



High-Side Current-Sense and Internal 1°C Temperature Monitor

PRODUCT FEATURES

Data Brief

General Description

The EMC1701 is a combination high-side current sensing device with precision temperature measurement. It measures the voltage developed across an external sense resistor to represent the high-side current of a battery or voltage regulator. The EMC1701 also measures the bus voltage and uses these measured values to present a proportional power calculation. The EMC1701 contains additional bi-directional peak detection circuitry to flag instantaneous current spikes with programmable time duration and magnitude threshold. Finally, the EMC1701 includes an internal diode channel for ambient temperature measurement.

Both current sensing and temperature monitoring include two tiers of protection: one that can be masked and causes the ALERT pin to be asserted, and the other that cannot be masked and causes the THERM pin to be asserted.

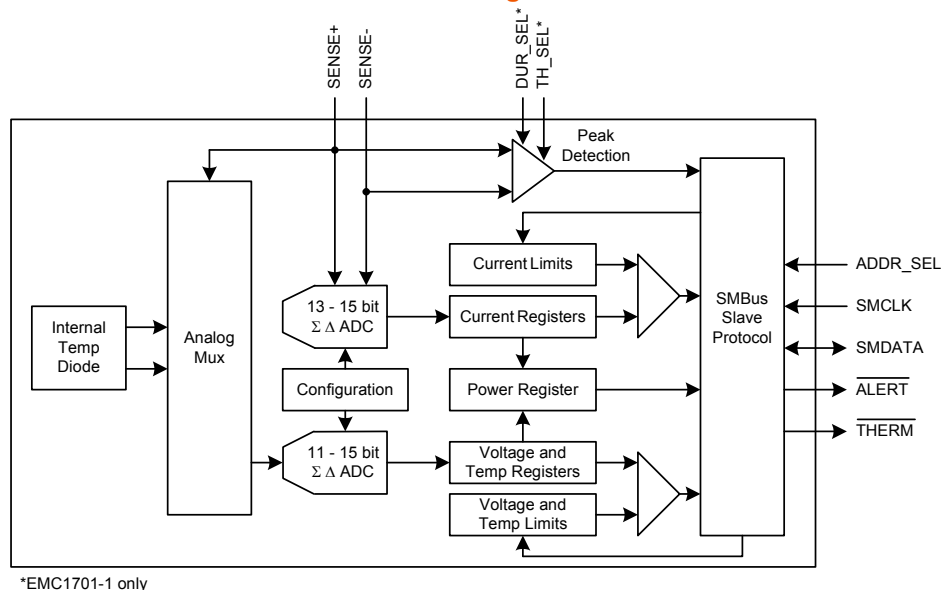
Applications

- Notebook and Desktop Computers
- Industrial
- Power Management Systems
- Embedded Applications

Features

- High-side current sensor
 - Bi-directional current measurement
 - Measures bus voltage and indicates power ratio
 - 1% current measurement accuracy
 - Integrated over 82ms to 2.6sec with 11-bit resolution
 - 3V to 24V voltage bus voltage range
- Independent hardware set instantaneous current peak detector (EMC1701-1 only)
 - Software controls to program time duration and magnitude threshold
- Power supply options
 - Bus or separately powered for low voltage operation
- Wide temperature operating range: -40°C to +85°C
- Internal temperature monitor
 - $\pm 1^\circ\text{C}$ accuracy ($-5^\circ\text{C} < T_A < 85^\circ\text{C}$)
- ALERT and THERM outputs for temperature, voltage, and out-of-current limit reporting
- SMBus 2.0 interface
 - Pin-selectable SMBus Address
 - Block Read and Write
- Available in a 12-pin 4mm x 4mm QFN RoHS Compliant Package (EMC1701-1)
- Available in a 10-pin MSOP RoHS Compliant Package (EMC1701-2)

Block Diagram



Order Number(s):

ORDERING NUMBER	PACKAGE	FEATURES
EMC1701-1-KP-TR	12-pin 4mm x 4mm QFN (Lead-free RoHS compliant)	Internal diode, current sensor, hardware set peak detector
EMC1701-2-AIZL-TR	10-pin MSOP (Lead-free RoHS compliant)	Internal diode, current sensor

REEL SIZE IS 4,000 PIECES

This product meets the halogen maximum concentration values per IEC61249-2-21

For RoHS compliance and environmental information, please visit www.smSC.com/rohs



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Package Outline

EMC1701-1 Package Drawing (12-Pin QFN 4mm x 4mm)

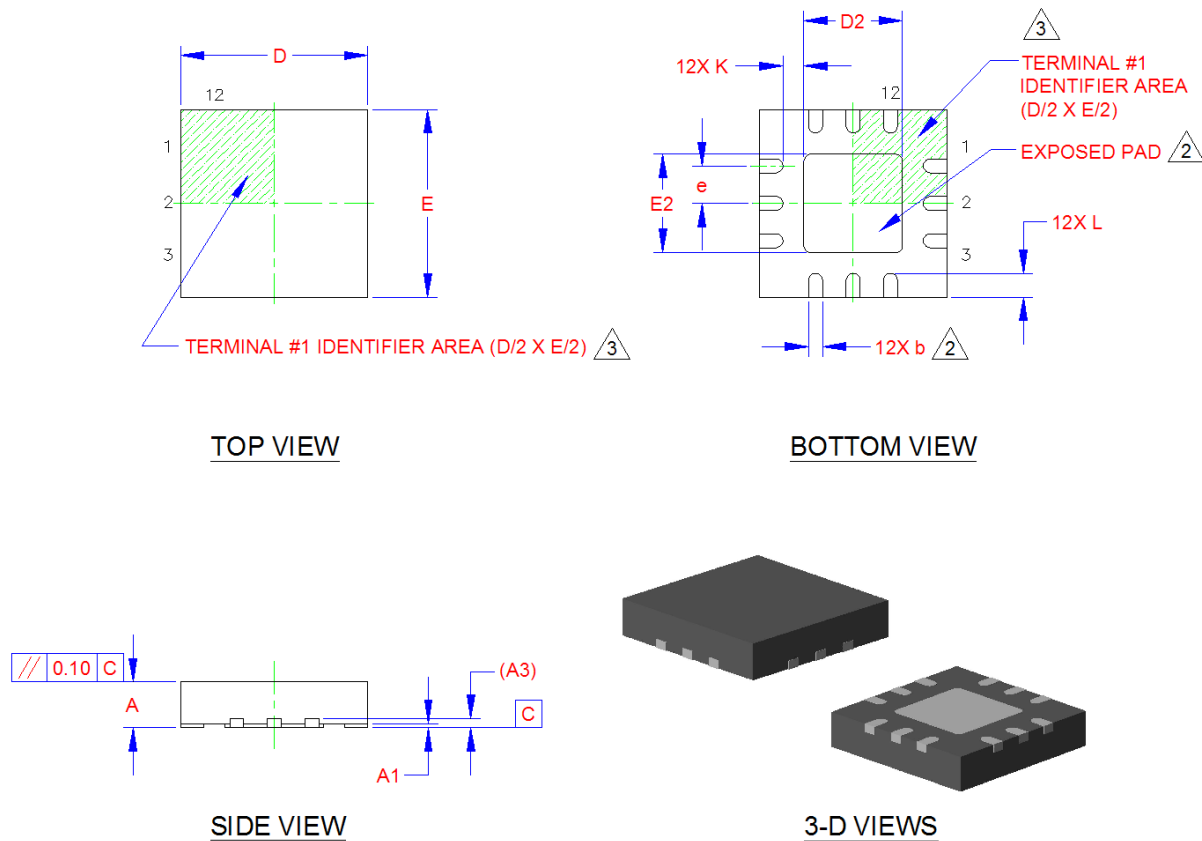
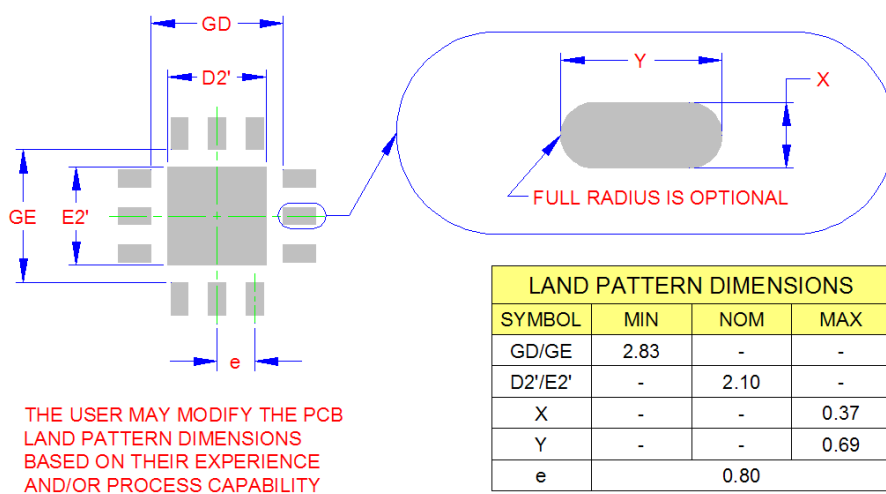


Figure 1 12-Pin QFN 4mm x 4mm Package Drawings

COMMON DIMENSIONS					
SYMBOL	MIN	NOM	MAX	NOTE	REMARK
A	0.80	0.85	0.90	-	OVERALL PACKAGE HEIGHT
A1	0	0.02	0.05	-	STANDOFF
A3	0.20 REF			-	LEAD-FRAME THICKNESS
D/E	3.90	4.00	4.10	-	X/Y BODY SIZE
D2/E2	2.00	2.10	2.20	2	X/Y EXPOSED PAD SIZE
L	0.45	0.50	0.55	-	TERMINAL LENGTH
b	0.25	0.30	0.35	2	TERMINAL WIDTH
K	0.20	-	-	-	TERMINAL TO PAD DISTANCE
e	0.80 BSC			-	TERMINAL PITCH

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. POSITION TOLERANCE OF EACH TERMINAL AND EXPOSED PAD IS $\pm 0.05\text{mm}$ AT MAXIMUM MATERIAL CONDITION. DIMENSIONS "b" APPLIES TO PLATED TERMINALS AND IT IS MEASURED BETWEEN 0.15 AND 0.30 mm FROM THE TERMINAL TIP.
3. DETAILS OF TERMINAL #1 IDENTIFIER ARE OPTIONAL BUT MUST BE LOCATED WITHIN THE AREA INDICATED.

Figure 2 12-Pin QFN 4mm x 4mm Package Dimensions and Notes

RECOMMENDED PCB LAND PATTERN
Figure 3 12-Pin QFN 4mm x 4mm PCB Footprint

EMC1701-2 Package Drawing (10-Pin MSOP)

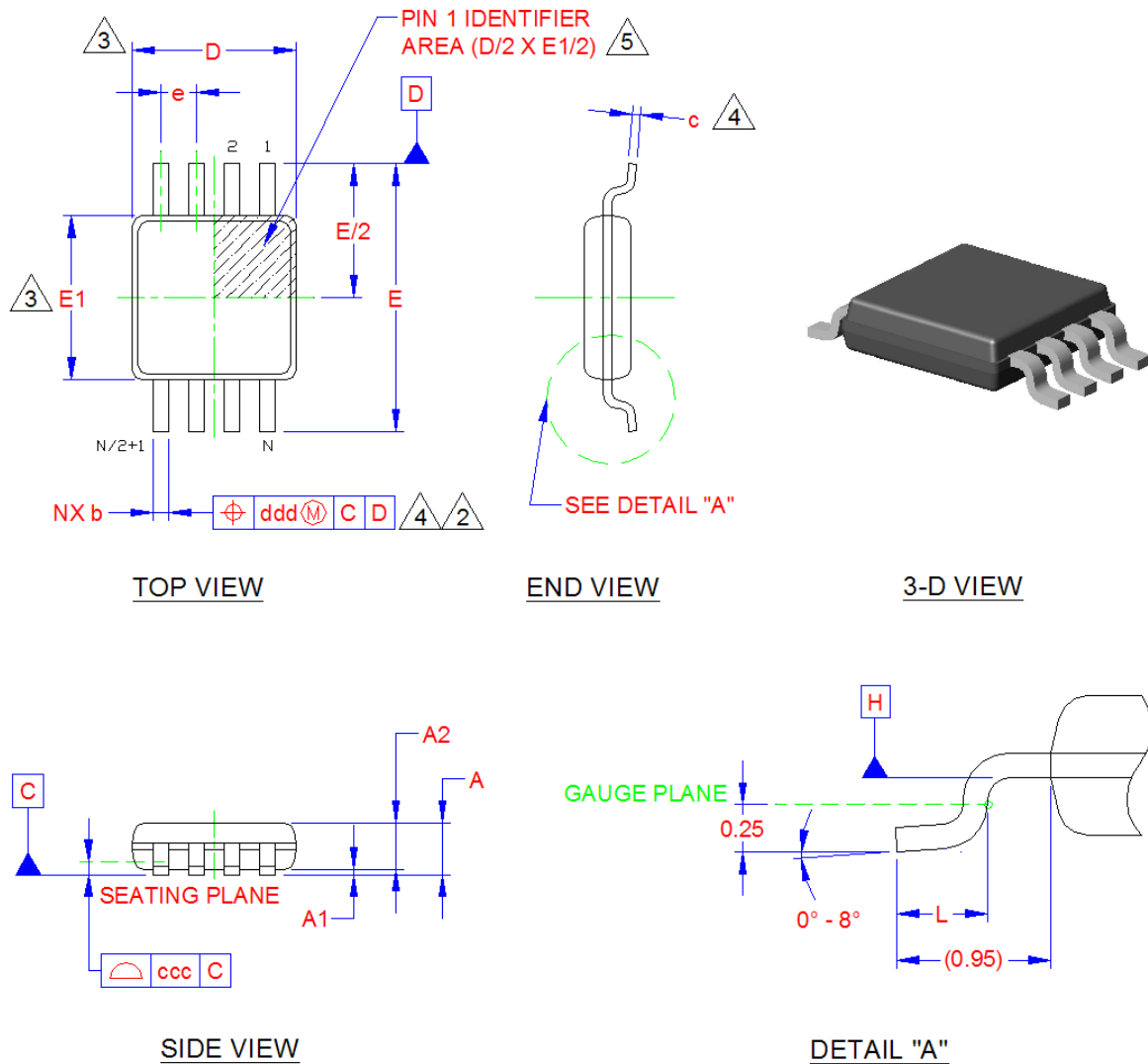


Figure 4 10-Pin MSOP Package Drawings

Symbol	MIN	NOM	MAX	Description / Remark
A	0.80	-	1.10	Overall Package Height
A1	0.05	-	0.15	Standoff
A2	0.75	0.85	0.95	Package Body Thickness
D	2.80	3.00	3.20	X Body Size
E	4.65	4.90	5.15	Lead Span
E1	2.80	3.00	3.20	Y Body Size
L	0.40	-	0.80	Lead Foot Length
b (N = 8)	0.22	-	0.38	Lead Width
b (N = 10)	0.17	-	0.27	
c	0.08	-	0.23	Lead thickness
e (N = 8)	0.65 BSC			Lead Pitch
e (N = 10)	0.50 BSC			
ccc	0	-	0.10	Lead Coplanarity (Bending in Z direction)
ddd (N = 8)	0	-	0.13	Lead Position (Bending in X-Y plane)
ddd (N = 10)	0	-	0.08	

Notes:

1. All dimensions are in millimeters. "N" is the total number of leads.
2. Dimension "b" does not include dambar protrusion. Dambar cannot be located on the lower radius of the foot.
3. Dimension "D" does not include mold protrusions or flash. Maximum mold protrusions or flash is 0.15mm per end, and per side. Dimensions "D" & "E1" are determined at the datum plane "H".
4. Dimensions "b" and "c" apply to the flat section of the lead, between 0.08 to 0.15mm from the lead tip.
5. Details of pin 1 identifier are optional, but must be located within the index area indicated.

Figure 5 10-Pin MSOP Package Dimensions and Notes

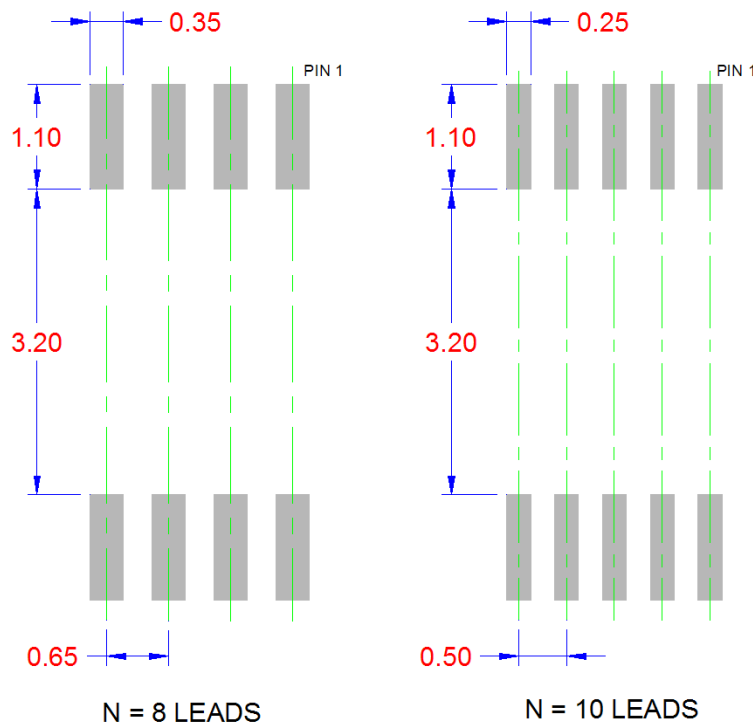


Figure 6 10-Pin MSOP PCB Footprint