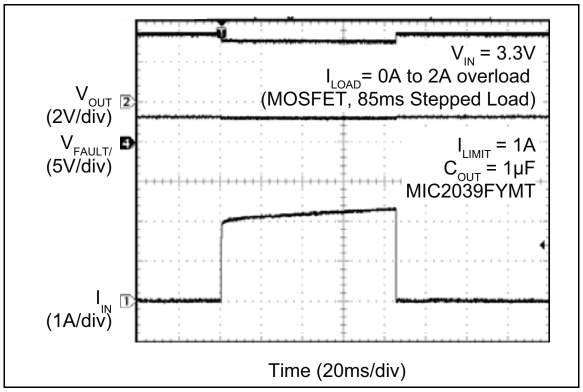


FIGURE 2-22: *85 ms Stepped Load Pulse (Kickstart).*

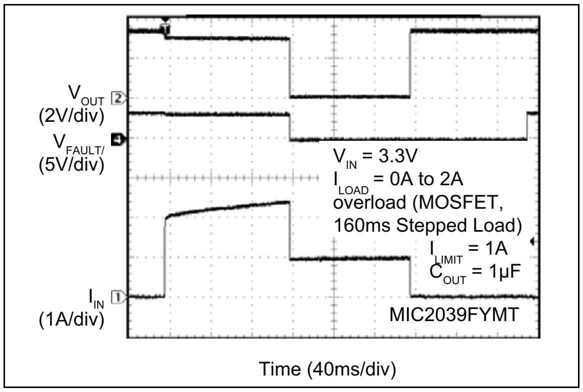


FIGURE 2-23: *160 ms Stepped Load Pulse (Kickstart).*

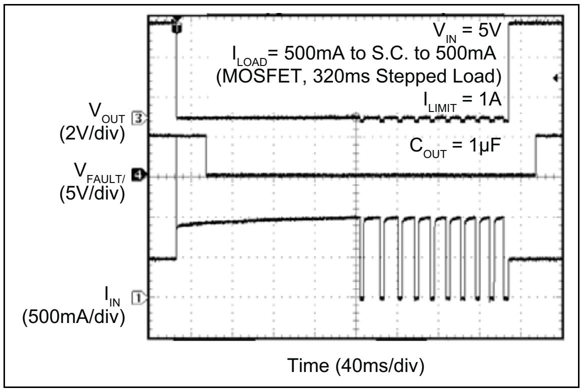


FIGURE 2-24: *Output Thermal Shutdown and Recovery.*

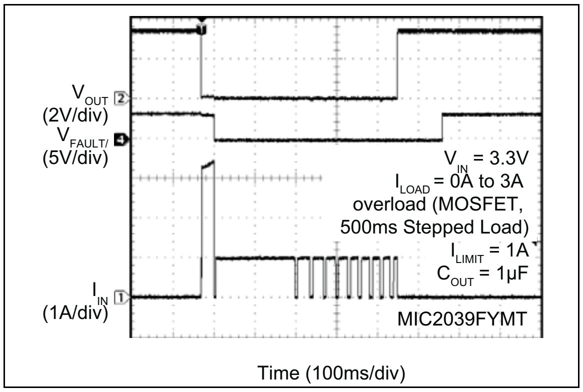


FIGURE 2-25: *Output Thermal Shutdown and Recovery (Kickstart).*

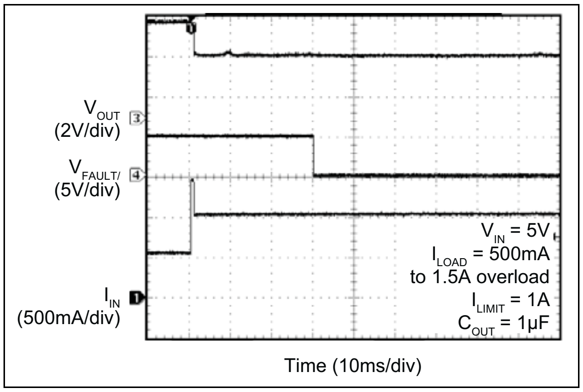


FIGURE 2-26: *1.5A Overload Response.*

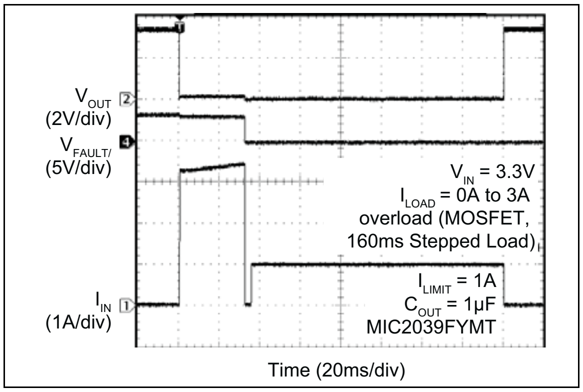


FIGURE 2-27: *3A Overload Response (Kickstart).*

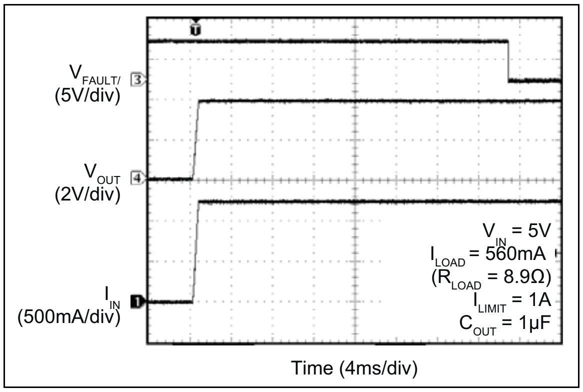


FIGURE 2-28: *Turn-On into 12% Overload - 500 mA I_{LIMIT}.*

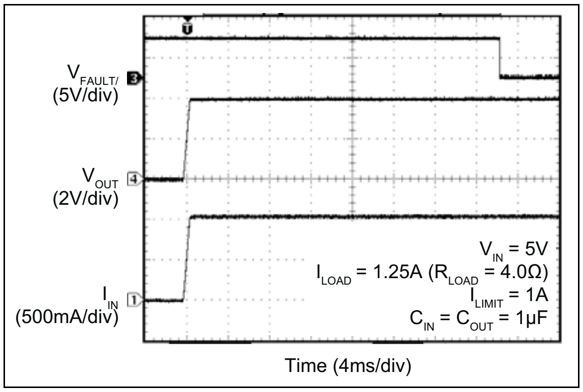


FIGURE 2-29: *Turn-On into 25% Overload - 1A I_{LIMIT}.*

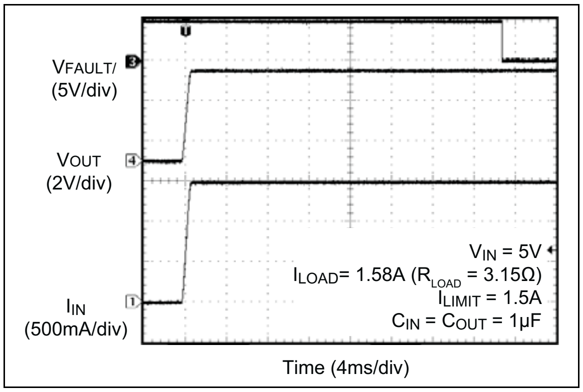


FIGURE 2-30: *Turn-On into Minimal Overload - 1.5A I_{LIMIT}.*

3.0 PIN DESCRIPTIONS

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

TABLE 3-1: PIN FUNCTION TABLE

Pin Number SOT-23-6L	Pin Number Thin DFN	Pin Name	Description
1	6	V_{IN}	Input: Power switch and logic supply input.
2	5	GND	Ground: Input and output return pin.
3	4	EN	Enable (Input): Logic compatible, enable control input that allows turn-on/off of the switch. Do not leave the EN pin floating.
4	3	FAULT/	Fault Status Flag (Output): Active-low, open-drain output. A logic-low state indicates an overcurrent or thermal shutdown condition. An overcurrent condition must last longer than $t_{FAULT/}$ in order to assert FAULT/. A pull-up resistor (10 kΩ recommended) to an external supply is required.
5	2	I_{LIMIT}	Current Limit Set: Current limit adjust setting. Connect a resistor from this pin to GND to set the current limit, but do not leave the I_{LIMIT} pin floating.
6	1	V_{OUT}	Switch Output: Power switch output.
—	EP	ePad	Exposed Pad: Exposed pad on bottom side of package. Connect to electrical ground for optimum thermal dissipation.

4.0 FUNCTIONAL DESCRIPTION

The MIC2039 is a high-side MOSFET power distribution switch that provides increased system reliability by using 5% current-limit accuracy. The MIC2039 is internally current-limited and has thermal shutdown, which protects the device and system.

The MIC2039 has a soft-start circuit that minimizes inrush current by slowing the turn-on time. Additionally, the MIC2039 has an optional kickstart feature, which momentarily overrides the normal current-limiting function to allow higher inrush and/or transient currents.

4.1 Soft-Start

Soft-start reduces the power supply input surge current at startup by controlling the output voltage rise time. The input surge appears while the output capacitor is charged up. A slower output rise time draws a lower input surge current.

4.2 Kickstart Inrush Overcurrent Filter

The MIC2039EYxx and MIC2039FYxx are equipped with a secondary current-limit that allows high inrush current transients to pass for a set period before the primary current-limit circuitry becomes active. The FAULT/ status flag does not assert during the kickstart period (typically 120 ms), which eliminates any false (FAULT/) assertions. The kickstart function is active during initial startup or while operating in steady state.

4.3 Input Capacitor

A 1 µF to 100 µF ceramic input capacitor is recommended for most applications. Place the input capacitor on the same side of the board and next to the MIC2039 to minimize the voltage ringing during transient and short-circuit conditions. Using two vias for each end of the capacitor to connect to the power and ground plane is also recommended.

An X7R or X5R dielectric ceramic capacitors is recommended because of their temperature performance. X7R-type capacitors change capacitance by 15% over their operating temperature range and are the most stable type of ceramic capacitors. Z5U and Y5V dielectric capacitors change value by as much as 50% and 60%, respectively, over their operating temperature ranges. To use a ceramic chip capacitor with Y5V dielectric, the value must be much higher than an X7R ceramic or a tantalum capacitor to ensure the same capacitance value over the operating temperature range.

4.4 Output Capacitor

The output capacitor type and placement criteria are the same as the input capacitor.

The exact amount of capacitance depends upon the specific application. For example, USB applications will typically use 150 µF, whereas local consumers, such as microcontrollers, may require as little as 1 µF.

Care must be taken when choosing the output capacitance for inductive loads. Without sufficient capacitance or clamping devices, sudden disconnects or shorts on VOUT can result in stresses beyond the device's absolute maximum ratings, even for short cables, which will damage the device.

4.5 Enable

The MIC2039 offers either an active-high or active-low enable input (EN) that allows ON/OFF control of the switch output. The current through the device reduces to near zero when the device is shut down, with only microamperes of leakage current. The EN input can be directly tied to V_{IN} or driven by a voltage that is equal to or less than V_{IN}. Do not leave this pin floating.

Care should be taken to ensure that the EN pin does not exceed V_{IN} by more than 500 mV at any time. This includes at power-up and during load transients. Whenever possible, it is recommended to tie EN to V_{IN} through a pull-up resistor and use an open-drain or open-collector device to change the state.

4.6 Adjustable Current-Limit

The MIC2039 current-limit is adjustable from 0.2A to 2.5A by connecting a resistor from the I_{LIMIT} pin to GND. The following equation determines the resistor:

EQUATION 4-1:

$$R_{LIMIT} \cong \frac{289}{I_{LIMIT}}$$

Where:

I_{LIMIT}	Typical current-limit from Electrical Characteristics table.

If the output current exceeds the set current-limit, the MIC2039 switch enters constant current-limit mode. The maximum allowable current-limit can be less than the full specified and/or expected current if the MIC2039 is not mounted on a circuit board with sufficiently low thermal resistance. Table 4-1 shows resistor values (1%) for select current-limit settings.

TABLE 4-1: RESISTOR SELECTION FOR ADJUSTABLE CURRENT-LIMIT

I_{LIMIT}	0.2A	0.5A	1.0A	2.0A	2.5A
R_{LIMIT}	1.45 kΩ	576Ω	287Ω	145Ω	115Ω

4.7 Thermal Design

To help reduce the thermal resistance, the ePad (underneath the IC) should be soldered to the PCB ground. The placement of thermal vias either underneath or near the ePad is highly recommended. Thermal design requires the following application-specific parameters:

- Maximum ambient temperature (T_A)
- Output current (I_{OUT})
- Input voltage (V_{IN})
- Current Limit (I_{LIMIT})

When the MIC2039 is in constant current-limit mode, it may exceed the overtemperature threshold. If this occurs, the overtemperature condition will shut down the MIC2039 switch and the fault status flag will go active (assert low). After the switch cools down, it will turn on again. The user can maximize the MIC2039 power dissipation by either lowering the thermal resistance on the exposed pad (only the DFN package has an exposed pad) on the printed circuit board, or by limiting the maximum allowable ambient temperature.

4.8 Thermal Measurements

It is always wise to measure the IC's case temperature to make sure that it is within its operating limits. Although this might seem like an elementary task, it is very easy to get false results. The most common mistake is to use the standard thermal couple that comes with the thermal voltage meter. This thermal couple wire gauge is large, typically 22 gauge, and behaves like a heatsink, resulting in a lower case measurement.

There are two suggested methods for measuring the IC case temperature: a thermal couple or an infrared thermometer. If a thermal couple is used, it must be constructed of 36 gauge wire or higher to minimize the wire heatsinking effect. In addition, the thermal couple tip must be covered in either thermal grease or thermal glue to make sure that the thermal couple junction is making good contact to the case of the IC. Thermal couple 5SC TT-K-36-36 from Omega is adequate for most applications.

To avoid using messy thermal couple grease or glue, an infrared thermometer is recommended. Most infrared thermometers' spot size is too large for an accurate reading on small form factor ICs. However, an IR thermometer from Optris has a 1 mm spot size, which makes it ideal for the 2 mm x 2 mm thin DFN package. Also, get the optional stand. The stand makes it easy to hold the beam on the IC for long periods of time.

5.0 TIMING DIAGRAMS

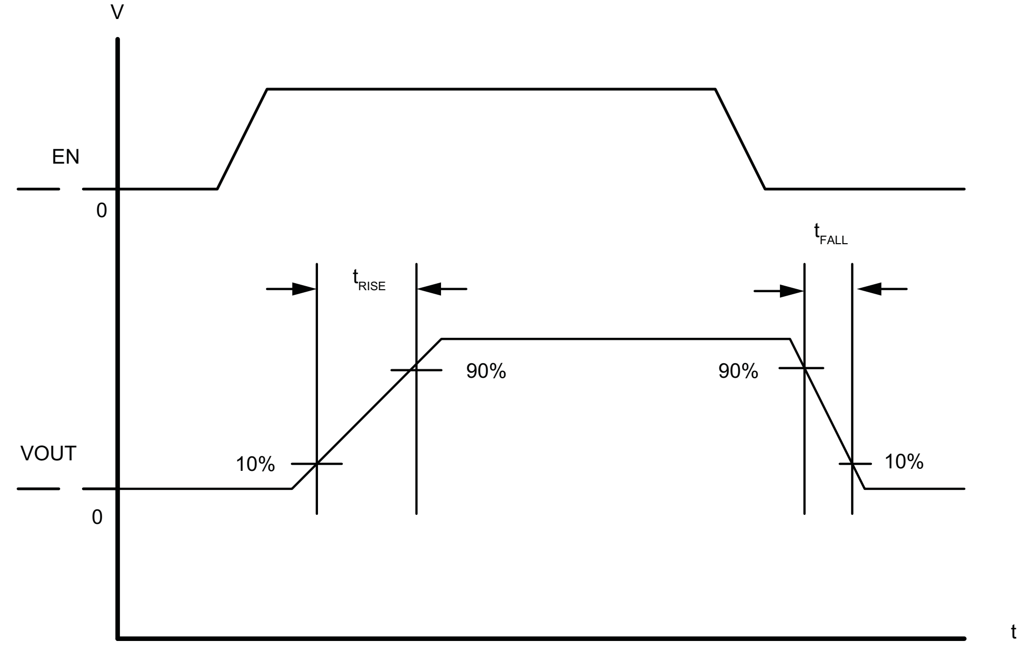


FIGURE 5-1: *Output Rise/Fall Time.*

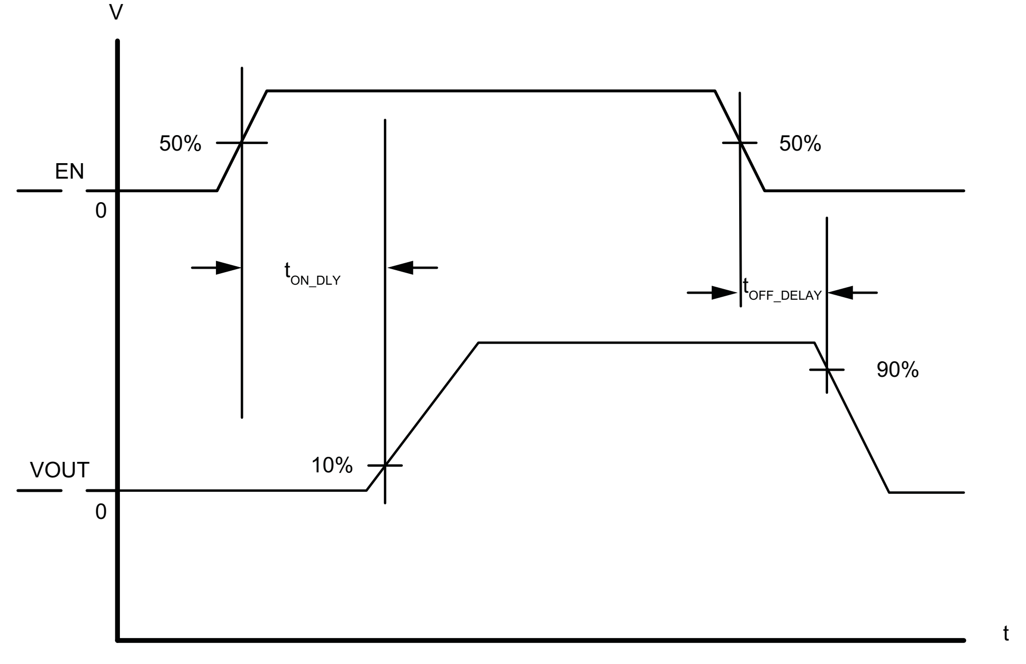


FIGURE 5-2: *Turn-On/Off Delay.*

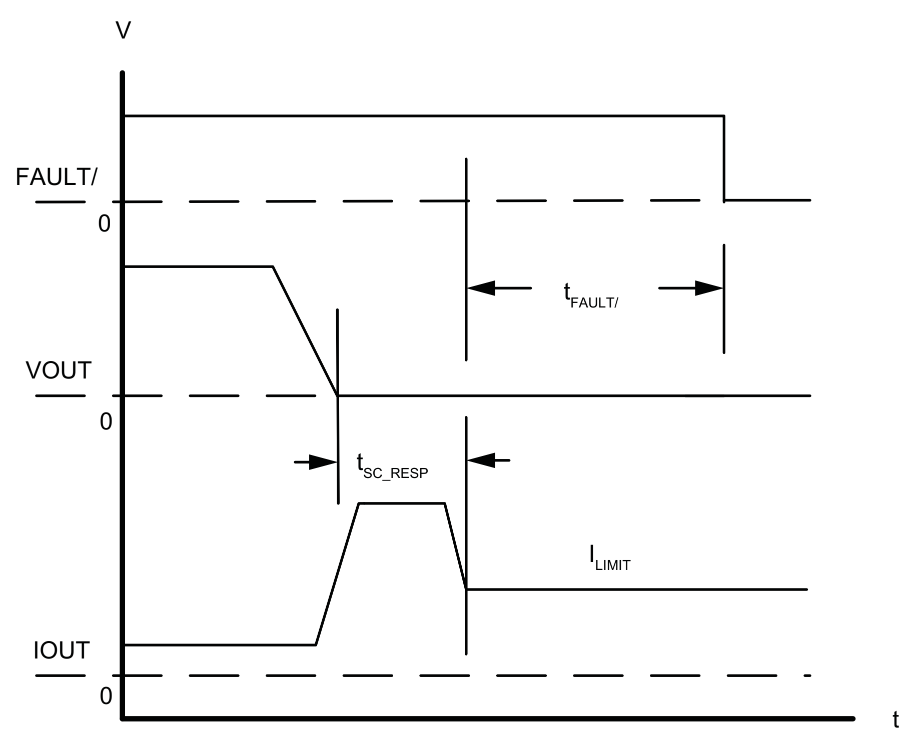


FIGURE 5-3: *Short-Circuit Response Time and Overcurrent Fault Flag Delay (Non-Kickstart).*

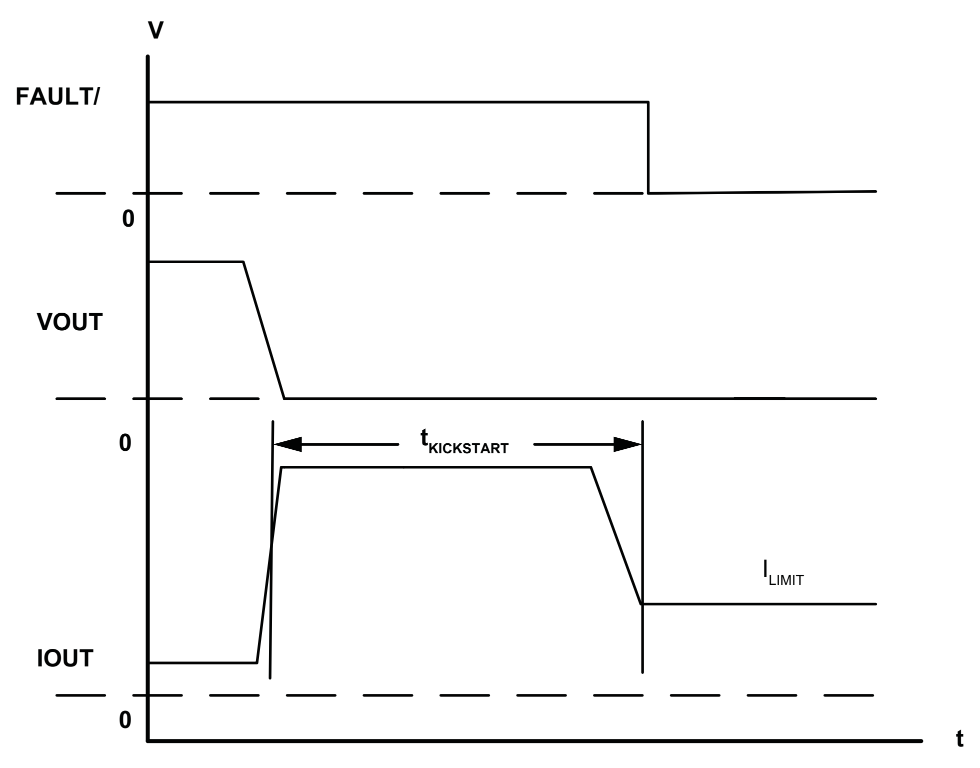
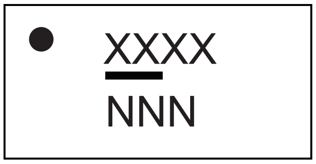


FIGURE 5-4: *Overcurrent Fault Flag Delay (Kickstart).*

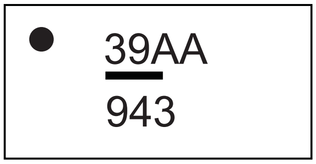
6.0 PACKAGING INFORMATION

6.1 Package Marking Information

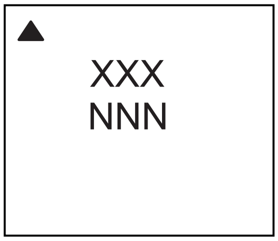
6-Pin SOT-23*



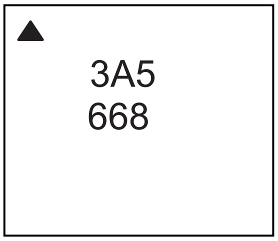
Example



6-Pin TDFN*



Example



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.

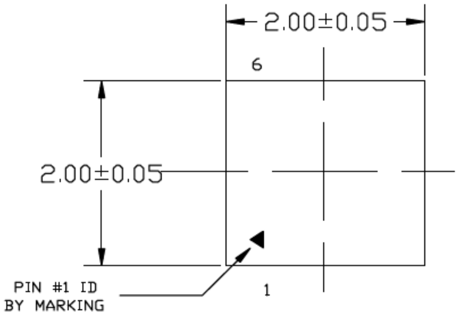
6-Lead TDFN 2 mm x 2 mm Package Outline and Recommended Land Pattern

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

TITLE

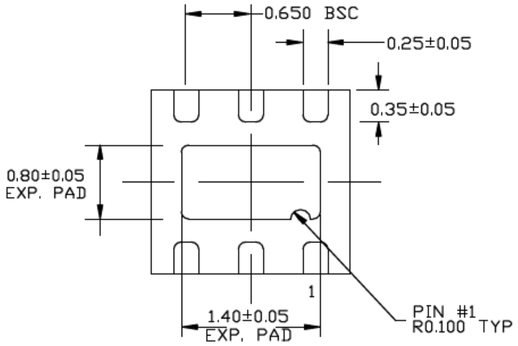
6 LEAD TDFN 2x2mm PACKAGE OUTLINE & RECOMMENDED LAND PATTERN (0.65mm lead pitch)

DRAWING #	TDFN22-6LD-PL-1	**UNIT**	MM



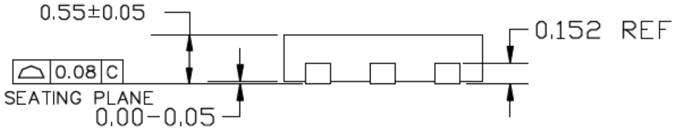
TOP VIEW

NOTE: 1, 2, 3



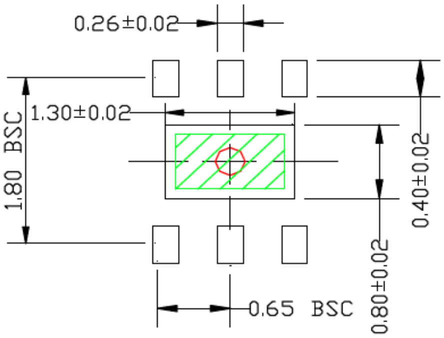
BOTTOM VIEW

NOTE: 1, 2, 3



END VIEW

NOTE: 1, 2, 3



RECOMMENDED LAND PATTERN

NOTE: 4, 5

NOTE:

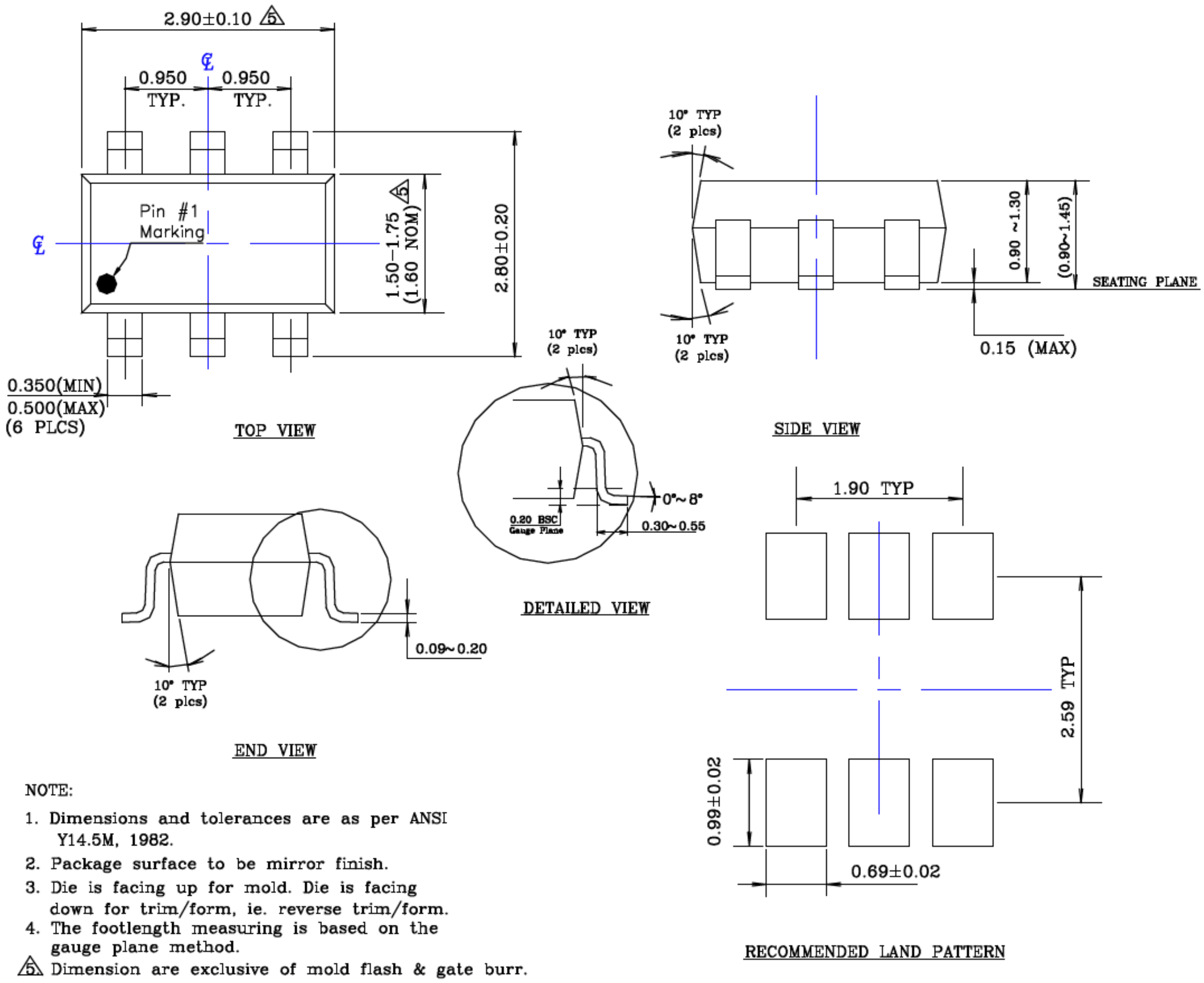
1. MAX PACKAGE WARPAGE IS 0.08 MM
2. MAX ALLOWABLE BURR IS 0.076MM IN ALL DIRECTIONS
3. PIN #1 IS ON TOP WILL BE LASER MARKED
4. RED CIRCLE IN LAND PATTERN REPRESENTS THERMAL VIA. SIZE SHOULD BE 0.30-0.3 MM IN DIAMETER AND SHOULD BE CONNECTED TO GND FOR MAX THERMAL PERFORMANCE
5. GREEN RECTANGLES (SHADED AREA) REPRESENTS SOLDER STENCIL OPENING ON EXPOSED PAD AREA. SIZE SHOULD BE 1.10x0.60 MM.

6-Lead SOT-23 Package Outline and Recommended Land Pattern

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

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.

NOTES:

APPENDIX A: REVISION HISTORY

Revision A (March 2018)

- Converted Micrel document MIC2039 to Microchip data sheet DS20005540A.
- Minor text changes throughout.
- Value for C1 corrected in Typical Application Circuit.

NOTES:

PRODUCT IDENTIFICATION SYSTEM

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

PART NO.	X	X	XX	–XX
Device	Enable	Temperature	Package	Media Type

Device: MIC2039: High-Accuracy, High-Side, Adjustable Current-Limit Power Switch

Enable:
A = Active-High
B = Active-Low
E = Active-High with Kickstart
F = Active-Low with Kickstart

Temperature: Y = –40°C to +125°C

Package:
M6 = SOT-23-6L
MT = 6-Lead 2 mm x 2 mm TDFN (Note 1)

Media Type:
T5 = 500/Reel
TR = 3,000/Reel

Note 1: Thin DFN is a GREEN RoHS-compliant package. Lead finish is NiPdAu. Mold compound is Halogen Free.

Examples:

a)	MIC2039AYM6-T5:	High-Accuracy, High-Side, Adjustable Current-Limit Power Switch, Active-High Enable, –40°C to +125°C Temp. Range, SOT-23-6L Package, 500/Reel
b)	MIC2039BYM6-TR:	High-Accuracy, High-Side, Adjustable Current-Limit Power Switch, Active-Low Enable, –40°C to +125°C Temp. Range, SOT-23-6L Package, 3,000/Reel
c)	MIC2039AYMT-TR:	High-Accuracy, High-Side, Adjustable Current-Limit Power Switch, Active-High Enable, –40°C to +125°C Temp. Range, 6-Lead TDFN Package, 3,000/Reel
d)	MIC2039BYMT-T5:	High-Accuracy, High-Side, Adjustable Current-Limit Power Switch, Active-Low Enable, –40°C to +125°C Temp. Range, 6-Lead TDFN Package, 500/Reel
e)	MIC2039EYM6-T5:	High-Accuracy, High-Side, Adjustable Current-Limit Power Switch, Active-High Enable with Kickstart, –40°C to +125°C Temp. Range, SOT-23-6L Package, 500/Reel
f)	MIC2039FYM6-TR:	High-Accuracy, High-Side, Adjustable Current-Limit Power Switch, Active-Low Enable with Kickstart, –40°C to +125°C Temp. Range, SOT-23-6L Package, 3,000/Reel
g)	MIC2039EYMT-TR:	High-Accuracy, High-Side, Adjustable Current-Limit Power Switch, Active-High Enable with Kickstart, –40°C to +125°C Temp. Range, 6-Lead TDFN Package, 3,000/Reel
h)	MIC2039FYMT-T5:	High-Accuracy, High-Side, Adjustable Current-Limit Power Switch, Active-Low Enable with Kickstart, –40°C to +125°C Temp. Range, 6-Lead TDFN Package, 500/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.

NOTES:

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- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

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