



1. SCOPE

1.1 Scope. This drawing documents the general requirements of a high performance 150 mA low dropout voltage regulator 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:

<u>V62/07636</u>   Drawing number	-	<u>01</u>   Device type (See 1.2.1)	<u>X</u>   Case outline (See 1.2.2)	<u>E</u>   Lead finish (See 1.2.3)
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1.2.1 Device type(s).

<u>Device type</u>	<u>Generic</u>	<u>Circuit function</u>
01	TPS72118-EP	150 mA low dropout voltage regulator

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

<u>Outline letter</u>	<u>Number of pins</u>	<u>JEDEC PUB 95</u>	<u>Package style</u>
X	5	MO-178-AA	Plastic surface mount

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

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

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07636</b>
		REV    A	PAGE    2

1.3 Absolute maximum ratings. 1/ 2/

Voltage range at IN pin .....	-0.3 V to 7 V
Voltage range at EN pin .....	-0.3 V to 7 V
Voltage on OUT, FB, NC pins .....	-0.3 V to $V_I + 0.3$ V
Peak output current .....	Internally limited
Electrostatic (ESD) rating:	
Human body model (HBM) .....	3 kV
Continuous total power dissipation ( $P_D$ ) .....	See 1.5, dissipation rating table
Operating junction temperature range ( $T_J$ ) .....	-55°C to +150°C
Storage temperature range ( $T_{STG}$ ) .....	-65°C to +150°C

1.4 Recommended operating conditions. 3/

Operating junction temperature range ( $T_J$ ) .....	-55°C to +125°C
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1.5 Package dissipation rating table.

Board	$\theta_{JC}$	$\theta_{JA}$	Derating factor above $T_A = 25^\circ\text{C}$	$T_A \leq 25^\circ\text{C}$ power rating	$T_A = 70^\circ\text{C}$ power rating	$T_A = 85^\circ\text{C}$ power rating
Low K 4/	65.8°C/W	259°C/W	3.9 mW/°C	386 mW	212 mW	154 mW
High K 5/	65.8°C/W	180°C/W	5.6 mW/°C	555 mW	305 mW	222 mW

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- 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 network ground terminal.
- 3/ 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.
- 4/ The JEDEC Low K (1s) board design used to derive this data was a 3 inch x 3 inch, two layer board with 2 ounce copper traces on top of the board.
- 5/ The JEDEC High K (2s2p) board design used to derive this data was a 3 inch x 3 inch, multilayer board with 1 ounce internal power and ground planes and 2 ounce copper traces on top and bottom of the board.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07636</b>
		REV A	PAGE 3

2. APPLICABLE DOCUMENTS

JEDEC Solid State Technology Association

JEDEC PUB 95 – Registered and Standard Outlines for Semiconductor Devices

(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 22201-2107).

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.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07636</b>
		REV    A	PAGE    4

TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions 2/	Temperature, T <sub>J</sub>	Device type	Limits		Unit
					Min	Max	
Input voltage 3/	V <sub>IN</sub>		-55°C to +125°C	01	1.8	5.5	V
Continuous output current	I <sub>OUT</sub>		-55°C to +125°C	01	0	150	mA
Operating junction temperature	T <sub>J</sub>			01	-55	+125	°C
Output voltage	V <sub>OUT</sub>	1 mA < I <sub>OUT</sub> < 150 mA, 2.8 ≤ V <sub>IN</sub> ≤ 5.5 V	+25°C	01	1.8 typical		V
			-55°C to +125°C		1.728	1.872	
Quiescent current (GND current)	I <sub>(Q)</sub>	I <sub>OUT</sub> = 1 mA	+25°C	01	85 typical		μA
			-55°C to +125°C			125	
		I <sub>OUT</sub> = 150 mA	+25°C		570 typical		
			-55°C to +125°C			850	
Standby current		EN < 0.5 V	+25°C	01	0.01 typical		μA
			-55°C to +125°C			3	
Reference voltage	V <sub>REF</sub>		+25°C	01	1.225 typical		V
Ripple rejection	PSRR	f = 100 Hz, C <sub>O</sub> = 10 μF, 3/ I <sub>OUT</sub> = 150 mA	+25°C	01	48 typical		dB
Current limit		4/	-55°C to +125°C	01	120	525	mA
Output voltage line regulation (ΔV <sub>OUT</sub> / V <sub>OUT</sub> )		V <sub>O</sub> + 1 V < V <sub>IN</sub> ≤ 5.5 V, I <sub>OUT</sub> = 150 mA	+25°C	01		0.20	% / V
			-55°C to +125°C			0.35	
Output voltage load regulation		0 < I <sub>OUT</sub> < 150 mA	+25°C	01	1.5 typical		mV
EN high level input voltage	V <sub>IH</sub>		-55°C to +125°C	01	1.4		V
EN low level input voltage	V <sub>IL</sub>		-55°C to +125°C	01		0.4	V

See footnotes at end of table.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07636</b>
		<b>REV A</b>	<b>PAGE 5</b>

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions <u>2/</u>	Temperature, T <sub>J</sub>	Device type	Limits		Unit
					Min	Max	
EN input current	I <sub>I</sub>	EN = 0 V	+25°C	01	-0.01 typical		μA
		EN = I <sub>N</sub>			-0.01 typical		
Dropout voltage <u>5/</u>	V <sub>DO</sub>	I <sub>OUT</sub> = 150 mA	+25°C	01	150 typical		mV
Thermal shutdown temperature				01	170 typical		°C
Thermal shutdown hysteresis				01	20 typical		°C

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/ Unless otherwise specified, V<sub>IN</sub> = V<sub>OUT(Nom)</sub> + 1 V, I<sub>OUT</sub> = 1 mA, EN = V<sub>IN</sub>, and C<sub>OUT</sub> = 1 μF.

3/ Minimum input (I<sub>N</sub>) operating voltage is 1.8 V or V<sub>OUT</sub> + V<sub>DO</sub>, whichever is greater.

4/ Test condition includes output voltage V<sub>O</sub> = 1 V and pulse duration = 10 ms.

5/ Dropout voltage is defined as the differential voltage between V<sub>O</sub> and V<sub>I</sub> when V<sub>O</sub> drops 100 mV below the value measured with V<sub>IN</sub> = V<sub>OUT</sub> + V<sub>DO</sub>.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07636</b>
		REV A	PAGE 6

Case X

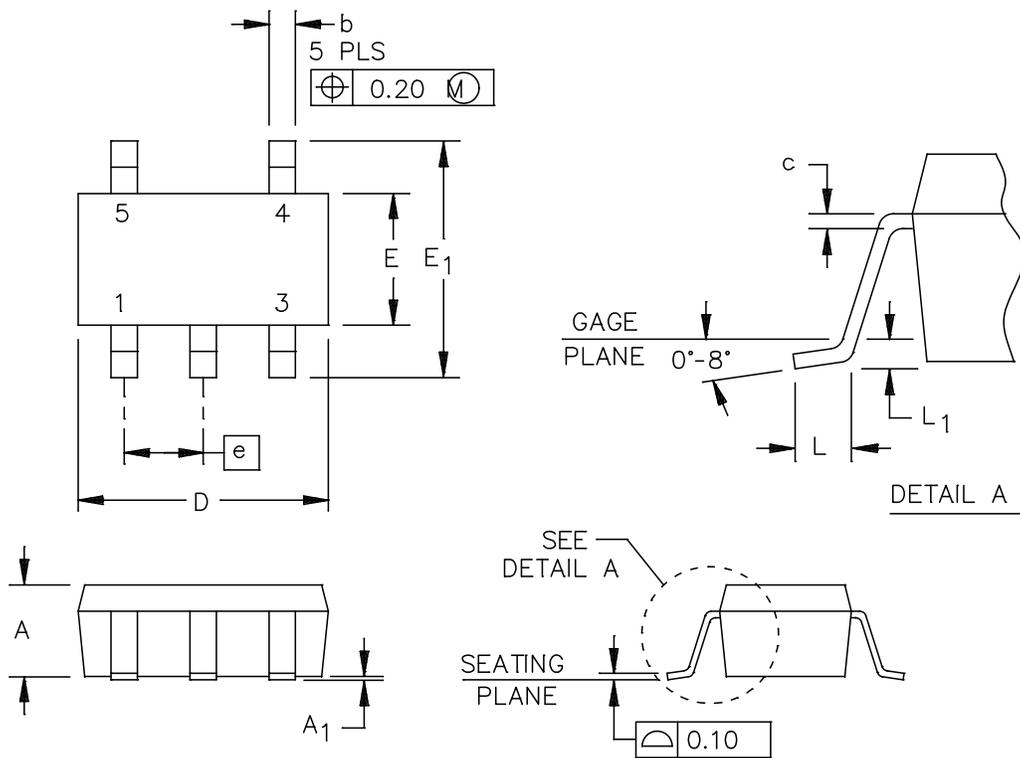


FIGURE 1. Case outline.

<p><b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b></p>	<p><b>SIZE A</b></p>	<p><b>CODE IDENT NO. 16236</b></p>	<p><b>DWG NO. V62/07636</b></p>
		<p>REV    A</p>	<p>PAGE    7</p>

Case X – continued.

Symbol	Dimensions			
	Inch		Millimeters	
	Min	Max	Min	Max
A	---	.057	---	1.45
A1	.000	.006	0.00	0.15
b	.011	.019	0.30	0.50
c	.003	.008	0.08	0.22
D	.108	.120	2.75	3.05
E	.057	.068	1.45	1.75
E1	.102	.118	2.60	3.00
e	.037 BSC		0.95 BSC	
L	.011	.022	0.30	0.55
L1	.009 BSC		0.25 BSC	
n	5 leads		5 leads	

NOTES:

1. Controlling dimensions are millimeter, inch dimensions are given for reference only.
2. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 mm (0.006 inch) per side.
3. Falls with JEDEC MO-178-AA.

FIGURE 1. Case outline - Continued.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07636</b>
		<b>REV     A</b>	<b>PAGE    8</b>

Device type	01	
Case outline	X	
Terminal number	Terminal symbol	Description
1	IN	Input supply voltage.
2	GND	Ground.
3	EN	Enable input.
4	NC	Not connected. This pin must be left floating and not connected to ground.
5	OUT	Regulated output voltage.

FIGURE 2. Terminal connections.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07636</b>
		REV    A	PAGE    9

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. DLA Land and Maritime maintains an online database of all current sources of supply at <http://www.landandmaritime.dla.mil/Programs/Smcr/>.

Vendor item drawing administrative control number <u>1/</u>	Device manufacturer CAGE code	Package <u>2/ 3/</u>	Symbol	Vendor part number
V62/07636-01XE	01295	DBV	CKZ	TPS72118MDBVREP

1/ The vendor item drawing establishes an administrative control number for identifying the item on the engineering documentation.

2/ Package drawings, thermal data, and symbolization are available from the manufacturer.

3/ The DBVR indicates tape and reel of 3000 parts.

CAGE code

01295

Source of supply

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

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07636</b>
		REV A	PAGE 10