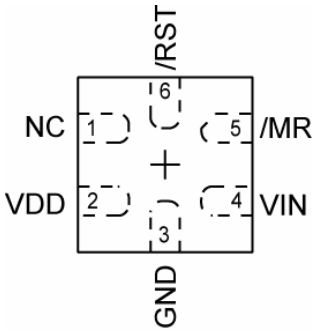
Ordering Information[1]

Part Number	Typical Application Voltage	Nominal Threshold Voltage	Package
MIC2785-16YFT	1.8V +10%	1.62V	6-Pin (1.2mm x 1.2mm) Thin MLF®

Note:

1. Other voltage thresholds available. Contact Micrel for details.

Pin Configuration



6-Pin (1.2mm x 1.2mm) Thin MLF® (FL)

Pin Description

Pin Number	Pin Name	Pin Function
1	NC	Not Internally Connected.
2	VDD	Analog (Input): Independent supply input for internal circuitry.
3	GND	Ground.
4	VIN	Analog (Input). Monitored input voltage. An under-voltage condition will trigger a reset sequence.
5	/MR	Digital (Input): Asserting this pin low initiates an immediate and unconditional reset. Assuming VIN is above the threshold when /MR is released (returns high), the reset output will be de-asserted. /MR may be driven by a logic signal or a mechanical switch. /MR has an internal pull-up to VDD and may be left floating if unused.
6	/RST	Digital (Output): Asserted low whenever the VIN pin voltage falls below the reference voltage or Manual Reset pin (/MR) is asserted. It will remain asserted until VIN voltage rises above the threshold voltage and the /MR pin is released. The maximum output voltage of the /RST pin is VIN. /RST is a push-pull output.

Absolute Maximum Ratings[1]

Supply Voltage (V_{DD}) ..... -0.3V to +6V
Monitor Input (V_{IN}) ..... -0.3V to +6V
Input Voltage ($V_{/MR}$) ..... -0.3V to +6V
/RST Current ..... ±20mA
Lead Temperature (soldering, 20sec.) ..... 260°C
Junction Temperature (T_J) ..... -40°C to +125°C
Storage Temperature (T_S) ..... -65°C to +150°C
ESD Rating[3] (Human Body Model) ..... ±1.5kV

Operating Ratings[2]

Supply Voltage (V_{DD}) ..... +1.5V to +5.5V
Monitor Input (V_{IN}) ..... –0.3V to + V_{DD}
Input Voltage ($V_{/MR}$) ..... –0.3V to + 5.5V
Ambient Temperature (T_A) ..... –40°C to +85°C
Junction Thermal Resistance
MLF® (θ_{JA}) ..... 140.7°C/W

Electrical Characteristics[4]

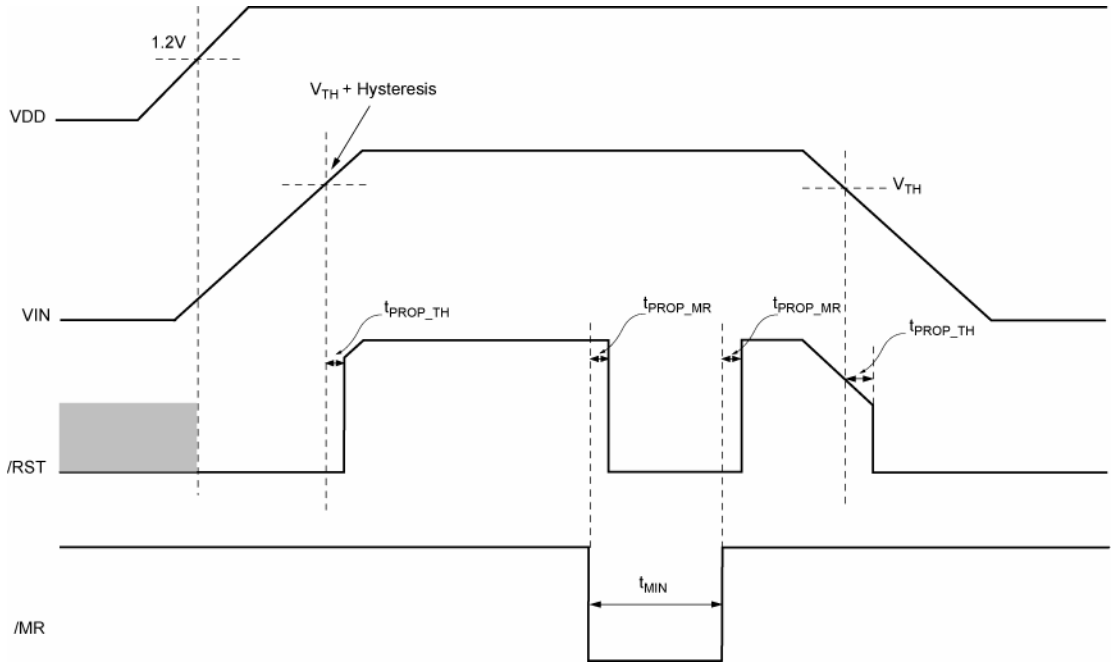
V_{DD} = 3.1V; V_{IN} = V_{DD} = 3.1V T_A = 25°C, bold values indicate –40°C≤ T_A ≤ +85°C, unless noted.

Symbol	Parameter	Condition	Min	Typ	Max	Units
I_{DD}	Supply Current (V_{DD})	V_{IN} = V_{TH} +1.6%, /MR & /RST open		1.0		µA
I_{IN}	Supply Current (V_{IN})	V_{IN} = V_{TH} +1.6%, /MR & /RST open		3.5		µA
	V_{TH} Accuracy		-1.5		+1.5	%
V_{HYST}	Hysteresis Voltage			1.5		%
t_{PROP_TH}	Propagation Delay	V_{IN} = V_{TH} ±1 .5%, ±100mV		5	25	µs
V_{OL}	Output Voltage Low	V_{IN} ≤ V_{TH} -1.5%, I_{SINK} = 100µA, V_{DD} > 1.2V			0.3	V
V_{OH}	Output Voltage High	V_{IN} > V_{TH} +1.5%, I_{SOURCE} = 500µA	0.8 * V_{IN}			V
/MR Input						
V_{IH}	Input High Voltage	V_{DD} = 3.1V	**1.7**			V
V_{IL}	Input Low Voltage	V_{DD} = 3.1V			**0.4**	V
t_{PROP_MR}	Propagation Delay	$V_{/MR}$ < (V_{IL} –100mV)		0.5	**25**	µs
t_{MIN}	Minimum Input Pulse Width	$V_{/MR}$ < V_{IL} reset occurs		33		ns
I_{PU}	Internal Pull-up Current			100		nA

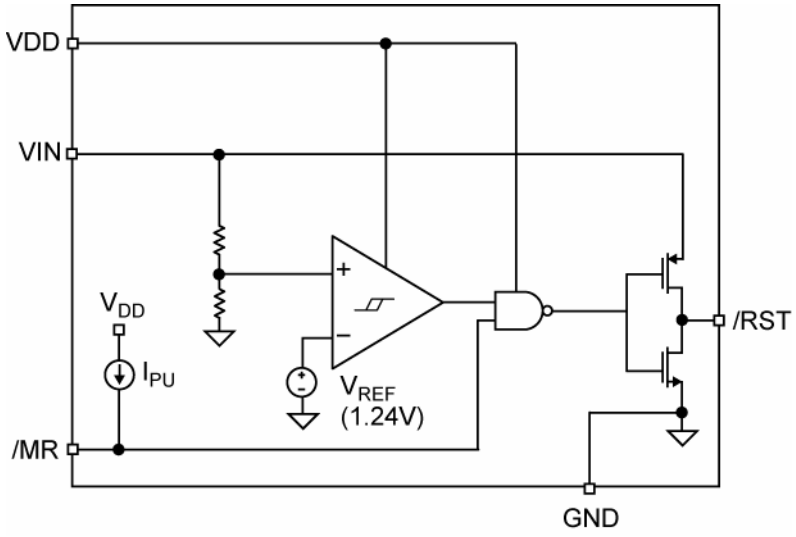
Notes:

1. Exceeding the absolute maximum rating may damage the device.
2. The device is not guaranteed to function outside its operating rating.
3. Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.
4. Specification for packaged product only.

Timing Diagram



Functional Diagram



Application Information

Design and Product Advantages

The MIC2785's tiny 1.2mm x 1.2mm Thin MLF® package combined with no external components offers several advantages compared to conventional voltage supervisors.

Tremendous savings are captured with decreased board size, reduced circuit complexity, and decreased bill of material (BOM) cost.

Power Supply Input (VDD)

The VDD pin provides a stable input power for the internal circuitry. This insures that the reference circuitry and monitoring circuitry have a stable voltage over the entire operating voltage range.

Supply bypassing is not required. However, bypassing may be valuable depending on the quality of the system voltage to which the VDD pin is connected. If bypassing is added, connect the capacitor(s) as closely as possible to the VDD pin. Place the lowest value capacitors closest to the VDD pin.

Under-Voltage Detector Input (VIN)

The largest portion of the monitoring circuitry is the VIN comparator. The VIN pin is connected to the non-inverting terminal of the comparator. The internal reference is connected to the inverting terminal of the comparator. A reset is triggered when VIN falls below V_{REF}. The VIN pin circuitry includes hysteresis to prevent /RST pin chattering due to noise. The VIN pin is relatively immune to very brief negative-going transients.

Reset Output (/RST)

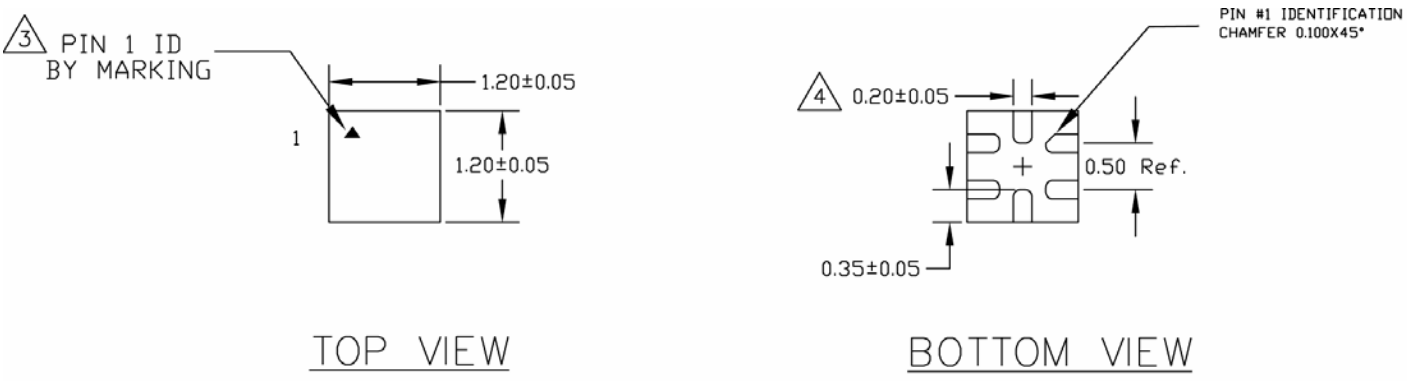
The /RST pin is a complementary push-pull output, which source and sink current. The reset output is asserted any time the VIN pin voltage is less than the threshold voltage ($V_{IN} < V_{TH}$) or the /MR pin is asserted. The /RST pin responds very quickly to reset conditions, typically asserting within 5µs of $V_{IN} < V_{TH}$.

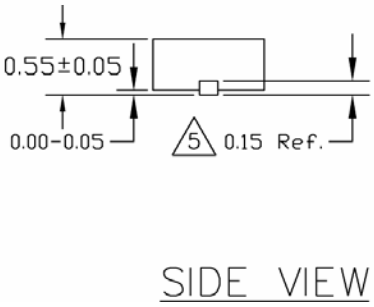
The MIC2785 securely monitors the supply voltage of critical components like microcontrollers and microprocessors. With the MIC2785's /RST pin connected to the µP's reset pin, the processor will be properly reset at power on and during power-down and brown-out conditions.

Manual Reset Input (/MR)

The /MR pin provides the ability to initiate a reset via external logic or a manual switch. This is in addition to the MIC2785's automatic voltage monitoring function. Asserting the /MR input to a logic low causes an immediate and unconditional reset. Assuming the VIN pin voltage is within tolerance when /MR is released (returns high), the reset output will be de-asserted. /MR is internally pulled-up to VDD and may be left floating/ open if unused.

Package Information





NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS, ANGLES ARE IN DEGREES. N IS THE TOTAL NUMBER OF TERMINALS.
2. MAX PACKAGE WARPAGE IS 0.05mm, MAX ALLOWABLE BURRS IS 0.076 mm IN ALL DIRECTIONS.

3 PIN #1 ID ON TOP WILL BE LASER/INK MARKED.

4 DIMENSION APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.20 AND 0.25mm FROM TERMINAL TIP.

5 APPLIED FOR EXPOSED PAD AND TERMINALS.

6-Pin (1.2mm x 1.2mm) Thin MLF® (FL)

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