REVISIONS			
LTR	**DESCRIPTION**	**DATE**	**APPROVED**
A	Add device types 04, 05, and 06 with an operating temperature range of -55°C to +125°C.	05-02-07	R. MONNIN
B	Make corrections to the notes under figure 1. Updating boilerplate paragraphs to current requirements. - ro	10-12-14	C. SAFFLE

CURRENT DESIGN ACTIVITY CAGE CODE 16236
HAS CHANGED NAMES TO:
DLA LAND AND MARITIME
COLUMBUS, OHIO 43218-3990

Prepared in accordance with ASME Y14.24

Vendor item drawing

REV																					
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REV STATUS OF PAGES	**REV**	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
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PMIC N/A	**PREPARED BY** RICK OFFICER	**DEFENSE SUPPLY CENTER COLUMBUS** **COLUMBUS, OHIO 43218-3990**
Original date of drawing YY-MM-DD 04-02-11	**CHECKED BY** TOM HESS	**TITLE** MICROCIRCUIT, LINEAR, VOLTAGE DETECTOR, MONOLITHIC SILICON
	APPROVED BY RAYMOND MONNIN	
	SIZE **A** / **CODE IDENT. NO.** **16236**	**DWG NO.** **V62/04648**
	REV **B**	**PAGE** 1 **OF** 15

AMSC N/A

5962-V076-10

1. SCOPE

1.1 Scope. This drawing documents the general requirements of a high performance voltage detector microcircuit, with an operating temperature range of -40°C to +125°C for device types 01, 02, 03, and an operating temperature range of -55°C to +125°C for device types 04, 05, 06.

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:

V62/04648	-	01	X	E
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	TPS3803-01Q-EP	Voltage detector
02	TPS3803G15Q-EP	Voltage detector
03	TPS3805H33Q-EP	Voltage detector
04	TPS3803-01M-EP	Voltage detector
05	TPS3803G15M-EP	Voltage detector
06	TPS3805H33M-EP	Voltage detector

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

Outline letter	Number of pins	JEDEC PUB 95	Package style
X	5	MO-203	Plastic small outline

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

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 range (V_{DD}) ..... 7 V 2/
All other pins ..... -0.3 V to 7 V 2/
Maximum low output current (I_{OL}) ..... 5 mA
Maximum high output current (I_{OH}) ..... -5 mA
Input clamp current (I_{IK}) ($V_I < 0$ or $V_I > V_{DD}$) ..... ±10 mA
Output clamp current (I_{OK}) ($V_O < 0$ or $V_O > V_{DD}$) ..... ±10 mA
Continuous total power dissipation (P_D) ..... See dissipation rating table
Operating free air temperature range (T_A) ..... -55°C to +125°C
Storage temperature range (T_{STG}) ..... -65°C to +150°C 3/
Soldering temperature ..... +260°C

1.4 Recommended operating conditions. 4/

Supply voltage range (V_{DD}) ..... 1.3 V minimum to 6 V maximum
Input voltage range (V_I) ..... 0 V minimum to V_{DD} + 0.3 V maximum
Operating free-air temperature range (T_A) :
Device types 01, 02, 03 ..... -40°C to +125°C
Device types 04, 05, 06 ..... -55°C to +125°C

Dissipation rating table

Package	$T_A < 25°C$ power rating	Derating factor above $T_A = 25°$ C	$T_A = 70°C$ power rating	$T_A = 85°C$ power rating
DCK	321 mW	2.6 mW/°C	206 mW	167 mW

1/ Stresses beyond those listed under “absolute maximum rating” 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/ All voltage values are with respect to GND. For reliable operation the device should not be continuously operated at 7 V for more than t = 1000 h.
3/ Long term high temperature storage and/or extended use at maximum recommended operating conditions may result in a reduction of overall device life. See manufacturer’s website for additional information on enhanced plastic packaging.
4/ Use of this product beyond the manufacturers design rules or stated parameters is done at the user’s risk. The manufacturer and/or distributor maintain no responsibility or liability for product used beyond the stated limits.

2. APPLICABLE DOCUMENTS

JEDEC PUB 95 – Registered and Standard Outlines for Semiconductor Devices

(Applications for copies should be addressed to the Electronic Industries Alliance, 2500 Wilson Boulevard, Arlington, VA 22201-3834 or online at http://www.jedec.org)

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 Truth table. The truth table shall be as shown in figure 3.

3.5.4 Logic diagram. The logic diagram shall be as shown in figure 4.

3.5.5 Timing waveforms. The timing waveforms shall be as shown in figure 5.

TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
High level output voltage	V_{OH}	V_{DD} = 1.5 V, I_{OH} = -0.5 mA	-40°C to +125°C	03	0.8 x V_{DD}		V
		V_{DD} = 3.3 V, I_{OH} = -1.0 mA			0.8 x V_{DD}		
		V_{DD} = 6 V, I_{OH} = -1.5 mA			0.8 x V_{DD}		
		V_{DD} = 1.5 V, I_{OH} = -0.5 mA	-55°C to +125°C	06	0.8 x V_{DD}		
		V_{DD} = 3.3 V, I_{OH} = -1.0 mA			0.8 x V_{DD}		
		V_{DD} = 6 V, I_{OH} = -1.5 mA			0.8 x V_{DD}		
Low level output voltage	V_{OL}	V_{DD} = 1.5 V, I_{OH} = 1.0 mA	-40°C to +125°C	01,02, 03		0.3	V
		V_{DD} = 3.3 V, I_{OH} = 2 mA				0.3	
		V_{DD} = 6 V, I_{OH} = 3 mA				0.3	
		V_{DD} = 1.5 V, I_{OH} = 1.0 mA	-55°C to +125°C	04,05, 06		0.3	
		V_{DD} = 3.3 V, I_{OH} = 2 mA				0.3	
		V_{DD} = 6 V, I_{OH} = 3 mA				0.3	
Power up reset voltage		V_{IT} > 1.5 V 2/	T_A = 25°C	01,02, 03	0.8		V
		V_{IT} ≤ 1.5 V 2/			1.0		
		V_{IT} > 1.5 V 2/	T_A = 25°C	04,05, 06	0.8		
		V_{IT} ≤ 1.5 V 2/			1.0		

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Negative going input threshold voltage	V_{IT}	SENSE 3/	-40°C to +125°C	01,02, 03	1.200	1.244	V
		3/		02	1.379	1.421	
				03	3.004	3.096	
		SENSE 3/	-55°C to +125°C	04,05, 06	1.200	1.244	
		3/		05	1.379	1.421	
				06	3.004	3.096	
Hysteresis	H_{hys}	$1.2 < V_{IT} < 2.5$ V	-40°C to +125°C	01,02, 03	15 typical		mV
		$2.5 < V_{IT} < 3.5$ V			30 typical		
		$1.2 < V_{IT} < 2.5$ V	-55°C to +125°C	04,05, 06	15 typical		
		$2.5 < V_{IT} < 3.5$ V			30 typical		
Input current	I_I	SENSE	-40°C to +125°C	01,02, 03	-25	25	nA
		SENSE	-55°C to +125°C	04,05, 06	-25	25	
High level output current at $\overline{\text{RESET}}$	I_{OH}	Open drain only, $V_{OH} = V_{DD}$, $V_{DD} = V_{IT} + 0.2$ V	-40°C to +125°C	01,02, 03		300	nA
		Open drain only, $V_{OH} = V_{DD}$, $V_{DD} = V_{IT} + 0.2$ V	-55°C to +125°C	04,05, 06		300	
Supply current	I_{DD}	$V_{DD} = 3.3$ V, output unconnected	-40°C to +125°C	01		4	µA
				02,03		5	
		$V_{DD} = 6$ V, output unconnected		01		4	
				02,03		6	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Supply current	I_{DD}	V_{DD} = 3.3 V, output unconnected	-55°C to +125°C	04		4	µA
				05,06		5	
		V_{DD} = 6 V, output unconnected		04		4	
				05,06		6	
Input capacitance	C_I	V_I = 0 V to V_{DD}	-40°C to +125°C	01,02, 03	1 typical		pF
		V_I = 0 V to V_{DD}	-55°C to +125°C	04,05, 06	1 typical		
Timing requirements section		R_L = 1 MΩ, C_L = 50 pF					
Pulse width	t_W	At V_{DD}, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}	-40°C to +125°C	01,02, 03	5.5		µs
		At SENSE, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}			5.5		
		At V_{DD}, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}	-55°C to +125°C	04,05, 06	5.5		
		At SENSE, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}			5.5		
Switching characteristics section		R_L = 1 MΩ, C_L = 50 pF					
Propagation (delay) time, high-to-low level output	t_{PHL}	V_{DD} to $\overline{\text{RESET}}$ delay, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}	-40°C to +125°C	01,02, 03		100	µs
		SENSE to $\overline{\text{RESET}}$ delay, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}				100	
		V_{DD} to $\overline{\text{RESET}}$ delay, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}	-55°C to +125°C	04,05, 06		100	
		SENSE to $\overline{\text{RESET}}$ delay, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}				100	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Switching characteristics section – continued. R_L = 1 MΩ, C_L = 50 pF							
Propagation (delay) time, low-to-high level output	t_{PLH}	V_{DD} to $\overline{\text{RESET}}$ delay, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}	-40°C to +125°C	01,02, 03		100	µs
		SENSE to $\overline{\text{RESET}}$ delay, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}				100	
		V_{DD} to $\overline{\text{RESET}}$ delay, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}	-55°C to +125°C	04,05, 06		100	
		SENSE to $\overline{\text{RESET}}$ delay, V_{IH} = 1.05 x V_{IT}, V_{IL} = 0.95 x V_{IT}				100	

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/ The lowest supply voltage at which $\overline{\text{RESET}}$ (V_{OL} max = 0.2 V, I_{OL} = 50 µA) becomes active. $t_r(V_{DD}) \geq 15$ µs/V.

3/ To ensure the best stability of the threshold voltage, place a bypass capacitor (ceramic, 0.1 µF) near the supply terminals.

Case X

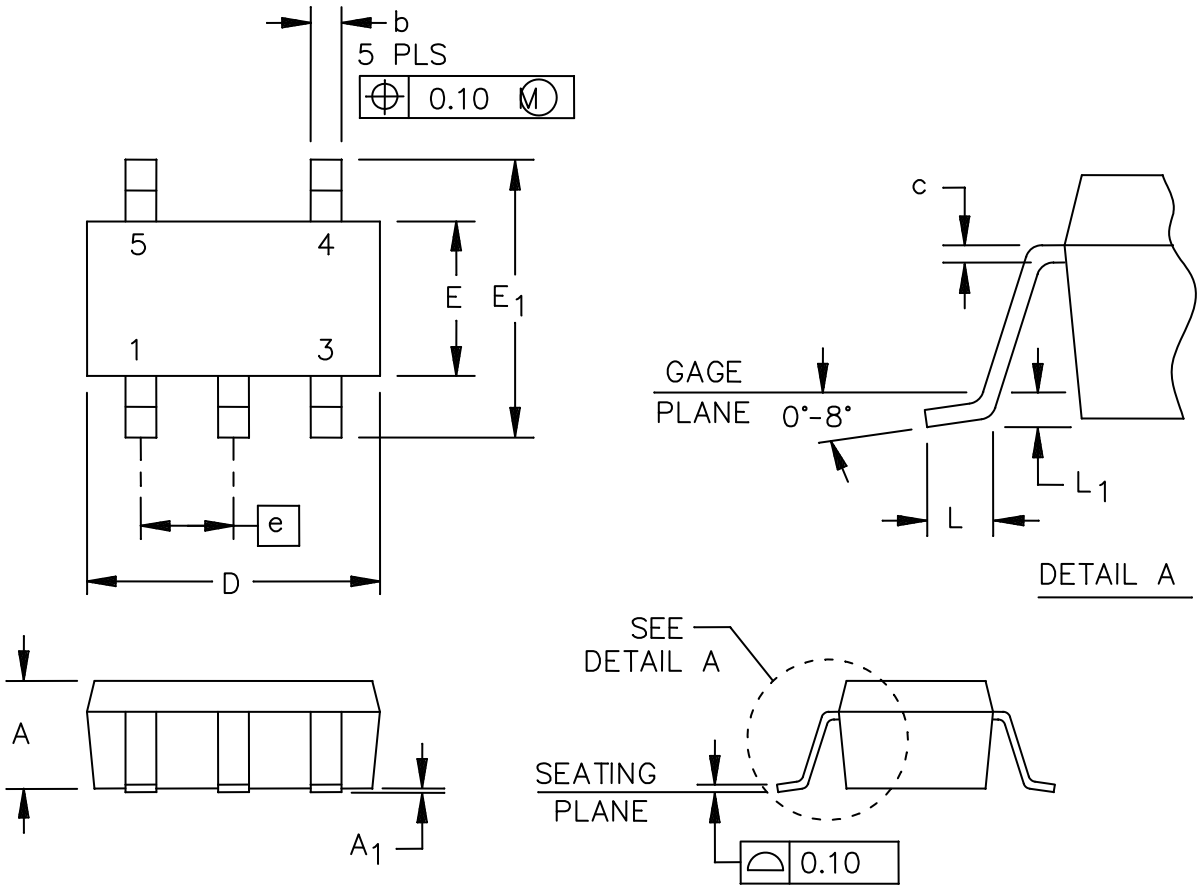

FIGURE 1. Case outline.

DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO	SIZE A	CODE IDENT NO. 16236	DWG NO. V62/04648
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Case X

Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.0315	0.0433	0.80	1.10
A1	---	0.0039	---	0.10
b	0.0059	0.0118	0.15	0.30
c	0.0051 nominal		0.13 nominal	
D	0.0728	0.0846	1.85	2.15
E	0.0433	0.0551	1.10	1.40
E1	0.0708	0.0945	1.80	2.40
L	0.0102	0.0181	0.26	0.46
L1	---	0.0059	---	0.15
n		5		5

Notes:

1. Controlling dimensions are millimeter, inch dimensions are given for reference only.
2. Body dimensions do not include mold flash, protrusion, or gate burrs. Mold flash, protrusion, or gate burrs shall not exceed 0.15 mm (0.006 inch) per end.
3. Fall within JEDEC MO-203.

FIGURE 1. Case outline – Continued.

Device types	01, 03, 04, 06	02, 05
Case outline	X	
Terminal number	Terminal symbol	
1	NC	NC
2	GND	GND
3	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$
4	V_{DD}	V_{DD}
5	SENSE	NC

Terminal number	I/O	Description
1	---	No internal connection
2	I	Ground
3	O	Active low rest output Device types 01 02, 04, and 05 open drain. Device types 03 and 06 push/pull.
4	I	Input supply voltage. Fixed sense input for device types 02, 03, 04, and 06.
5	I	Adjustable sense input. Device types 01, 03, 04, and 06.
	---	No internal connection. Device types 02 and 05

FIGURE 2. Terminal connections.

Device types 01 and 04	
SENSE > V_{IT}	$\overline{\text{RESET}}$
0	L
1	H

Device types 02 and 05	
V_{DD} > V_{IT}	$\overline{\text{RESET}}$
0	L
1	H

Device types 03 and 06		
V_{DD} > V_{IT}	SENSE > V_{IT}	$\overline{\text{RESET}}$
0	0	L
0	1	L
1	0	L
1	1	H

FIGURE 3. Truth tables.

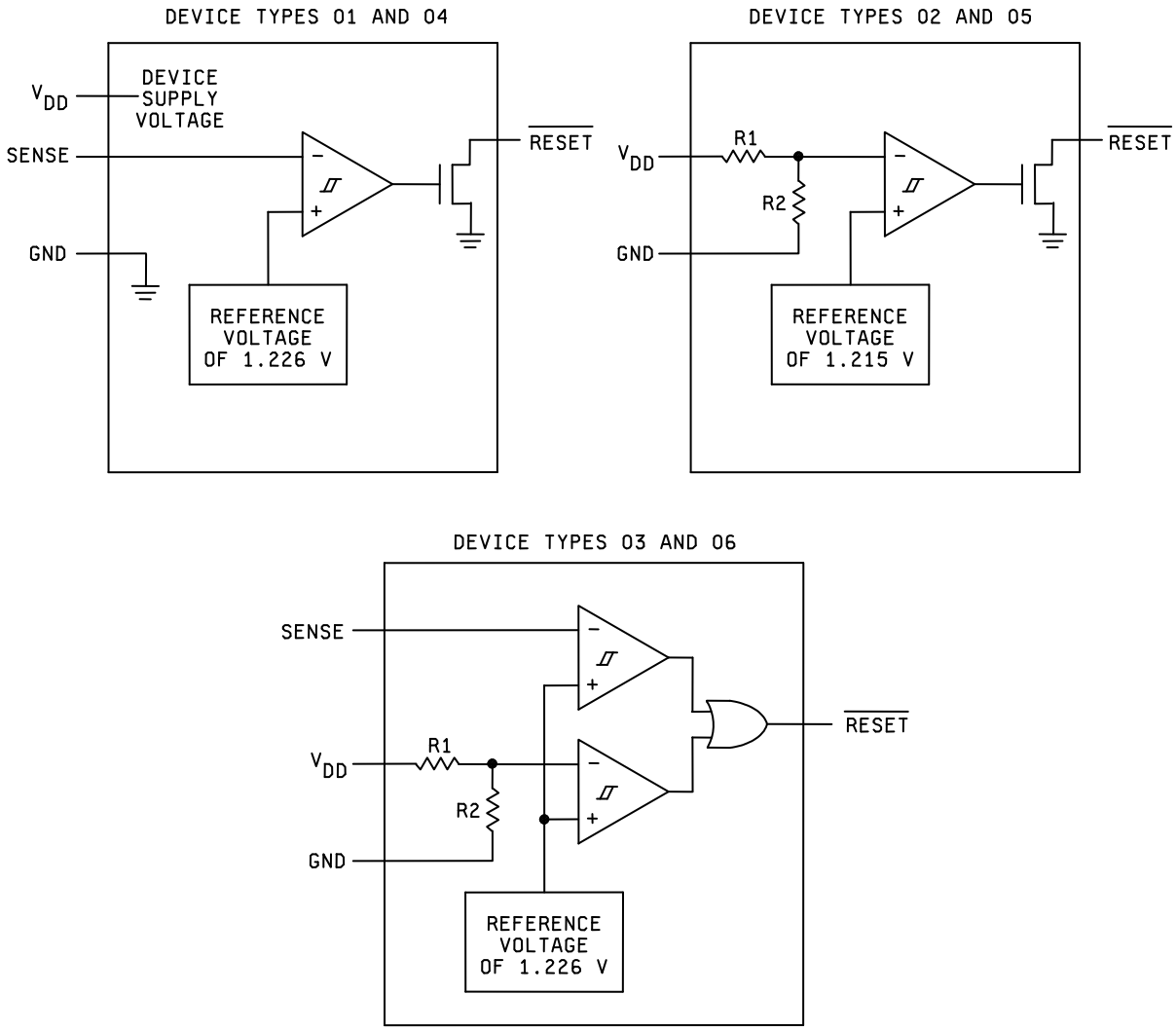

FIGURE 4. Logic diagram.

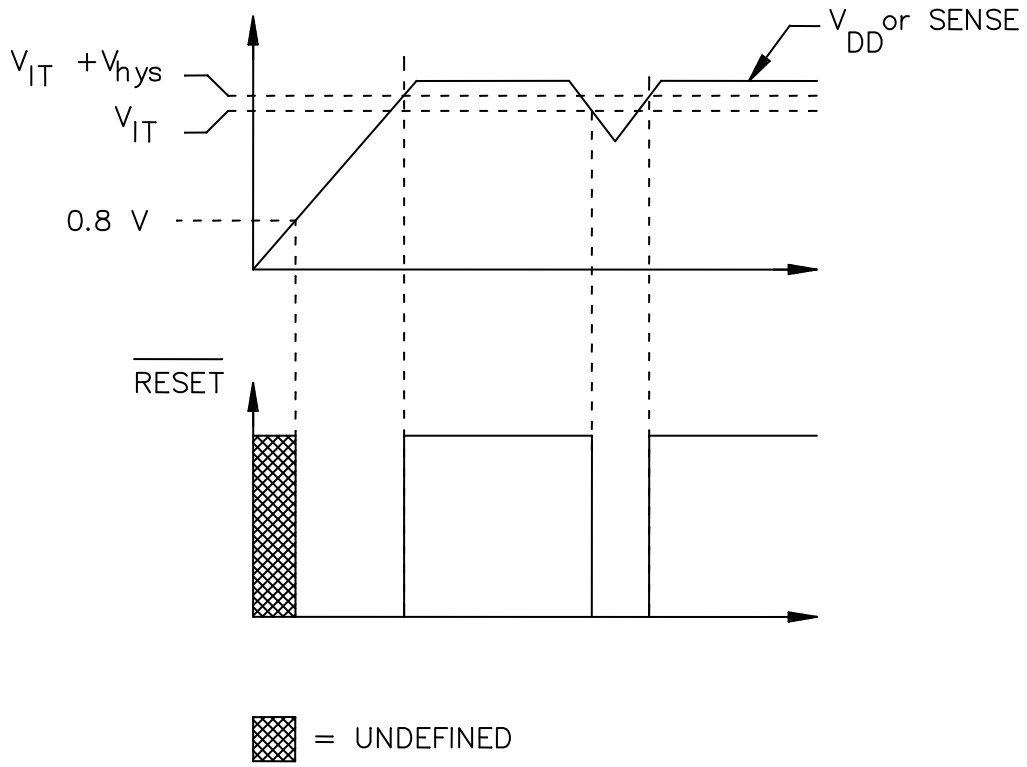

FIGURE 5. Timing waveforms.

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	Threshold voltage		Marking	Vendor part number 2/
		V_{DD}	SENSE		
V62/04648-01XE	01295	NA	1.226 V	AWH	TPS3803-01QDCKREP
V62/04648-02XE	01295	1.40 V	NA	AXT	TPS3803G15QDCKREP
V62/04648-03XE	01295	3.05 V	1.226 V	AWY	TPS3805H33QDCKREP
V62/04648-04XE	01295	NA	1.226 V	BAY	TPS3803-01MDCKREP
V62/04648-05XE	01295	1.40 V	NA	ARH	TPS3803G15MDCKREP
V62/04648-06XE	01295	3.05 V	1.226 V	ARJ	TPS3805H33MDCKREP

1/ The vendor item drawing establishes an administrative control number for identifying the item on the engineering documentation.
2/ The DCKR passive indicates tape and reel containing 3000 parts.

CAGE code	Source of supply
01295	Texas Instruments, Inc. Semiconductor Group 8505 Forest Lane P.O. Box 660199 Dallas, TX 75243 Point of contact: U.S. Highway 75 South P.O. Box 84, M/S 853 Sherman, TX 75090-9493