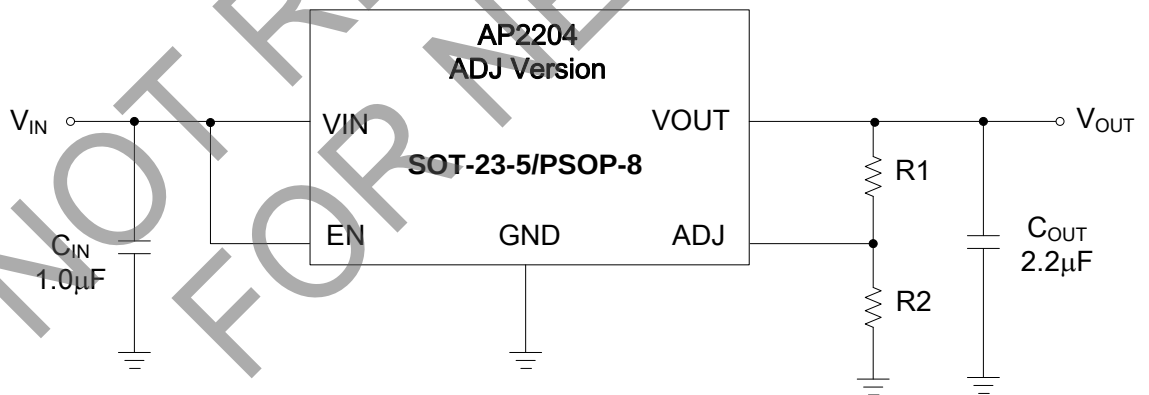
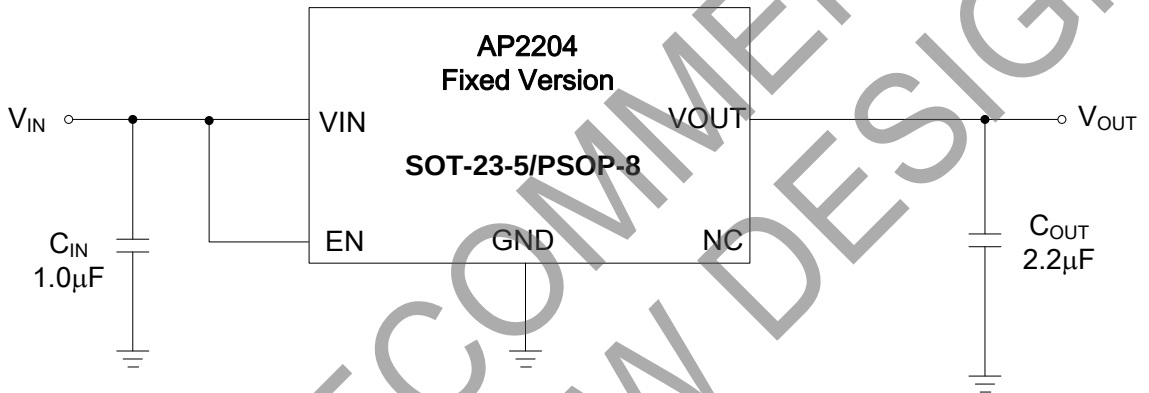
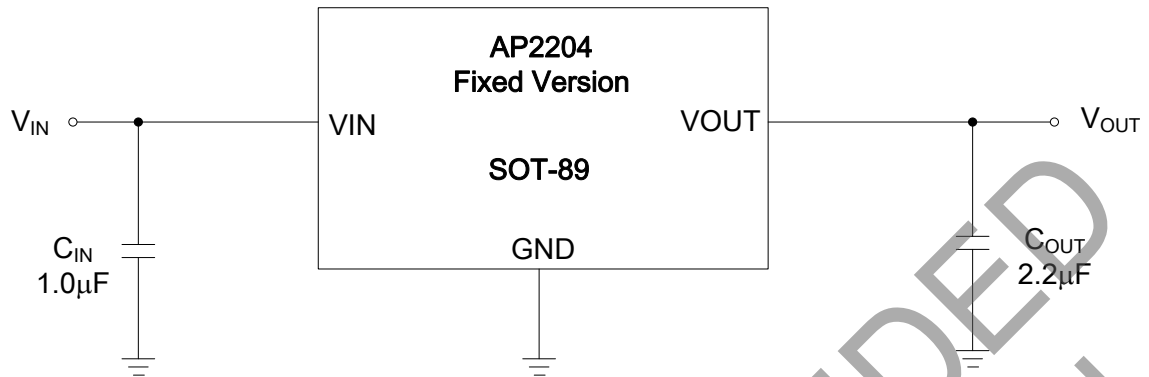


Typical Applications Circuit

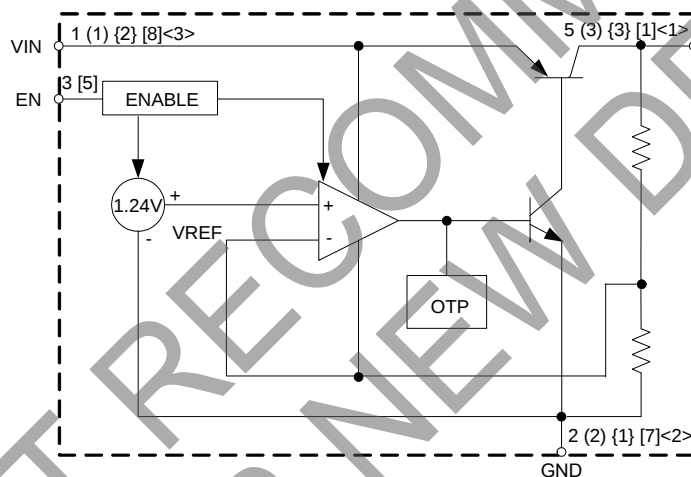


$$V_{OUT} = V_{REF}(1 + (R1/R2))$$

Pin Descriptions

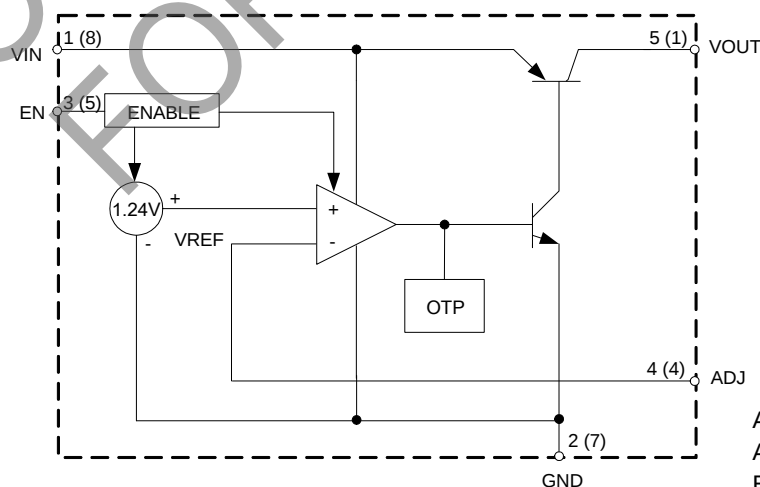
Pin Number					Pin Name	Function
SOT-23-5	PSOP-8	SOT-89				
		R	RA	RB		
1	8	1	2	3	VIN	Input voltage
2	7	2	1	2	GND	Ground
3	5	—	—	—	EN	Enable input
4	4	—	—	—	ADJ/NC	ADJ- Adjust output for ADJ version NC- Not connected for fixed version, Not Connected internally. Recommend connection to GND to maximize PCB copper for thermal dissipation.
5	1	3	3	1	VOUT	Regulated output voltage

Functional Block Diagram



Fixed Output Voltage

A (B) {C} [D] <E>
A for SOT-23-5
B for SOT-89 (R)
C for SOT-89 (RA)
D for PSOP-8
E for SOT-89 (RB)



Adjustable Output Voltage

A (B)
A for SOT-23-5
B for PSOP-8

Absolute Maximum Ratings (Note 7)

Symbol	Parameter	Rating		Unit
V_{IN}	Supply Input Voltage	38		V
V_{CE}	Enable Input Voltage	38		V
I_{OUT}	Output Current	250		mA
T_{LEAD}	Lead Temperature (Soldering, 10sec)	+260		°C
T_J	Operating Junction Temperature	+150		°C
θ_{JA}	Thermal Resistance	SOT-23-5	250	°C/W
		SOT-89	165	
		PSOP-8 (Note 8)	51	
T_{STG}	Storage Temperature Range	-65 to +150		°C
—	ESD (Machine Model)	275		V
—	ESD (Human Body Model)	2000		V

Notes: 7. Stresses greater than those listed under "Absolute Maximum Ratings" can 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 Ratings" for extended periods can affect device reliability.

8. θ_{JA} is measured with the component mounted on a 2-Layer FR-4 PCB board with 1.5cm*1.5cm thermal sink pad in free air.

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{IN}	Supply Input Voltage	2.6 (Note 9)	24	V
T_J	Operating Junction Temperature	-40	+125	°C

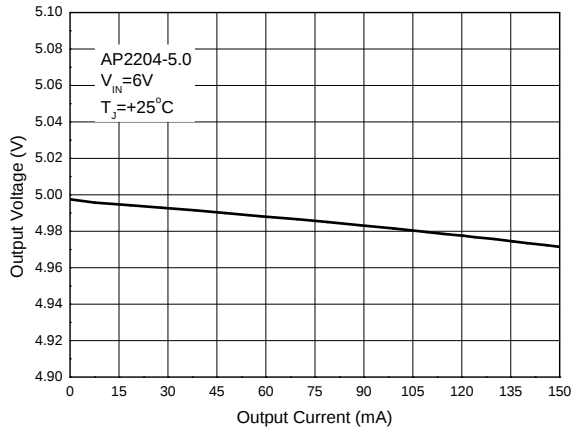
Note: 9. Minimum recommended input voltage is the larger of 2.6V or $V_{OUT} + 1V$. Below this value the device may enter drop-out conditions and cease to regulate the output voltage correctly.

Electrical Characteristics (@ $V_{IN} = V_{OUT} + 1V$, $T_J = +25^{\circ}C$, $I_{OUT} = 100\mu A$, $C_{IN} = 1.0\mu F$, $C_{OUT} = 2.2\mu F$, **Bold** typeface applies over $-40^{\circ}C \leq T_J \leq +125^{\circ}C$, unless otherwise specified.)

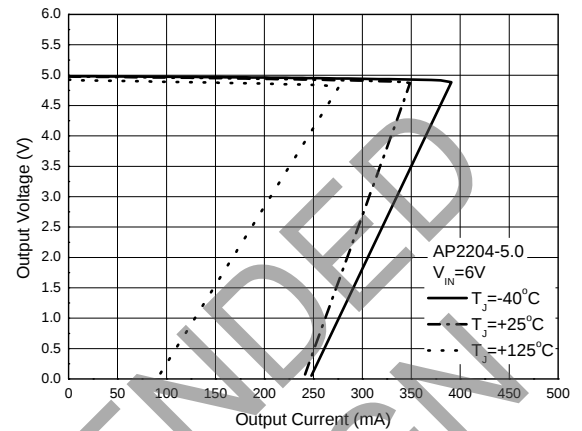
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	Variation from Specified V_{OUT}	$V_{OUT} \times 98\%$	—	$V_{OUT} \times 102\%$	V
V_{REF}	Reference Voltage	—	1.215	1.24	1.265	V
V_{IN}	Input Voltage	—	—	—	24	V
$I_{OUT(max)}$	Maximum Output Current	$V_{IN} - V_{OUT} = 1V$, $V_{OUT} = 98\% \times V_{OUT}$	150	200	—	mA
$\Delta V_{OUT}/\Delta V_{IN}$	Line Regulation	$V_{OUT} + 1V \leq V_{IN} \leq 24V$	—	0.05	—	%
$\Delta V_{OUT}/I_{OUT}$	Load Regulation	$1mA \leq I_{OUT} \leq 150mA$	—	0.5	—	%
V_{DROP}	Dropout Voltage	$I_{OUT} = 100\mu A$	—	100	150	mV
		$I_{OUT} = 50mA$	—	270	350	
		$I_{OUT} = 100mA$	—	320	460	
		$I_{OUT} = 150mA$	—	360	500	
I_{GND}	Ground Current	$I_{OUT} = 0A$	—	20	—	μA
		$I_{OUT} = 100\mu A$	—	50	—	
		$I_{OUT} = 50mA$	—	0.5	—	mA
		$I_{OUT} = 100mA$	—	1.3	—	
		$I_{OUT} = 150mA$	—	2.5	—	
I_{STD}	Standby Current	$V_{IN} = V_{OUT} + 1V$ V_{EN} in OFF Mode	—	0.01	1.0	μA
PSRR	Power Supply Rejection Ratio	Ripple 0.5V _{P-P} $V_{IN} = V_{OUT} + 1V$	$f = 100Hz$	—	60	dB
			$f = 1kHz$	—	60	
$\Delta V_{OUT}/(V_{OUT} \times \Delta T)$	Output Voltage Temperature Coefficient	$I_{OUT} = 100\mu A$, $-40^{\circ}C \leq T_J \leq +125^{\circ}C$	—	± 100	—	ppm/ $^{\circ}C$
V_{NOI}	RMS Output Noise	$T_J = +25^{\circ}C$, $10Hz \leq f \leq 100kHz$	—	30	—	μV_{rms}
I_{ADJ}	ADJ Pin Current	$I_{OUT} = 100\mu A$	—	0.5	—	μA
I_{EN}	EN Pin Current	$V_{EN} = V_{OUT} + 1V$	—	1	—	μA
—	EN "High" Voltage	EN Input Voltage "High"	2.0	—	—	V
—	EN "Low" Voltage	EN Input Voltage "Low"	—	—	0.4	V
θ_{JC}	Thermal Resistance (Junction to Case)	SOT-23-5	—	43	—	$^{\circ}C/W$
		SOT-89	—	27	—	
		PSOP-8	—	22	—	

Performance Characteristics

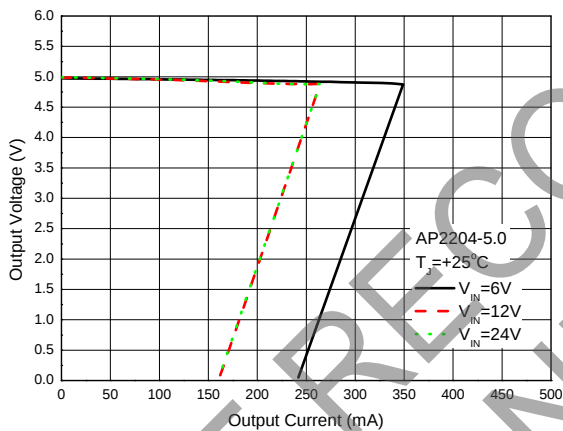
Output Voltage vs. Output Current



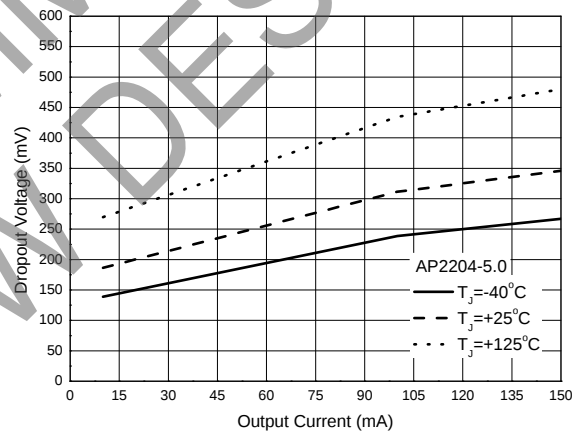
Output Voltage vs. Output Current



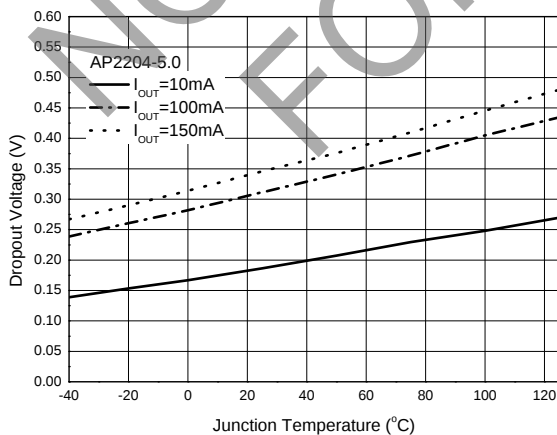
Output Voltage vs. Output Current



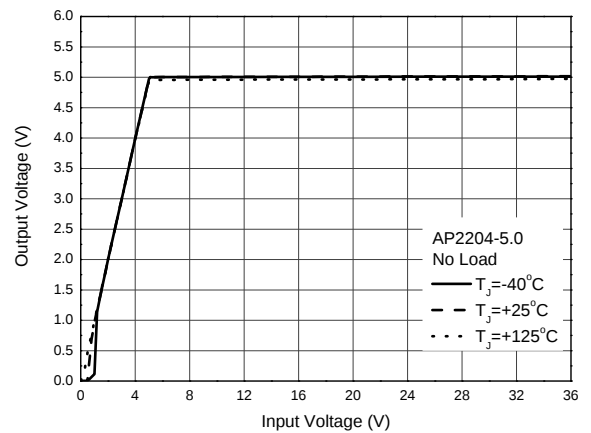
Dropout Voltage vs. Output Current



Dropout Voltage vs. Junction Temperature

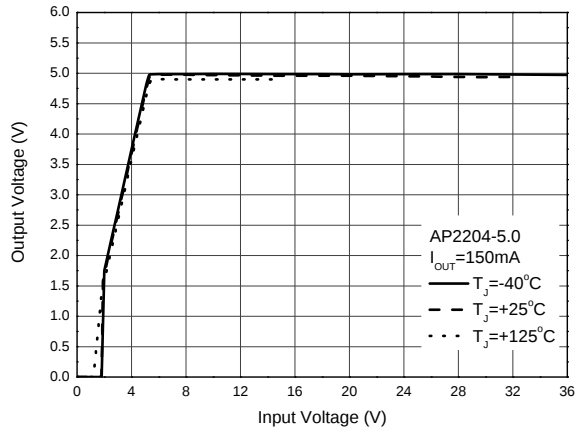


Output Voltage vs. Input Voltage

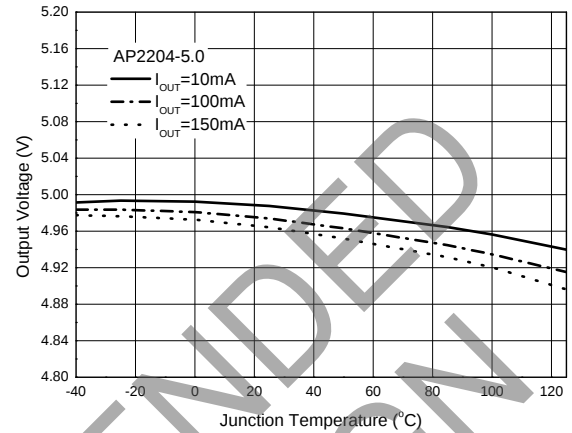


Performance Characteristics (continued)

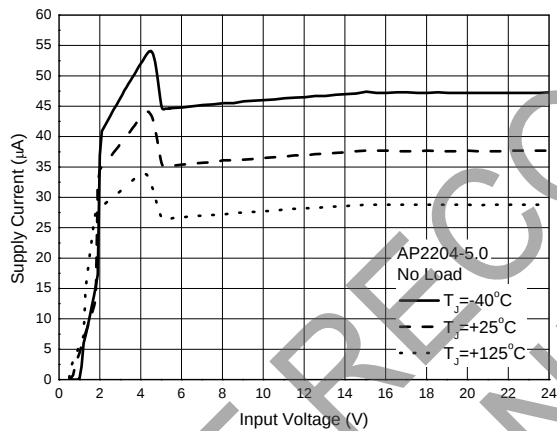
Output Voltage vs. Input Voltage



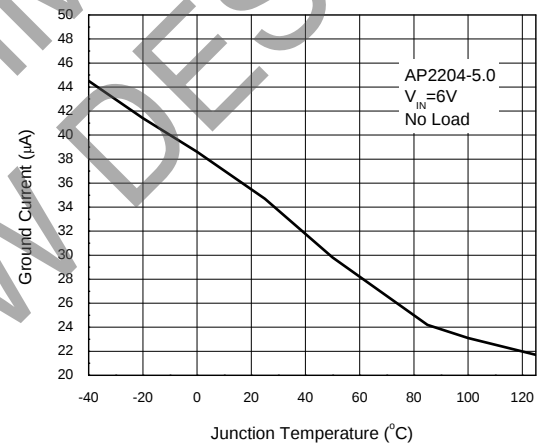
Output Voltage vs. Junction Temperature



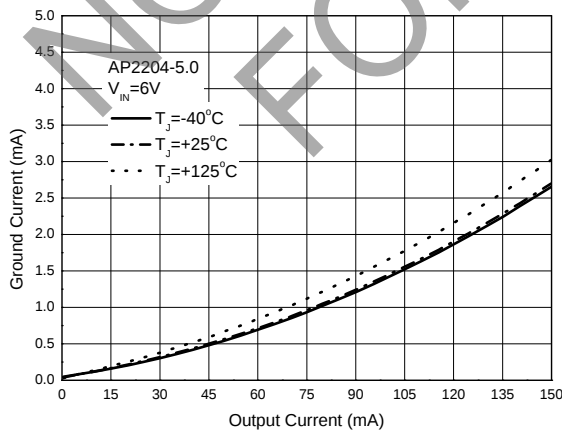
Supply Current vs. Input Voltage



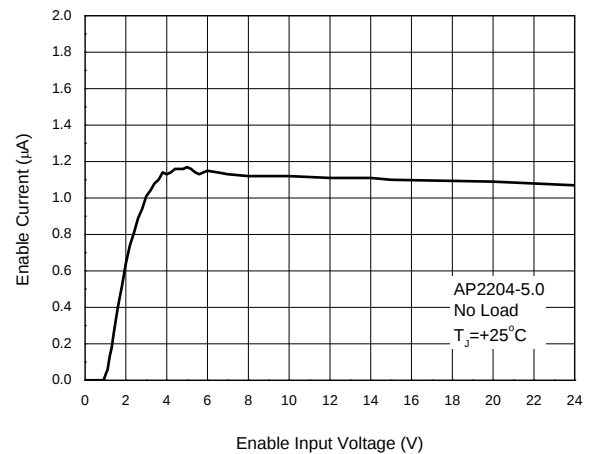
Ground Current vs. Junction Temperature



Ground Current vs. Output Current



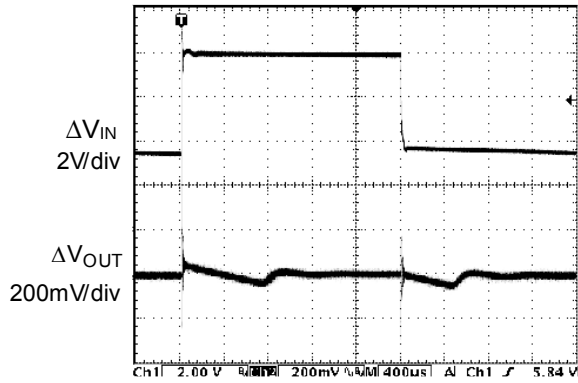
Enable Current vs. Enable Input Voltage



Performance Characteristics (continued)

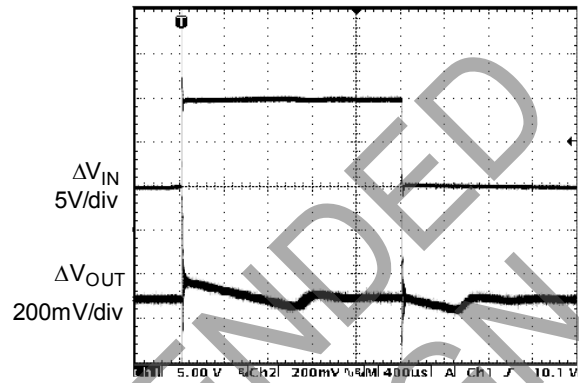
Line Transient

(Conditions: $V_{IN}=V_{EN}=3.5V$ to $8V$, $C_{IN}=1.0\mu F$,
 $C_{OUT}=2.2\mu F$, $I_{OUT}=1mA$)



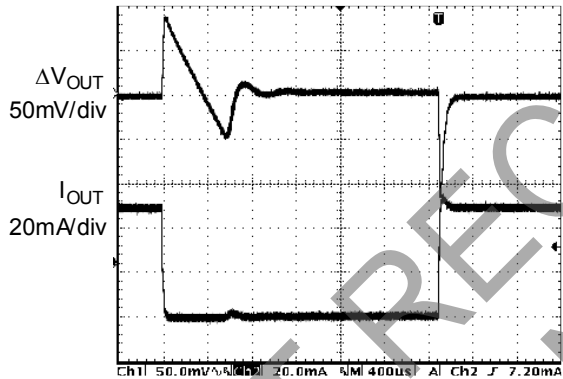
Line Transient

(Conditions: $V_{IN}=V_{EN}=5V$ to $15V$, $C_{IN}=1.0\mu F$,
 $C_{OUT}=2.2\mu F$, $I_{OUT}=1mA$)



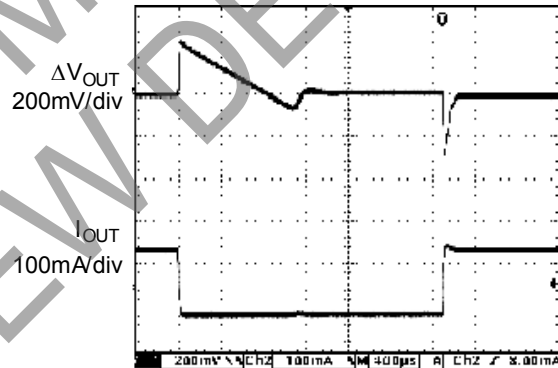
Load Transient

(Conditions: $V_{IN}=5V$, $C_{IN}=1.0\mu F$, $C_{OUT}=2.2\mu F$,
 $I_{OUT}=1mA$ to $50mA$)

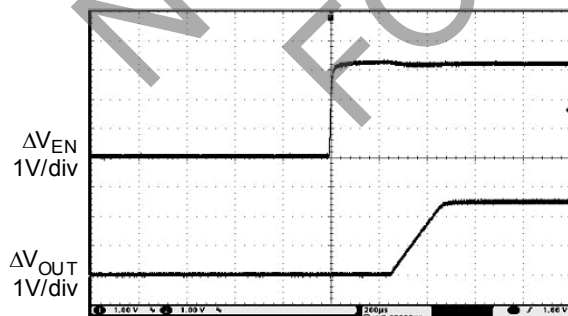


Load Transient

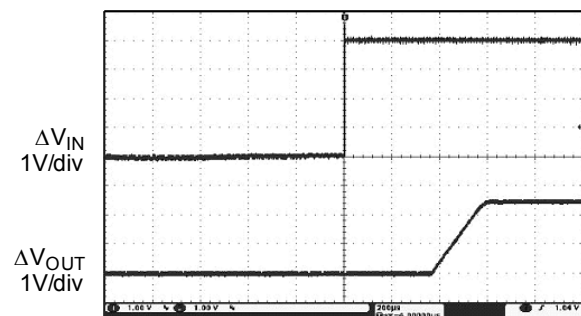
(Conditions: $V_{IN}=5V$, $C_{IN}=1.0\mu F$, $C_{OUT}=2.2\mu F$,
 $I_{OUT}=1mA$ to $150mA$)



Enable Input Response

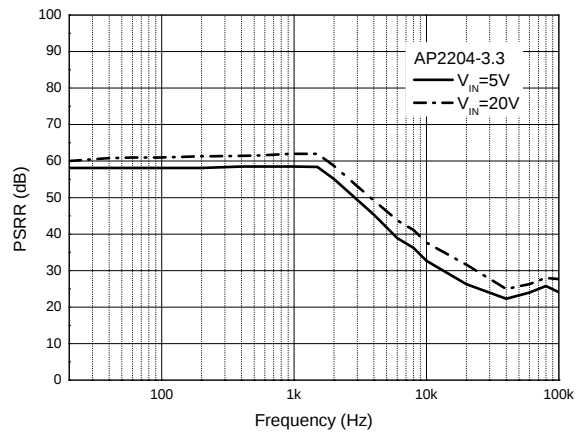


Start-up Response

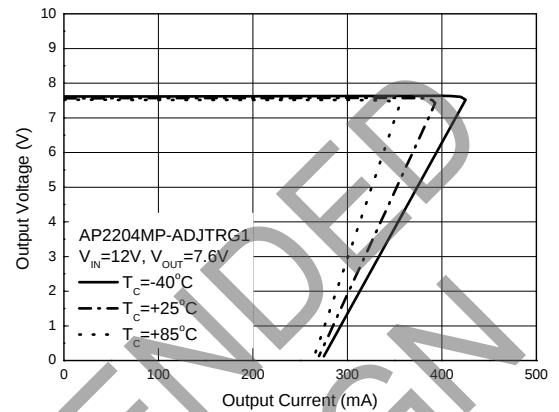


Performance Characteristics (continued)

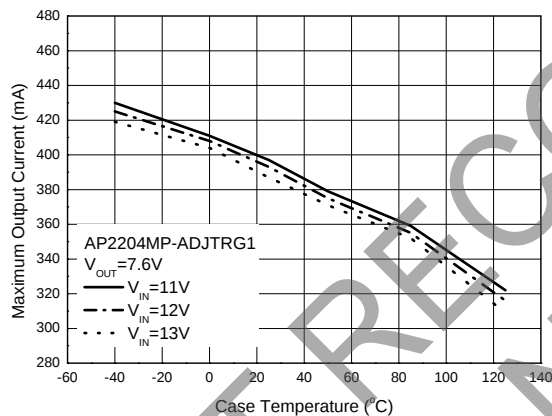
PSRR vs. Frequency
(Conditions: $V_{PP}=2V$, $I_{OUT}=10mA$)



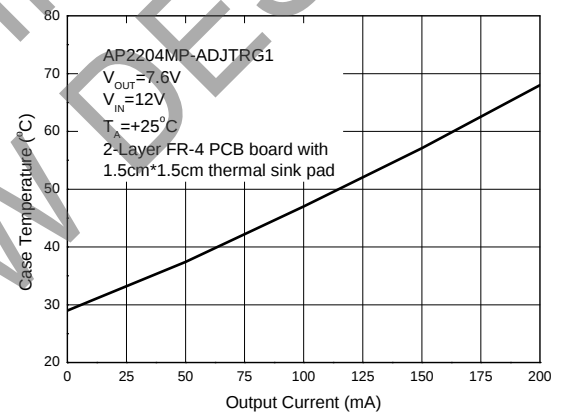
Output Voltage vs. Output Current



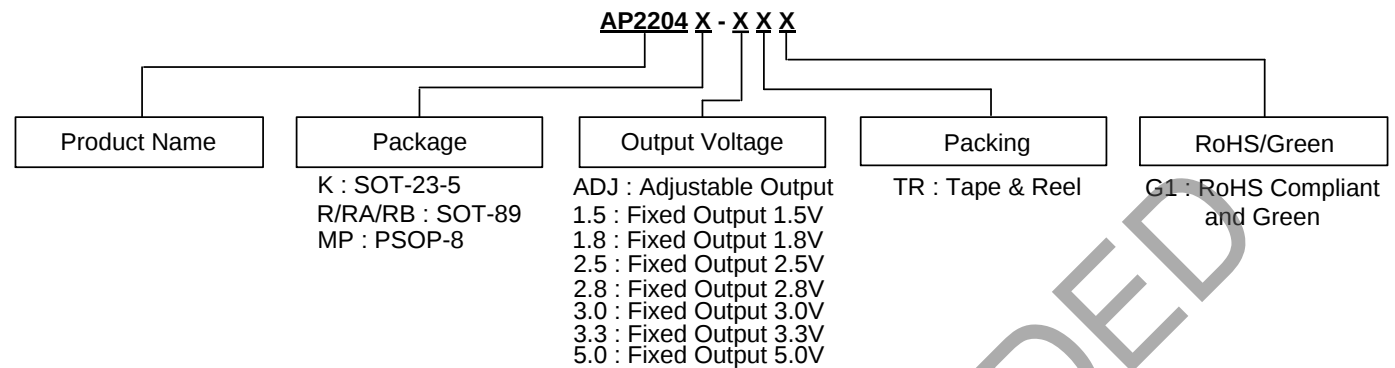
Maximum Output Current vs. Case Temperature



Case Temperature vs. Output Current



Ordering Information

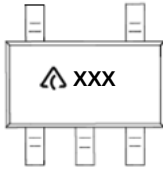


Package	Temperature Range	Output Voltage	Part Number	Marking ID	Packing
SOT-23-5	-40 to +85°C	ADJ	AP2204K-ADJTRG1	GAF	3000/7" Tape & Reel
		1.5V	AP2204K-1.5TRG1	GBH	3000/7" Tape & Reel
		1.8V	AP2204K-1.8TRG1	GAG	3000/7" Tape & Reel
		2.5V	AP2204K-2.5TRG1	GAD	3000/7" Tape & Reel
		2.8V	AP2204K-2.8TRG1	GAE	3000/7" Tape & Reel
		3.0V	AP2204K-3.0TRG1	GEF	3000/7" Tape & Reel
		3.3V	AP2204K-3.3TRG1	GAH	3000/7" Tape & Reel
		5.0V	AP2204K-5.0TRG1	GAI	3000/7" Tape & Reel
SOT-89	-40 to +85°C	1.5V (R)	AP2204R-1.5TRG1	G22C	1000/7" Tape & Reel
		1.8V (R)	AP2204R-1.8TRG1	G31C	1000/7" Tape & Reel
		2.5V (R)	AP2204R-2.5TRG1	G22D	1000/7" Tape & Reel
		2.8V (R)	AP2204R-2.8TRG1	G22E	1000/7" Tape & Reel
		3.0V (R)	AP2204R-3.0TRG1	G22F	1000/7" Tape & Reel
		3.3V (R)	AP2204R-3.3TRG1	G31D	1000/7" Tape & Reel
		5.0V (R)	AP2204R-5.0TRG1	G31E	1000/7" Tape & Reel
SOT-89	-40 to +85°C	3.3V (RA)	AP2204RA-3.3TRG1	G37O	1000/7" Tape & Reel
		5.0V (RA)	AP2204RA-5.0TRG1	G41O	1000/7" Tape & Reel
SOT-89	-40 to +85°C	3.3V (RB)	AP2204RB-3.3TRG1	G37R	1000/7" Tape & Reel
		5.0V (RB)	AP2204RB-5.0TRG1	G41R	1000/7" Tape & Reel
PSOP-8	-40 to +85°C	ADJ	AP2204MP-ADJTRG1	2204MP-ADJG1	4000/13" Tape & Reel

Marking Information

(1) SOT-23-5

(Top View)

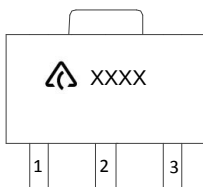


: Logo

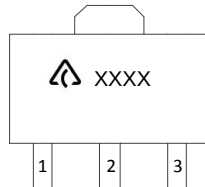
XXX: Marking ID (See Ordering Information)

(2) SOT-89

(Top View)



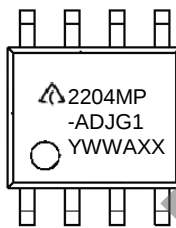
(Top View)



First Line: Logo and Marking ID
(See Ordering Information)

(3) PSOP-8

(Top View)



First and Second Lines: Logo and Marking ID
(See Ordering Information)

Third Line: Date Code

Y: Year

WW: Work Week of Molding

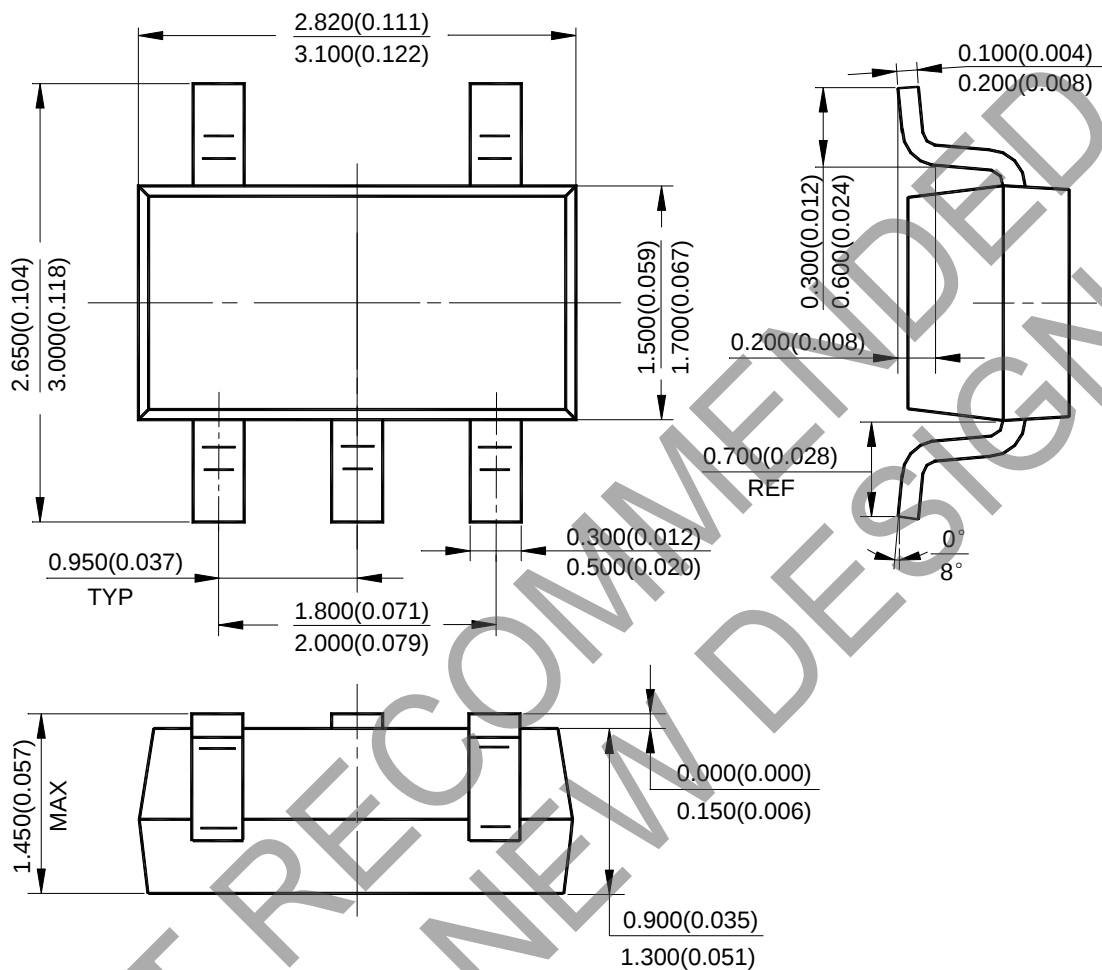
A: Assembly House Code

XX: 7th and 8th Digits of Batch Number

Package Outline Dimensions (All dimensions in mm(inch).)

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(1) Package Type: SOT-23-5



Please see <http://www.diodes.com/package-outlines.html> for the latest version.

Technical drawing of a mechanical part, showing three views: front, side, and two alternative top views (Option 1 and Option 2). The drawing includes dimensions in millimeters and inches, and a large diagonal watermark reading "NOT FOR COMMERCIAL DESIGN".

Front View:

- Overall width: 4.400 (0.173)
- Inner width: 4.600 (0.181)
- Option 1 label
- Top flange height: 2.300 (0.091)
- Bottom flange height: 2.600 (0.102)
- Left side height: 3.950 (0.156)
- Right side height: 4.250 (0.167)
- Bottom flange thickness: 0.900 (0.035)
- Bottom flange width: 1.200 (0.047)
- Bottom flange width (inner): 0.320 (0.013)
- Bottom flange width (outer): 0.540 (0.021)
- Bottom flange width (inner): 0.320 (0.013)
- Bottom flange width (outer): 0.540 (0.021)
- Bottom flange width (inner): 0.480 (0.019)
- Bottom flange width (outer): 0.620 (0.024)
- Bottom flange width (inner): 3.000 (0.118) TYP

Side View:

- Top flange width: 1.400 (0.055)
- Top flange width (inner): 1.600 (0.063)
- Top flange height: 2.060 (0.081) REF
- Top flange angle: 3°
- Top flange angle: 10°
- Top flange width (inner): 0.350 (0.014)
- Top flange width (outer): 0.450 (0.018)

Option 1 (Top View):

- Option 1 label
- Top flange width: 1.550 (0.061) REF
- Top flange width (inner): 1.030 (0.041) REF
- Top flange angle: 45°
- Top flange width (inner): 0.320 (0.013) REF
- Top flange width (outer): 1.620 (0.064) REF
- Top flange width (inner): 2.210 (0.087) REF
- Top flange width (outer): 1.500 (0.059)
- Top flange width (outer): 1.800 (0.071)

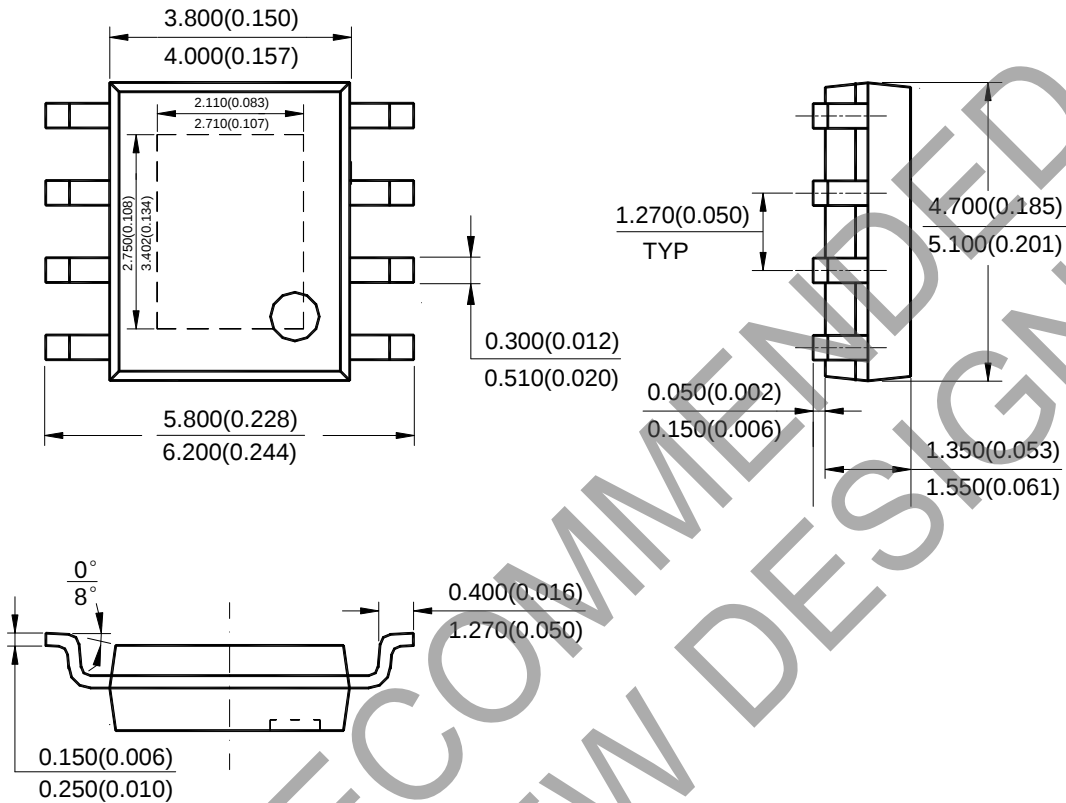
Option 2 (Top View):

- Option 2 label
- Top flange width: R 0.200 (0.008)
- Top flange width (inner): 2.630 (0.104)
- Top flange width (outer): 2.930 (0.115)
- Top flange width (inner): 1.620 (0.064)
- Top flange width (outer): 1.830 (0.072)

Package Outline Dimensions (All dimensions in mm(inch).) (continued)

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(3) Package Type: PSOP-8

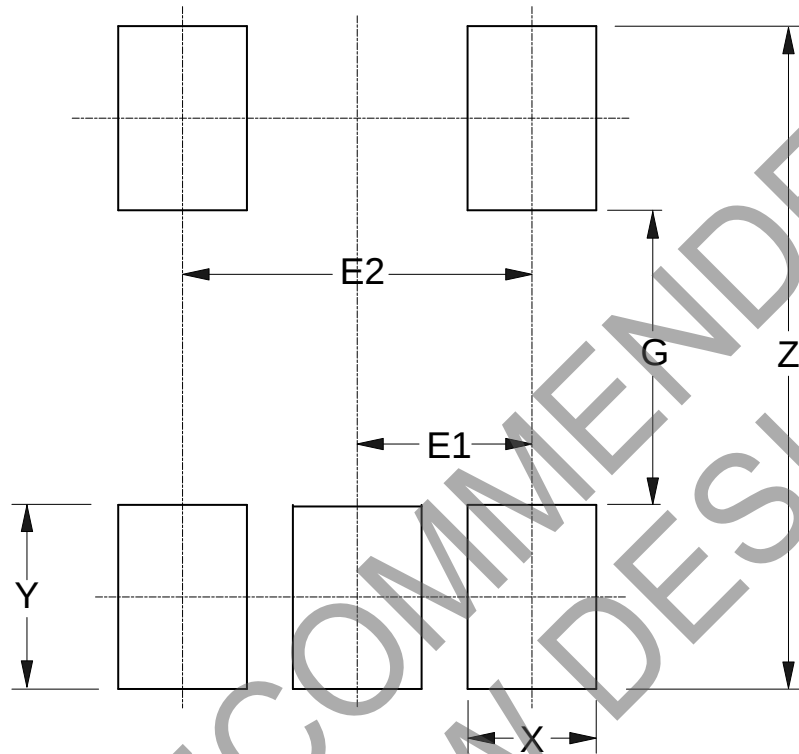


Note: Eject hole, oriented hole and mold mark is optional.

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(1) Package Type: SOT-23-5

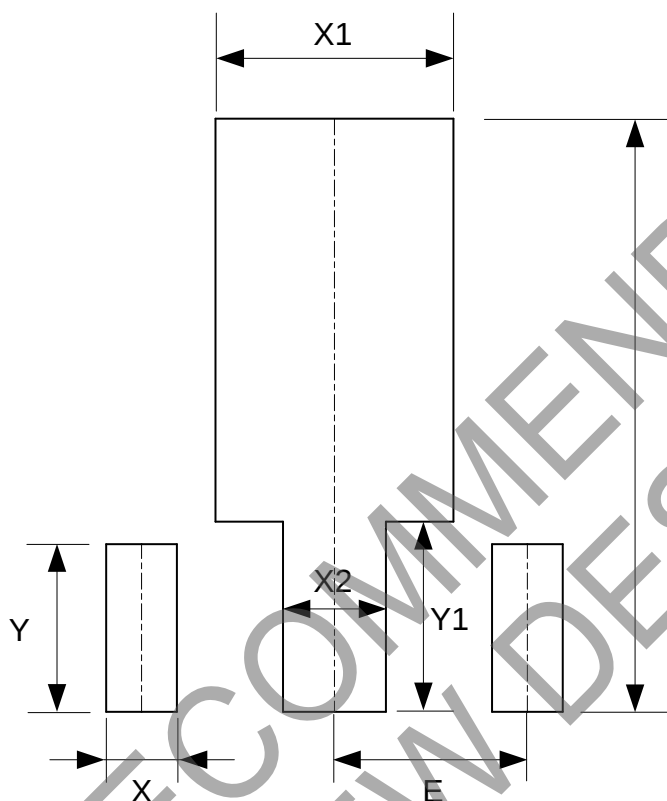


Dimensions	Z (mm)/(inch)	G (mm)/(inch)	X (mm)/(inch)	Y (mm)/(inch)	E1 (mm)/(inch)	E2 (mm)/(inch)
Value	3.600/0.142	1.600/0.063	0.700/0.028	1.000/0.039	0.950/0.037	1.900/0.075

Suggested Pad Layout (continued)

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(2) Package Type: SOT-89

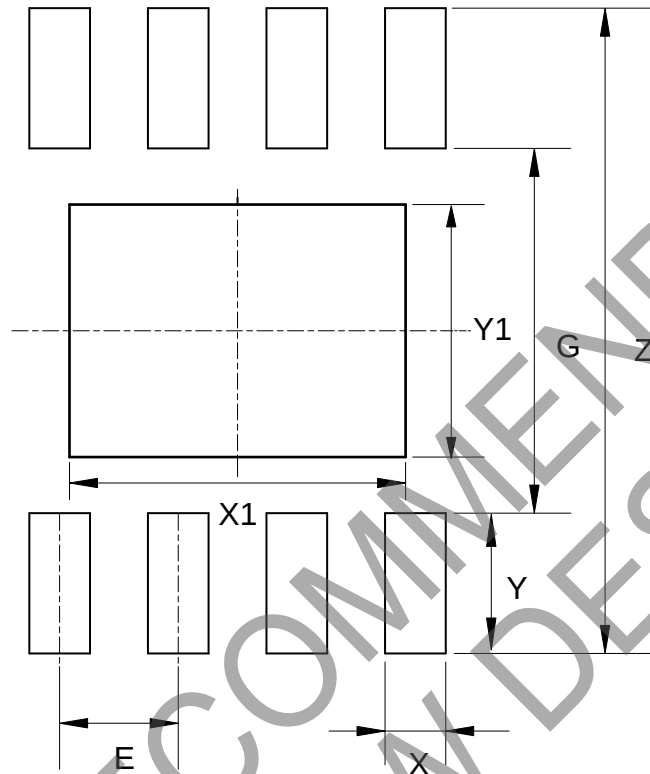


Dimensions	Z (mm)/(inch)	X (mm)/(inch)	X1 (mm)/(inch)	X2 (mm)/(inch)	Y (mm)/(inch)	Y1 (mm)/(inch)	E (mm)/(inch)
Value	4.600/0.181	0.550/0.022	1.850/0.073	0.800/0.031	1.300/0.051	1.475/0.058	1.500/0.059

Suggested Pad Layout (continued)

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(3) Package Type: PSOP-8



Dimensions	Z (mm)/(inch)	G (mm)/(inch)	X (mm)/(inch)	Y (mm)/(inch)	X1 (mm)/(inch)	Y1 (mm)/(inch)	E (mm)/(inch)
Value	6.900/0.272	3.900/0.154	0.650/0.026	1.500/0.059	3.600/0.142	2.700/0.106	1.270/0.050

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1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

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