REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

Prepared in accordance with ASME Y14.24

Vendor item drawing

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PMIC N/A	**PREPARED BY** Phu H. Nguyen	**DLA LAND AND MARITIME** **COLUMBUS, OHIO 43218-3990** **http://www.dscc.dla.mil**
Original date of drawing YY MM DD 11-07-14	**CHECKED BY** Phu H. Nguyen **APPROVED BY** Thomas M. Hess	**TITLE** MICROCIRCUIT, DIGITAL, MICROPROCESSOR VOLTAGE MONITORS WITH PROGRAMMABLE VOLTAGE DETECTION, MONOLITHIC SILICON
	SIZE **A** **CODE IDENT. NO.** **16236**	**DWG NO.** **V62/09633**
	REV	**PAGE** 1 **OF** 10

AMSC N/A

5962-V058-11

1. SCOPE

1.1 Scope. This drawing documents the general requirements of a high performance microprocessor voltage monitor with programmable voltage detection microcircuit, with an operating temperature range of -55°C to +125°C.

1.2 Vendor Item Drawing Administrative Control Number. The manufacturer's PIN is the item of identification. The vendor item drawing establishes an administrative control number for identifying the item on the engineering documentation:

V62/09633	-	01	X	B
Drawing number		Device type (See 1.2.1)	Case outline (See 1.2.2)	Lead finish (See 1.2.3)

1.2.1 Device type(s).

Device type	Generic	Circuit function
01	MAX8211	Microprocessor voltage monitors with programmable voltage detection
02	MAX8212	Microprocessor voltage monitors with programmable voltage detection

1.2.2 Case outline(s). The case outlines are as specified herein.

Outline letter	Number of pins	JEDEC PUB 95	Package style
X	8	JEDEC MS012	Small outline

1.2.3 Lead finishes. The lead finishes are as specified below or other lead finishes as provided by the device manufacturer:

Finish designator	Material
A	Hot solder dip
B	Tin-lead plate
C	Gold plate
D	Palladium
E	Gold flash palladium
Z	Other

1.3 Absolute maximum ratings. 1/

Supply voltage	-0.5 V to +18 V
Output voltage	-0.5 V to +18 V
Hysteresis	+0.5 V to -18 V with respect to (V+ + 0.5 V)
Threshold input voltage	-0.5 V to (V+ + 0.5 V)
Current into any terminal	±50 mA
Continuous power dissipation (T_A = +70°C)	
Case outline X (derate 5.88 mW/°C above +70°C)	471 mW
Operating temperature range	-55°C to +125°C
Storage temperature range	-65°C to 150°C
Lead temperature (soldering , 10 sec)	+300°C
Electro Static Discharge (ESD)	
Human Body Model (HBM)	800 V
Class	1B
Moisture Sensitive Level (MSL)	Level 1

1.4 Thermal data table.

Case outline letter	X	X	Units
PC Board	Single Layer	Multi-Layer 2/	
Power dissipation (P_D), maximum at +70°C	471	588	mW
Power dissipation (P_D) derating above +70°C	5.9	7.4	mW/°C
Thermal resistance, junction to case (θ_{JC})	40	38	°C/W
Thermal resistance, junction to ambient (θ_{JA})	170	136	°C/W

2. APPLICABLE DOCUMENTS

JEDEC – SOLID STATE TECHNOLOGY ASSOCIATION (JEDEC)

JEDEC PUB 95 – Registered and Standard Outlines for Semiconductor Devices
JEDEC STD 51-7 – High Effective Thermal Conductivity Test Board for Leaded Surface Mount Packages

(Copies of these documents are available online at http:/www.jedec.org or from JEDEC – Solid State Technology Association, 3103 North 10th Street, Suite 240–S, Arlington, VA 22201.)

1/ Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

2/ Package thermal resistances were obtained using the method described in JEDEC specification JESD51-7, using a four-layer board. For detailed information on package thermal considerations, refer to manufacturer data.

3. REQUIREMENTS

3.1 Marking. Parts shall be permanently and legibly marked with the manufacturer's part number as shown in 6.3 herein and as follows:

A. Manufacturer's name, CAGE code, or logo
B. Pin 1 identifier
C. ESDS identification (optional)

3.2 Unit container. The unit container shall be marked with the manufacturer's part number and with items A and C (if applicable) above.

3.3 Electrical characteristics. The maximum and recommended operating conditions and electrical performance characteristics are as specified in 1.3, 1.4, and table I herein.

3.4 Design, construction, and physical dimension. The design, construction, and physical dimensions are as specified herein.

3.5 Diagrams.

3.5.1 Case outline. The case outline shall be as shown in 1.2.2 and figure 1.

3.5.2 Terminal connections. The terminal connections shall be as shown in figure 2.

3.5.3 Block diagram. The block diagram shall be as shown in figure 3.

3.5.4 Threshold trip voltage vs ambient temperature. The threshold trip voltage vs ambient temperature shall be as shown in figure 4.

3.5.5 Basic overvoltage/undervoltage circuit. The basic overvoltage/undervoltage circuit shall be as shown in figure 5.

3.5.6 Logic supply low voltage detector. The logic supply low voltage detector shall be as shown in figure 6.

TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions 2/		Device type	Limits		Unit
					Min	Max	
Supply current	I+	2 V ≤ V+ ≤ 16.5 V GND ≤ V_{TH} ≤ V+	T_A = 25°C	All		15	µA
			T_A = -55°C to +125°C			20	
Threshold trip voltage	V_{TH}	T_A = 25°C	V+ = 16.5 V, I_{OUT} = 4 mA		1.11	1.19	V
			V+ = 2 V, I_{OUT} = 500 µA				
		T_A = -55°C to +125°C	V+ = 16.5 V, I_{OUT} = 3 mA		1.05	1.25	
			V+ = 2.2 V, I_{OUT} = 500 µA				
Threshold voltage disparity between output and hysteresis output	V_{THP}	I_{OUT} = 4 mA, I_{HYST} = 1 mA			±0.1 TYP		mV
Guaranteed operating supply voltage range	V_{SUPP}	T_A = 25°C			2.0	16.5	V
		T_A = -55°C to +125°C			2.2	16.5	
Typical operating supply voltage range	V_{SUPP}				1.5	16.5	
Threshold voltage temperature coefficient	$\Delta V_{TH}/\Delta T$	See figure 4			-200 TYP		ppm/°C
Variation of threshold voltage with supply voltage	ΔV_{TH}	V+ = 4.5 V to 5.5 V		01	1.0		mV
				02	0.2		
Threshold input current	I_{TH}	0 V ≤ V_{TH} ≤ V+, T_A = 25°C		All		10	nA
		T_A = -55°C to +125°C				20	
Output leakage current	I_{LOUT}	T_A = -55°C to +125°C	V_{OUT} = 16.5 V, V_{TH} = 0.9 V	01		30	µA
			V_{OUT} = 16.5 V, V_{TH} = 1.3 V	02		30	
			V_{OUT} = 5 V, V_{TH} = 0.9 V	01		10	
			V_{OUT} = 5 V, V_{TH} = 1.3 V	02		10	
Output saturation voltage	V_{OL}	I_{OUT} = 2 mA, V_{TH} = 1.0 V		01		0.4	V
		I_{OUT} = 2 mA, V_{TH} = 1.3 V		02		0.4	
Maximum available output current	I_{OH}	V_{OUT} = 5 V	V_{TH} = 1.0 V 3/	01	4		mA
			V_{TH} = 1.3 V 4/	02	12		
Hysteresis leakage current	I_{LHYS}	T_A = -55°C to +125°C, V+ = 16.5 V, V_{TH} = 0.9 V V_{HYST} = -16.5 V with respect to V+		All		3	
Hysteresis saturation voltage	$V_{HYS(MAX)}$	I_{HYST} = 0.5 mA, V_{TH} = 1.3 V measured with respect to V+		All		-0.2	V
Maximum available hysteresis current	$I_{HYS(MAX)}$	V_{TH} = 1.3 V, V_{HYS} = 0 V		All	2		mA

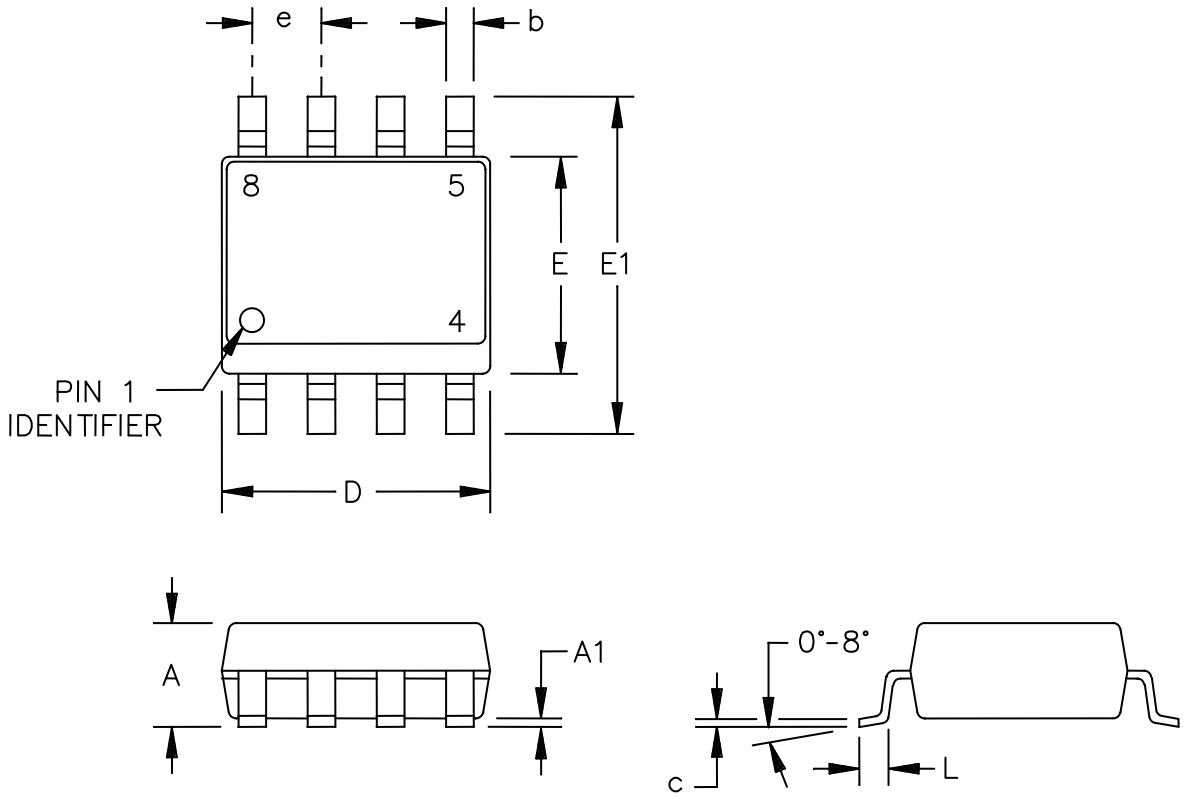
1/ Testing and other quality control techniques are used to the extent deemed necessary to assure product performance over the specified temperature range. Product may not necessarily be tested across the full temperature range and all parameters may not necessarily be tested. In the absence of specific parametric testing, product performance is assured by characterization and/or design.

2/ V+ = 5 V, T_A = 25°C, unless otherwise noted.

3/ The maximum output current of the device type 01 is limited by design to 30 mA under any operating condition. The output voltage may be sustained at any voltage up to +16.5 V as long as the maximum power dissipation of the device is not exceeded.

4/ The maximum output current of the device type 02 is not defined, and system using device type 02 must therefore ensure that the output current does not exceed 50 mA and that the maximum power dissipation of the device is not exceeded.

Case X



Dimensions									
Symbol	Inches		Millimeters		Symbol	Inches		Millimeters	
	Min	Max	Min	Max		Min	Max	Min	Max
A	.053	.069	1.35	1.75	E	.150	.157	3.80	4.00
A1	.004	.010	0.10	0.25	E1	.228	.244	5.80	6.20
b	.014	.019	0.35	0.49	e	.050 BSC		1.27 BSC	
c	.007	.010	0.19	0.25	L	.016	.050	0.40	1.27
D	.189	.167	4.80	5.00					

NOTES:
1. D and E do not include mold flash.
2. Mold flash or protrusions not to exceed 0.15 mm (.006”).
3. Leads to be coplanar within 0.10 mm (.004”).
4. Meets JEDEC MS013.

FIGURE 1. Case outline.

Case outline: X			
Terminal number	Terminal symbol	Terminal number	Terminal symbol
1	NC	5	GND
2	HYST	6	NC
3	THRES	7	NC
4	OUT	8	v+

NC = Not connect

FIGURE 2. Terminal connections.

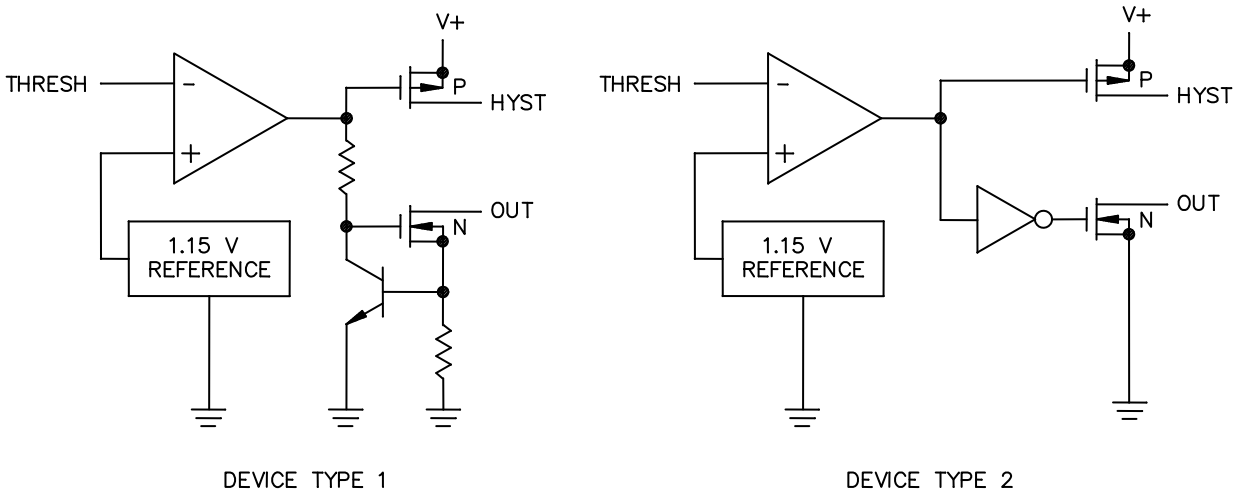


FIGURE 3. Block diagram.

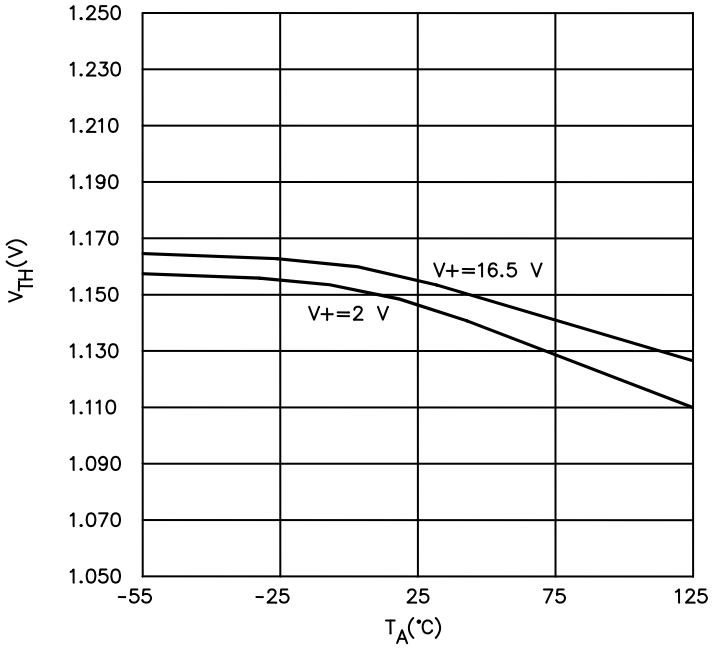


FIGURE 4. Threshold trip voltage vs ambient temperature.

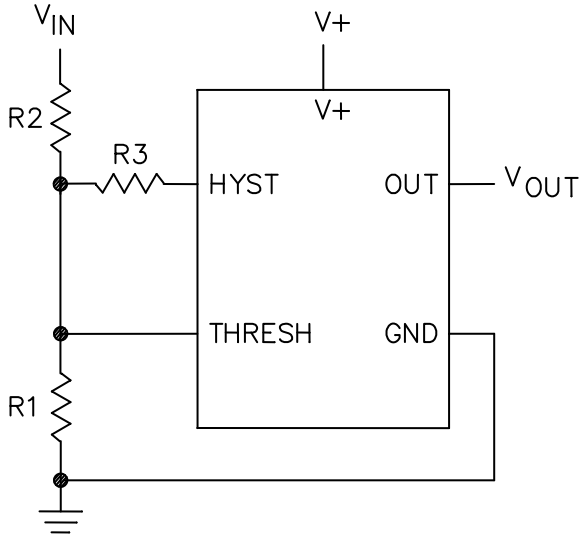


FIGURE 5. Basic overvoltage/undervoltage circuit.

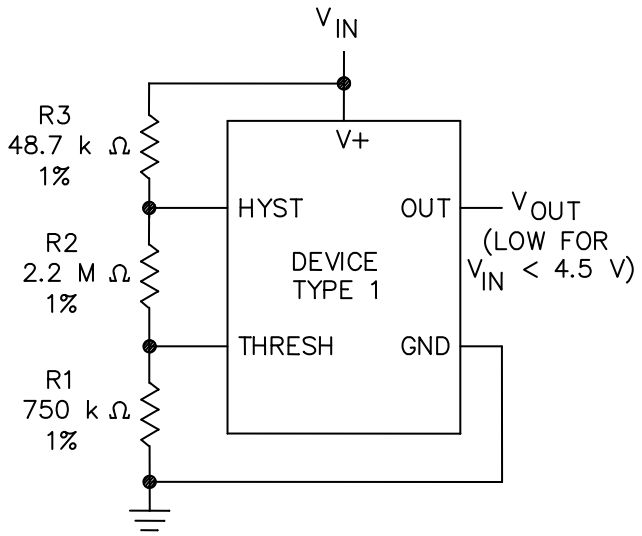


FIGURE 6. Logic supply low voltage detector.

4. VERIFICATION

4.1 Product assurance requirements. The manufacturer is responsible for performing all inspection and test requirements as indicated in their internal documentation. Such procedures should include proper handling of electrostatic sensitive devices, classification, packaging, and labeling of moisture sensitive devices, as applicable.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Preservation, packaging, labeling, and marking shall be in accordance with the manufacturer's standard commercial practices for electrostatic discharge sensitive devices.

6. NOTES

6.1 ESDS. Devices are electrostatic discharge sensitive and are classified as ESDS class 1 minimum.

6.2 Configuration control. The data contained herein is based on the salient characteristics of the device manufacturer's data book. The device manufacturer reserves the right to make changes without notice. This drawing will be modified as changes are provided.

6.3 Suggested source(s) of supply. Identification of the suggested source(s) of supply herein is not to be construed as a guarantee of present or continued availability as a source of supply for the item.

Vendor item drawing administrative control number 1/	Device manufacturer CAGE code	Vendor part number	
V62/09633-01XB	1ES66	MAX8211MSA/PR	MAX8211MSA/PR-T 2/
V62/09633-02XB 3/	1ES66	MAX8212MSA/PR	MAX8212MSA/PR-T 2/

1/ The vendor item drawing establishes an administrative control number for identifying the item on the engineering documentation.
2/ For tape and reel.
3/ Contact the manufacturer for availability.

CAGE code	Source of supply
1ES66	Maxim Integrated Products 120 San Gabriel Dr Sunnyvale, CA 94086-5125