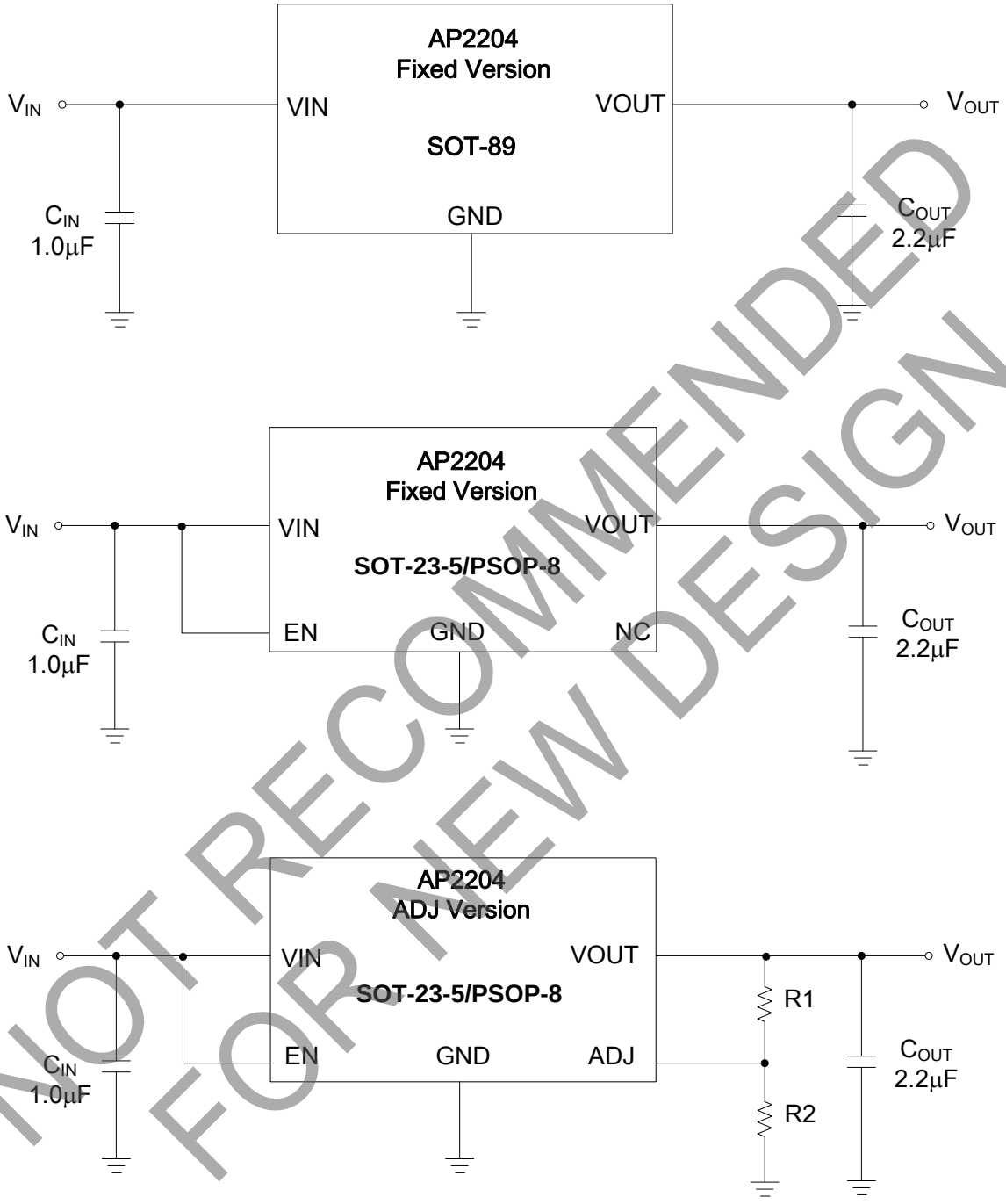
Typical Applications Circuit

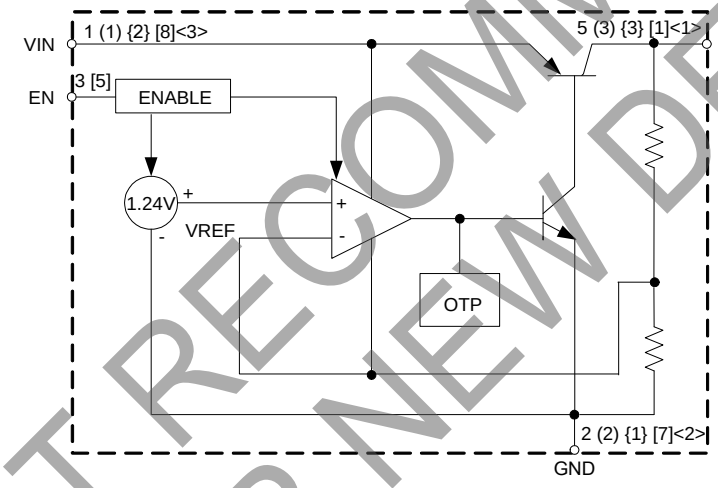


$V_{OUT}=V_{REF}(1+(R1/R2))$

Pin Descriptions

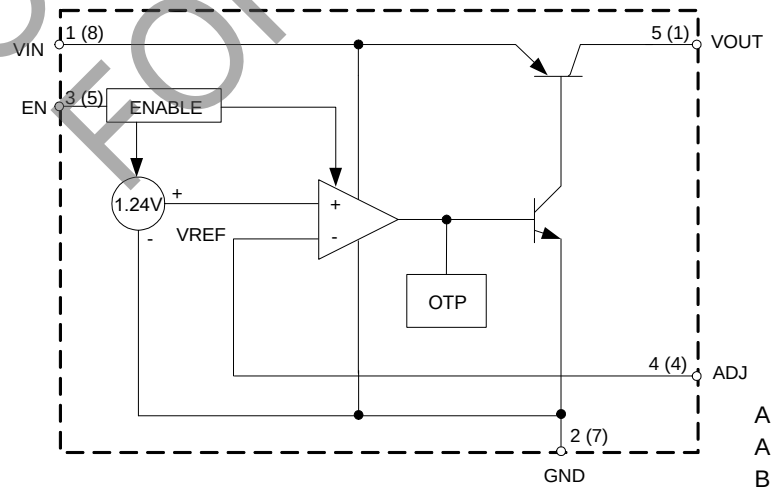
Pin Number					Pin Name	Function
SOT-23-5	PSOP-8	SOT-89				
		R	RA	RB		
1	8	1	2	3	VIN	Input voltage
2	7	2	1	2	GND	Ground
3	5	—	—	—	EN	Enable input
4	4	—	—	—	ADJ/NC	ADJ- Adjust output for ADJ version NC- Not connected for fixed version, Not Connected internally. Recommend connection to GND to maximize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

Functional Block Diagram



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)

Fixed Output Voltage



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

Adjustable Output Voltage

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

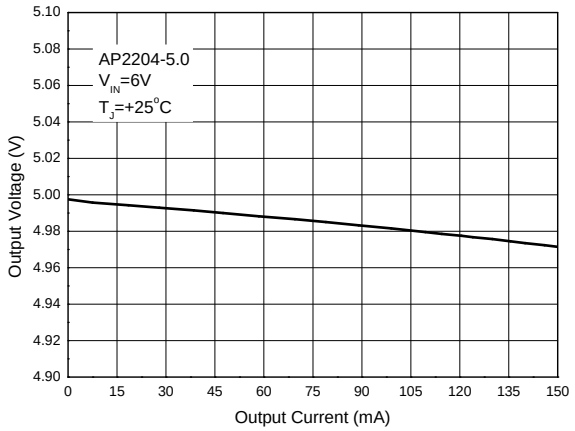
Note: 9. Minimum recommended input voltage is the larger of 2.6V or V_{OUT} + 1V. Below this value the device may enter drop-out conditions and cease to regulate the output voltage correctly.

Electrical Characteristics (@V_{IN} = V_{OUT}+1V, T_J = +25°C, I_{OUT} = 100μA, C_{IN} = 1.0μF, C_{OUT} = 2.2μF, **Bold** typeface applies over -40°C ≤ T_J ≤ +125°C, unless otherwise specified.)

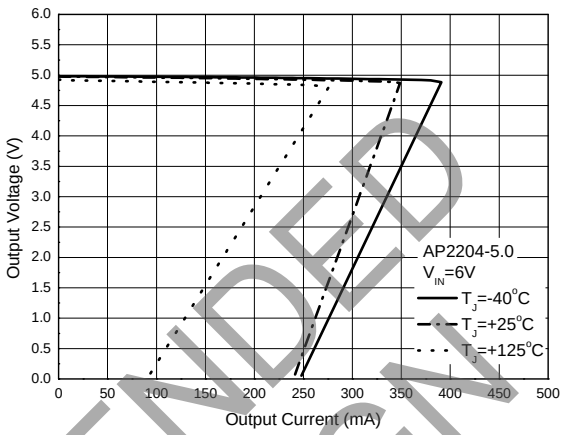
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	Variation from Specified V_{OUT}	V_{OUT} ×98%	—	V_{OUT} ×102%	V
V_{REF}	Reference Voltage	—	1.215	1.24	1.265	V
V_{IN}	Input Voltage	—	—	—	24	V
$I_{OUT(max)}$	Maximum Output Current	V_{IN}-V_{OUT} = 1V, V_{OUT} = 98% × V_{OUT}	150	200	—	mA
$\Delta V_{OUT}/\Delta V_{IN}$	Line Regulation	V_{OUT}+1V ≤ V_{IN} ≤ 24V	—	0.05	—	%
$\Delta V_{OUT}/V_{OUT}$	Load Regulation	1mA ≤ I_{OUT} ≤ 150mA	—	0.5	—	%
V_{DROP}	Dropout Voltage	I_{OUT} = 100μA	—	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} = 100μA	—	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 Ration	Ripple 0.5V_{P-P}, V_{IN} = V_{OUT}+1V, f = 100Hz	—	60	—	dB
		Ripple 0.5V_{P-P}, V_{IN} = V_{OUT}+1V, f = 1kHz	—	60	—	
$\Delta V_{OUT}/(V_{OUT}\times\Delta T)$	Output Voltage Temperature Coefficient	I_{OUT} = 100μA, -40 °C ≤ T_J ≤ +125°C	—	**±100**	—	ppm/°C
V_{NOI}	RMS Output Noise	T_J = +25°C, 10Hz ≤ f ≤ 100kHz	—	30	—	μV_{rms}
I_{ADJ}	ADJ Pin Current	I_{OUT} = 100μA	—	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	—	°C/W
		SOT-89	—	27	—	
		PSOP-8	—	22	—	

Performance Characteristics

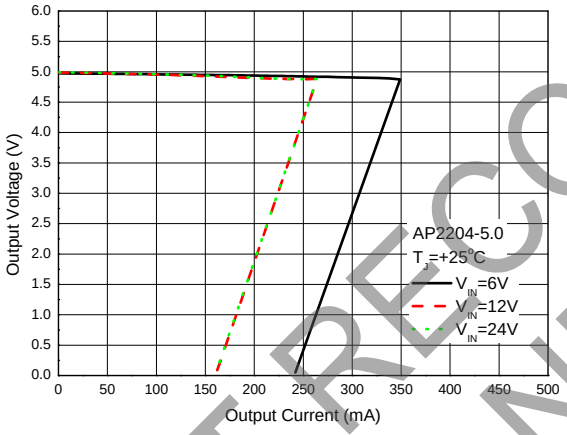
Output Voltage vs. Output Current



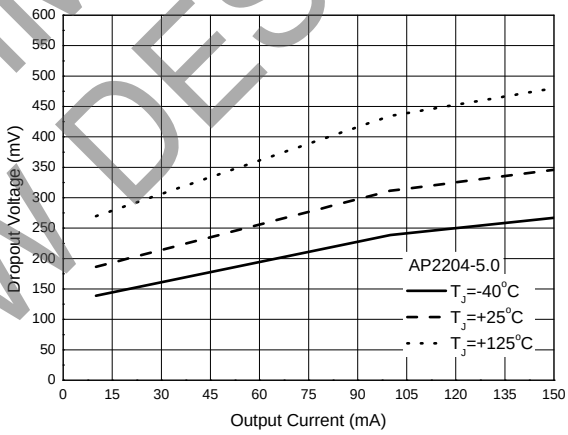
Output Voltage vs. Output Current



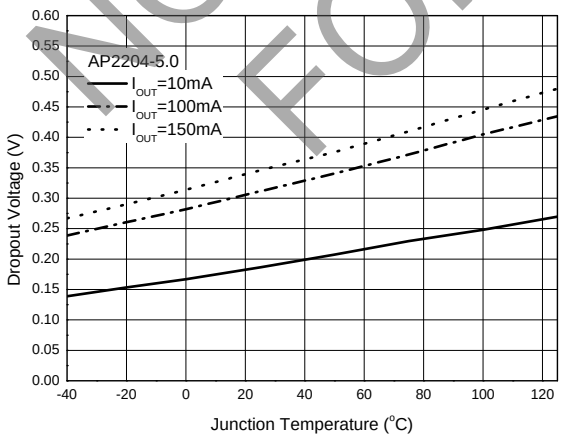
Output Voltage vs. Output Current



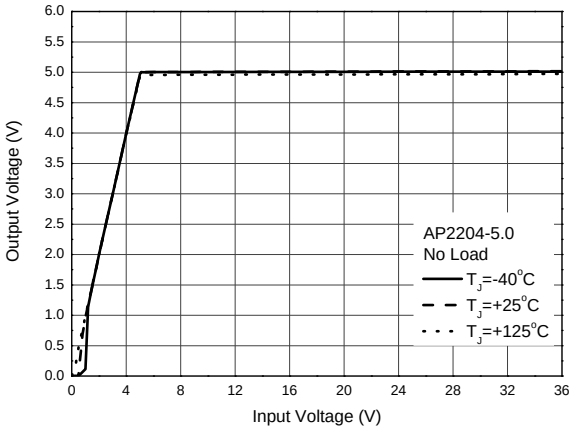
Dropout Voltage vs. Output Current



Dropout Voltage vs. Junction Temperature

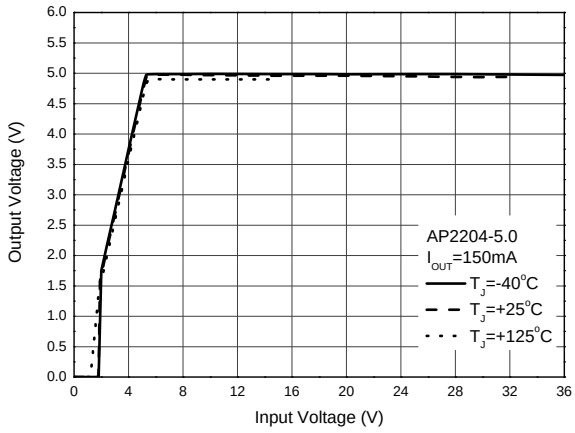


Output Voltage vs. Input Voltage

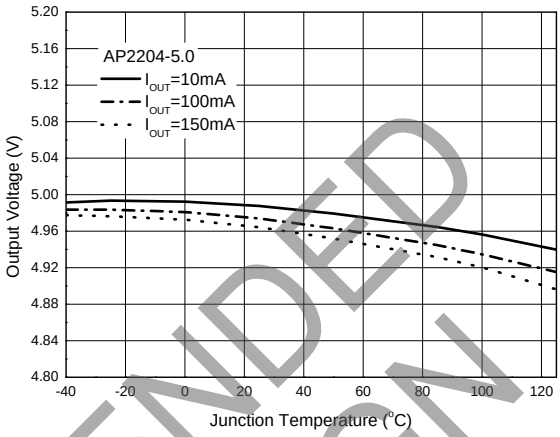


Performance Characteristics (continued)

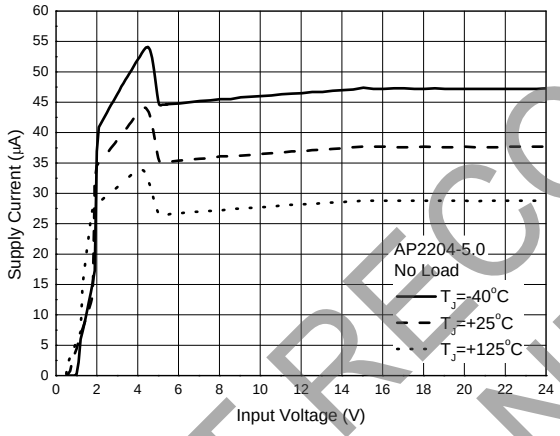
Output Voltage vs. Input Voltage



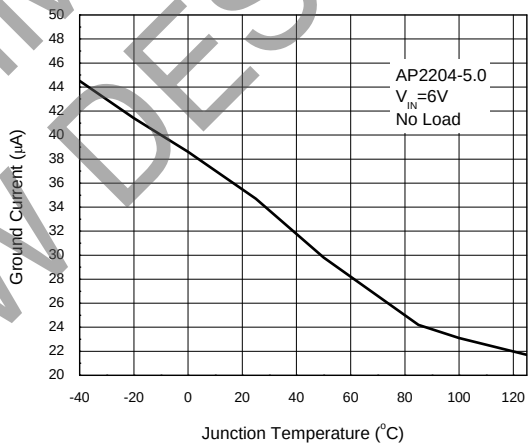
Output Voltage vs. Junction Temperature



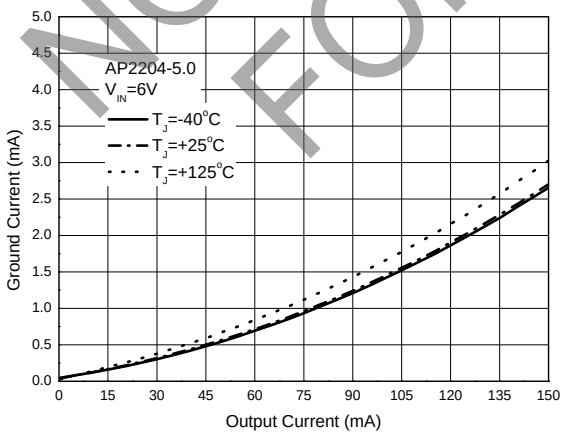
Supply Current vs. Input Voltage



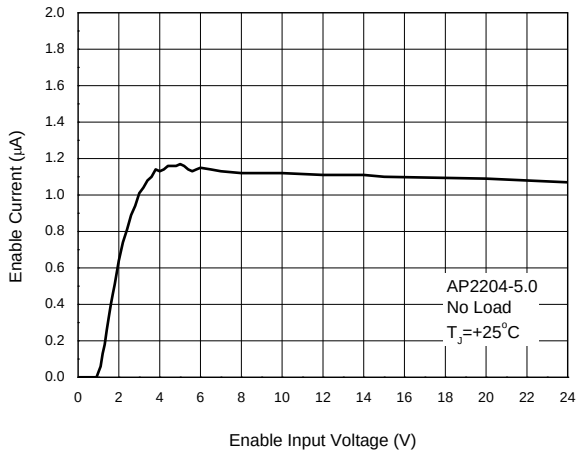
Ground Current vs. Junction Temperature



Ground Current vs. Output Current

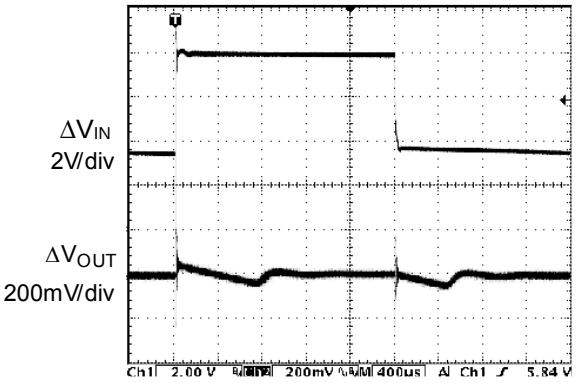


Enable Current vs. Enable Input Voltage

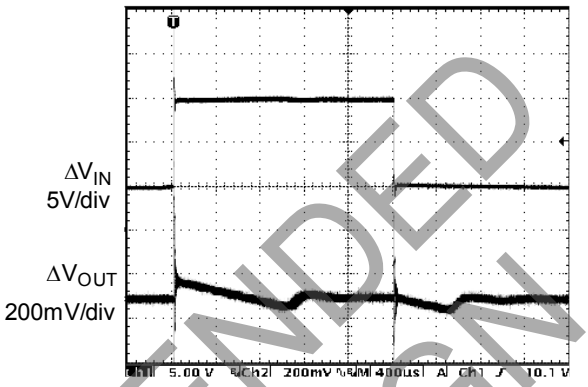


Performance Characteristics (continued)

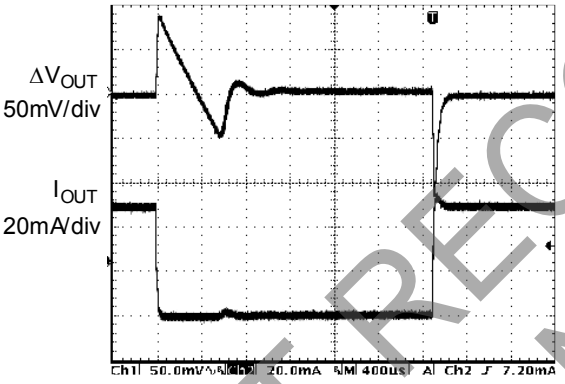
Line Transient
(Conditions: V_{IN}=V_{EN}=3.5V to 8V, C_{IN}=1.0μF, C_{OUT}=2.2μF, I_{OUT}=1mA)



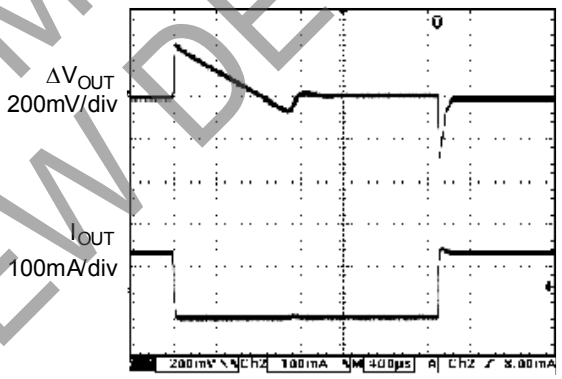
Line Transient
(Conditions: V_{IN}=V_{EN}=5V to 15V, C_{IN}=1.0μF, C_{OUT}=2.2μF, I_{OUT}=1mA)



Load Transient
(Conditions: V_{IN}=5V, C_{IN}=1.0μF, C_{OUT}=2.2μF, I_{OUT}=1mA to 50mA)

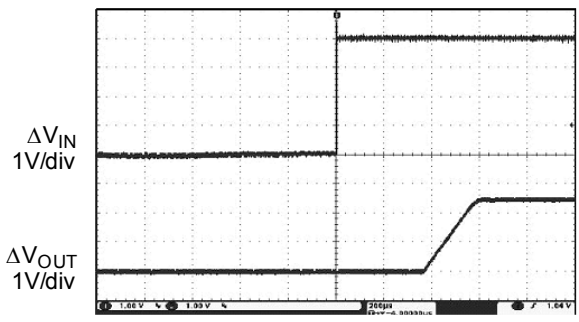


Load Transient
(Conditions: V_{IN}=5V, C_{IN}=1.0μF, C_{OUT}=2.2μF, I_{OUT}=1mA to 150mA)



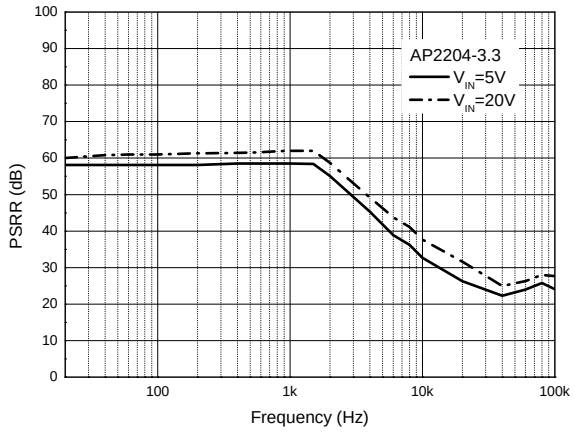
Enable Input Response

Start-up Response

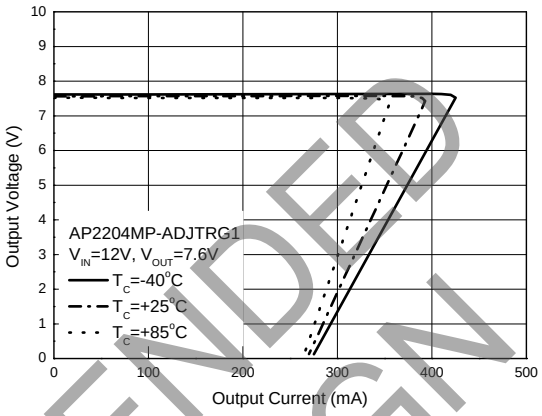


Performance Characteristics (continued)

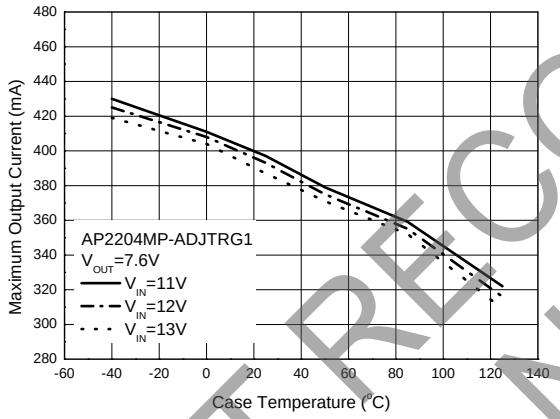
PSRR vs. Frequency
(Conditions: V_{PP}=2V, I_{OUT}=10mA)



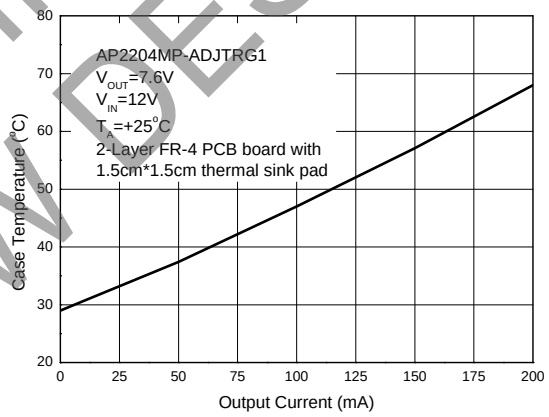
Output Voltage vs. Output Current



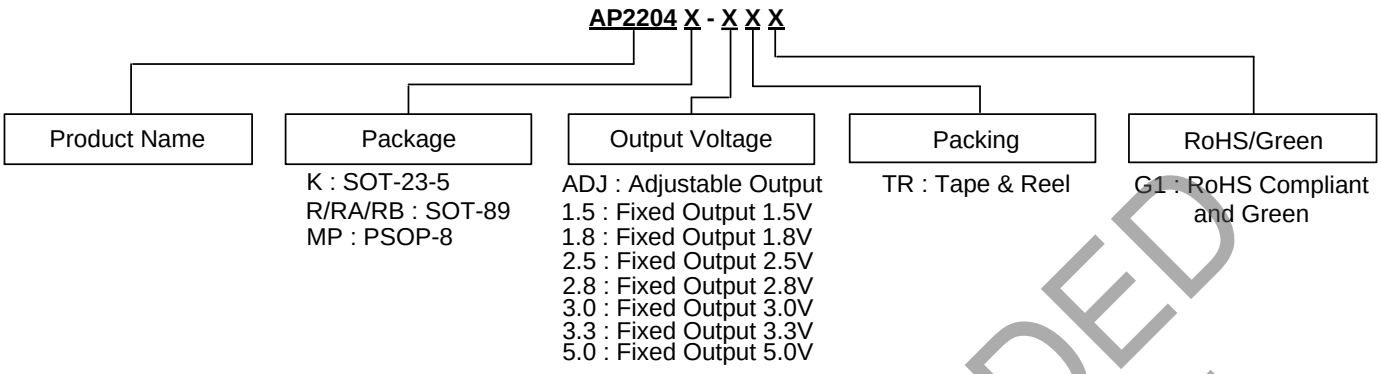
Maximum Output Current vs. Case Temperature



Case Temperature vs. Output Current



Ordering Information

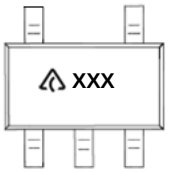


Package	Temperature Range	Output Voltage	Part Number	Marking ID	Packing
SOT-23-5	-40 to +85°C	ADJ	AP2204K-ADJTRG1	GAF	3000/7” Tape & Reel
		1.5V	AP2204K-1.5TRG1	GBH	3000/7” Tape & Reel
		1.8V	AP2204K-1.8TRG1	GAG	3000/7” Tape & Reel
		2.5V	AP2204K-2.5TRG1	GAD	3000/7” Tape & Reel
		2.8V	AP2204K-2.8TRG1	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

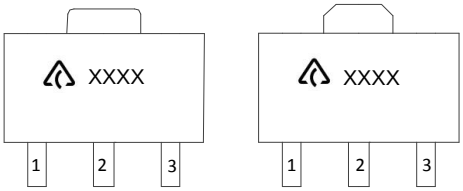
(Top View)



: Logo
XXX: Marking ID (See Ordering Information)

(2) SOT-89

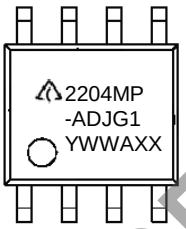
(Top View) **(Top View)**



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

(3) PSOP-8

(Top View)

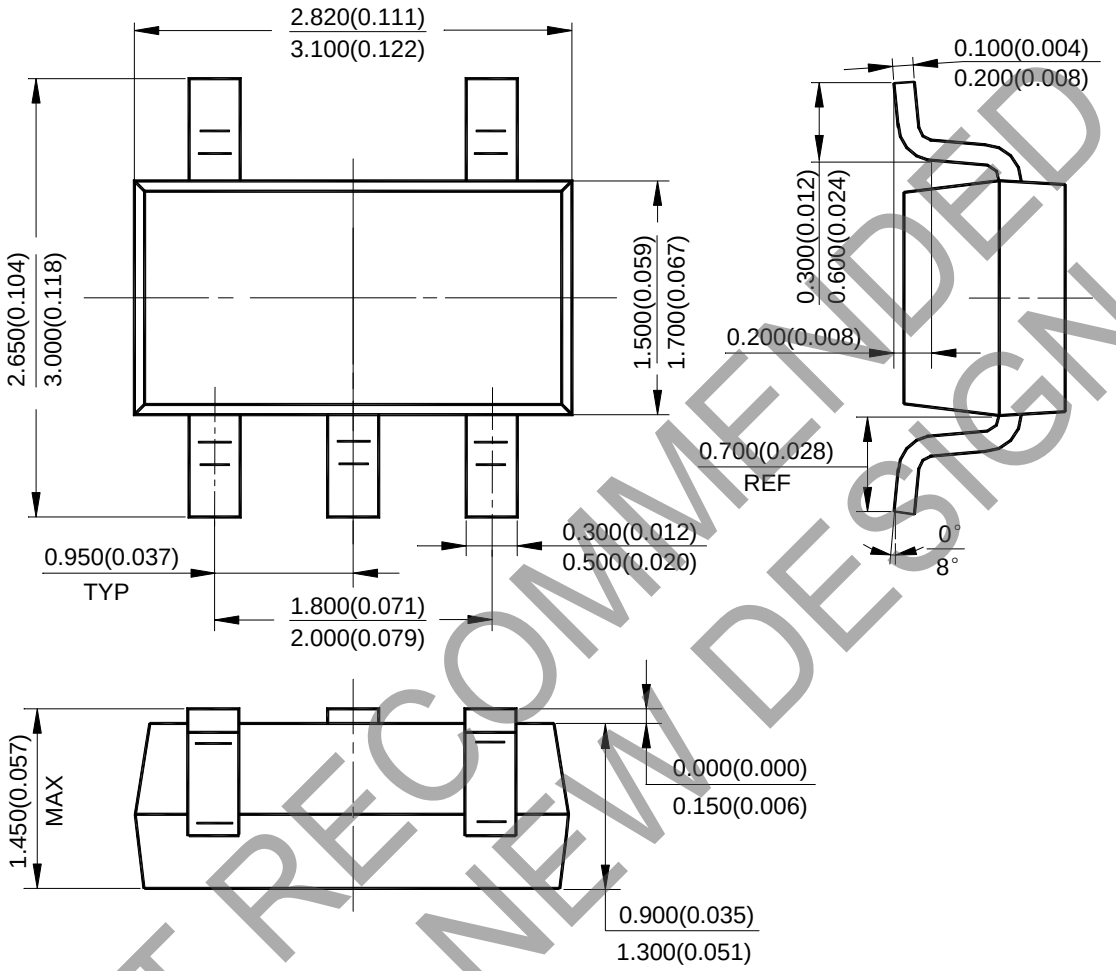


First and Second Lines: Logo and Marking ID
(See Ordering Information)
Third Line: Date Code
Y: Year
WW: Work Week of Molding
A: Assembly House Code
XX: 7th and 8th Digits of Batch Number

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

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

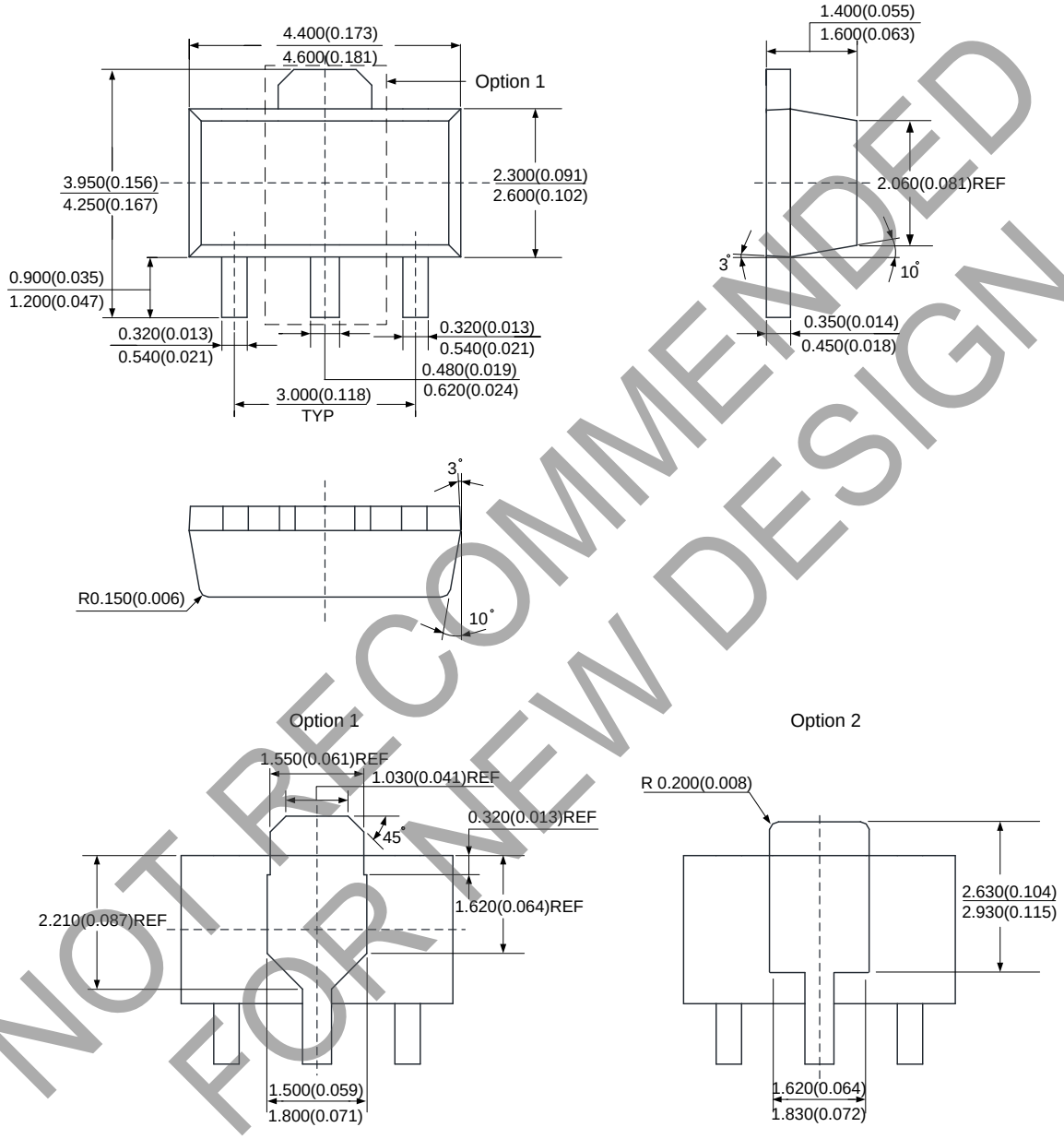
(1) Package Type: SOT-23-5



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

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

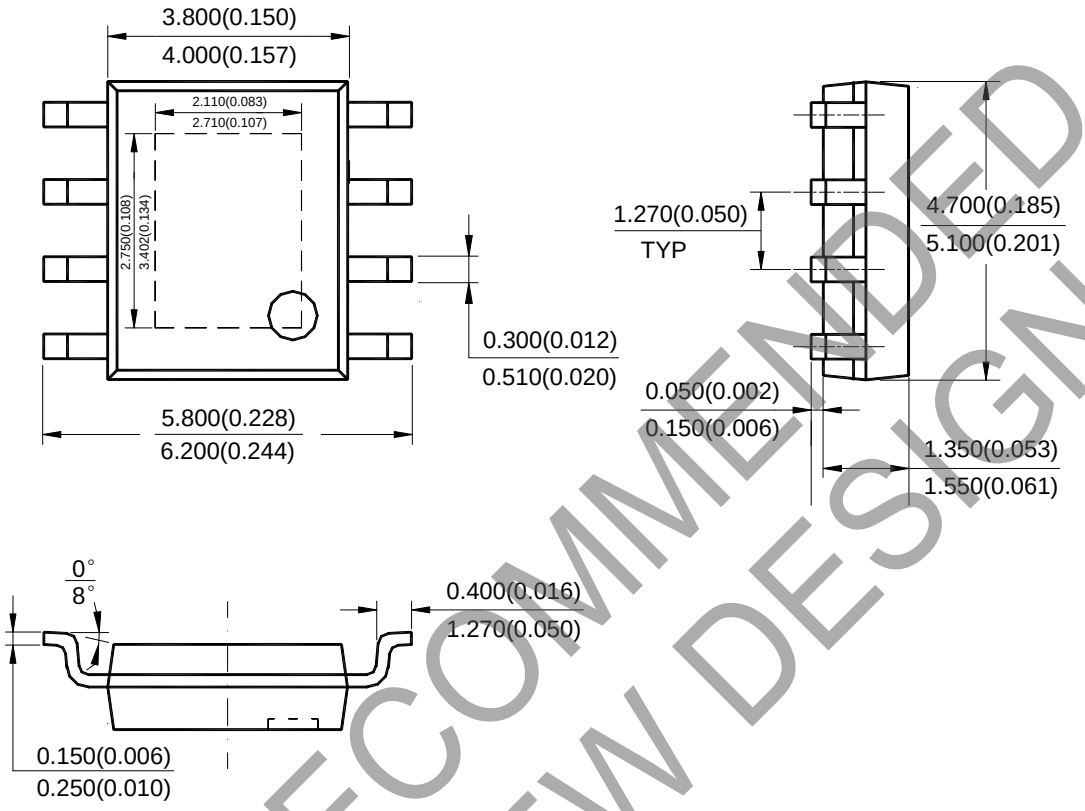
(2) Package Type: SOT-89



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

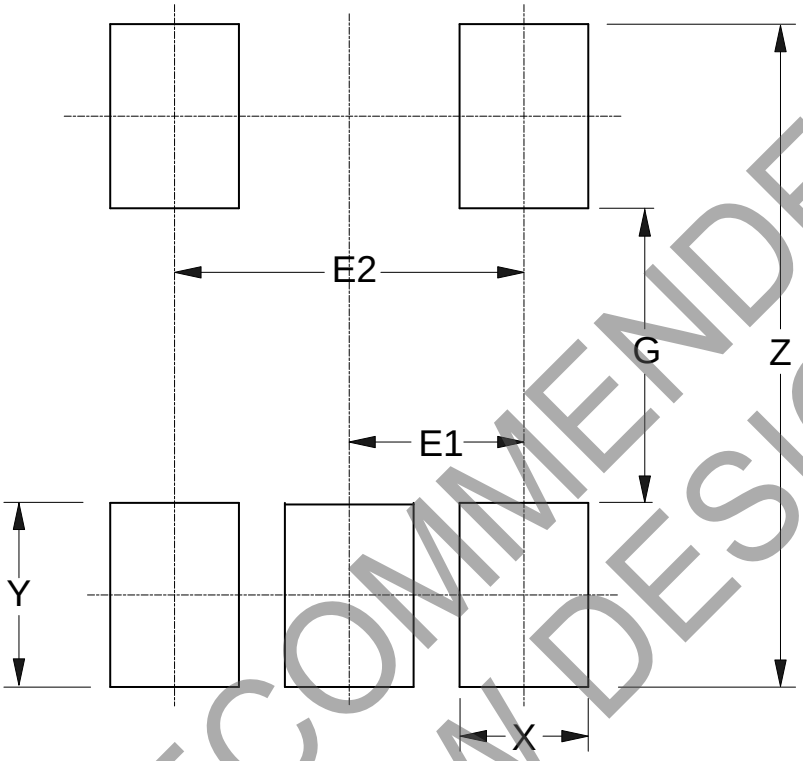


Note: Eject hole, oriented hole and mold mark is optional.

Suggested Pad Layout

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

(1) Package Type: SOT-23-5

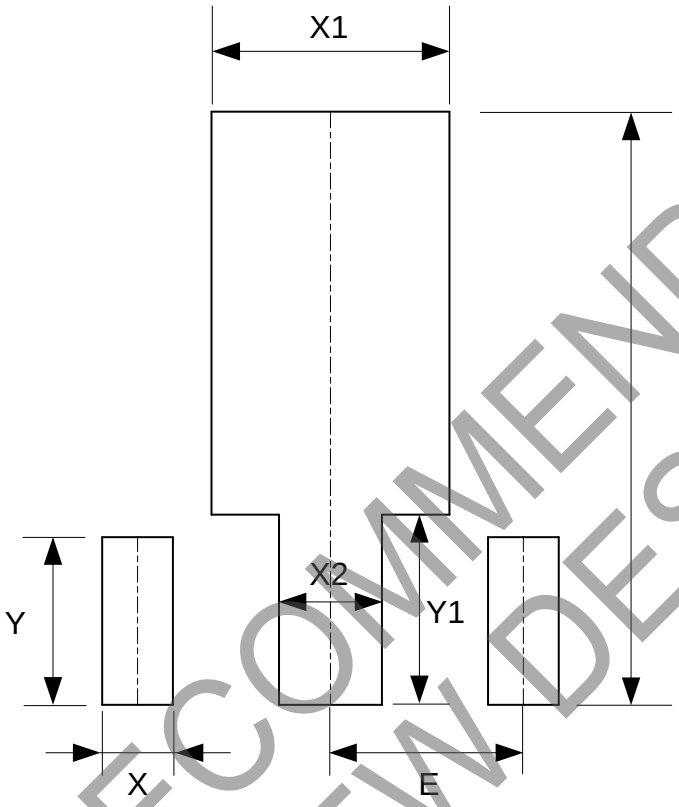


Dimensions	Z (mm)/(inch)	G (mm)/(inch)	X (mm)/(inch)	Y (mm)/(inch)	E1 (mm)/(inch)	E2 (mm)/(inch)
Value	3.600/0.142	1.600/0.063	0.700/0.028	1.000/0.039	0.950/0.037	1.900/0.075

Suggested Pad Layout (continued)

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

(2) Package Type: SOT-89

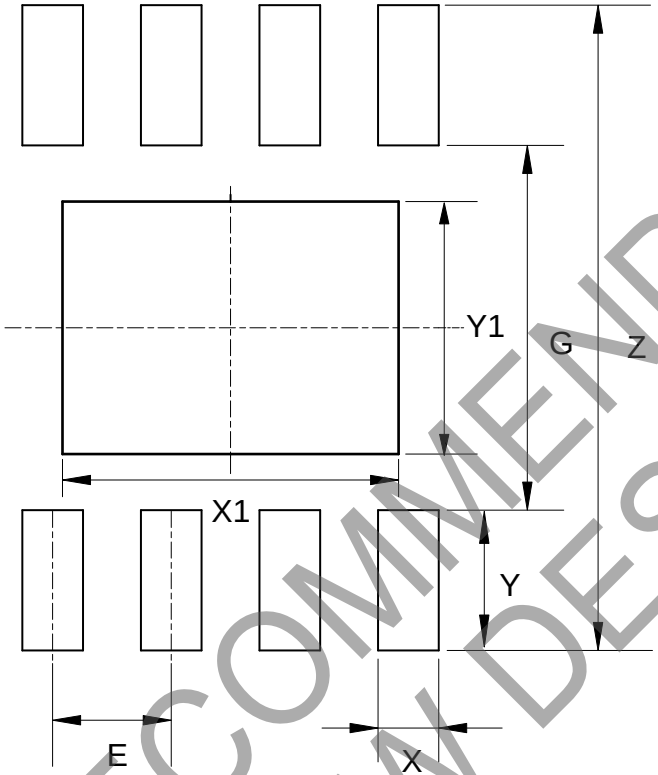


Dimensions	Z (mm)/(inch)	X (mm)/(inch)	X1 (mm)/(inch)	X2 (mm)/(inch)	Y (mm)/(inch)	Y1 (mm)/(inch)	E (mm)/(inch)
Value	4.600/0.181	0.550/0.022	1.850/0.073	0.800/0.031	1.300/0.051	1.475/0.058	1.500/0.059

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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