Description

The AP2121 series are positive voltage regulator ICs fabricated by CMOS process. Each of these ICs consists of a voltage reference, an error amplifier, a resistor network for setting output voltage, a current limit circuit for current protection and a chip-enable circuit (5-pin products only).

The AP2121 series feature high supply voltage ripple rejection, low dropout voltage, low noise, high output voltage accuracy, and low current consumption which make them ideal for use in various battery-powered devices.

The AP2121 series have 1.2V, 1.3V, 1.5V, 1.8V, 2.5V, 2.8V, 2.85V, 3.0V, 3.2V and 3.3V versions.

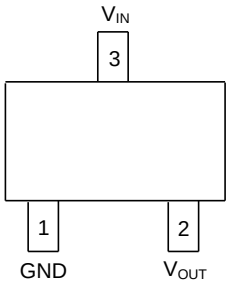
The AP2121 are available in standard SOT-23-3, SOT-23-5 and CSP-4 packages.

Features

- Low Dropout Voltage at I_{OUT} = 100mA: 150mV Typical (Except 1.2V, 1.3V and 1.5V Versions)
- Low Standby Current: 0.1µA Typical
- Low Quiescent Current: 25µA Typical
- High Ripple Rejection: 70dB Typical (f = 1kHz)
- Output Current: More Than 200mA (300mA Limit)
- Extremely Low Noise: 30µVrms (10Hz to 100kHz)
- Excellent Line Regulation: 4mV Typical
- Excellent Load Regulation: 12mV Typical
- High Output Voltage Accuracy: ±2%
- Excellent Line Transient Response and Load Transient Response
- Compatible with Low ESR Ceramic Capacitor (as Low as 1µF)
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

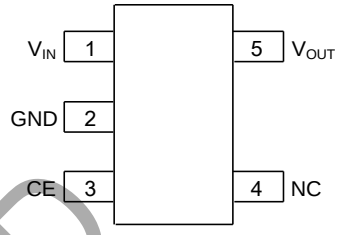
Pin Assignments

(Top View)



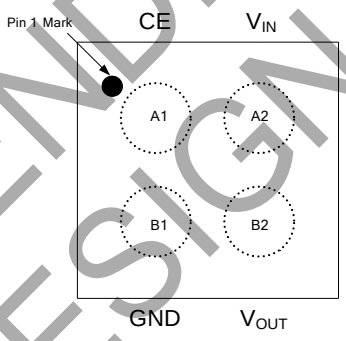
SOT-23-3

(Top View)



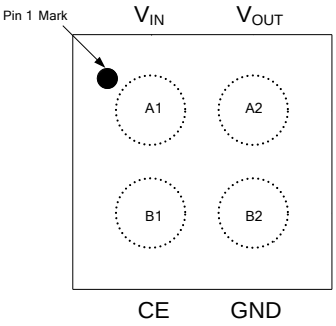
SOT-23-5

(Top View)



CSP-4 (P 0.5)/CSP-4 (P 0.4) (J4/J4A Package)

(Top View)



CSP-4 (P 0.5)/CSP-4 (P 0.4) (J4C/J4B Package)

Applications

- Mobile phones, cordless phones
- Wireless communication equipment
- Portable games
- Cameras, video recorders
- Sub-board power supplies for telecom equipment
- Battery-powered equipment

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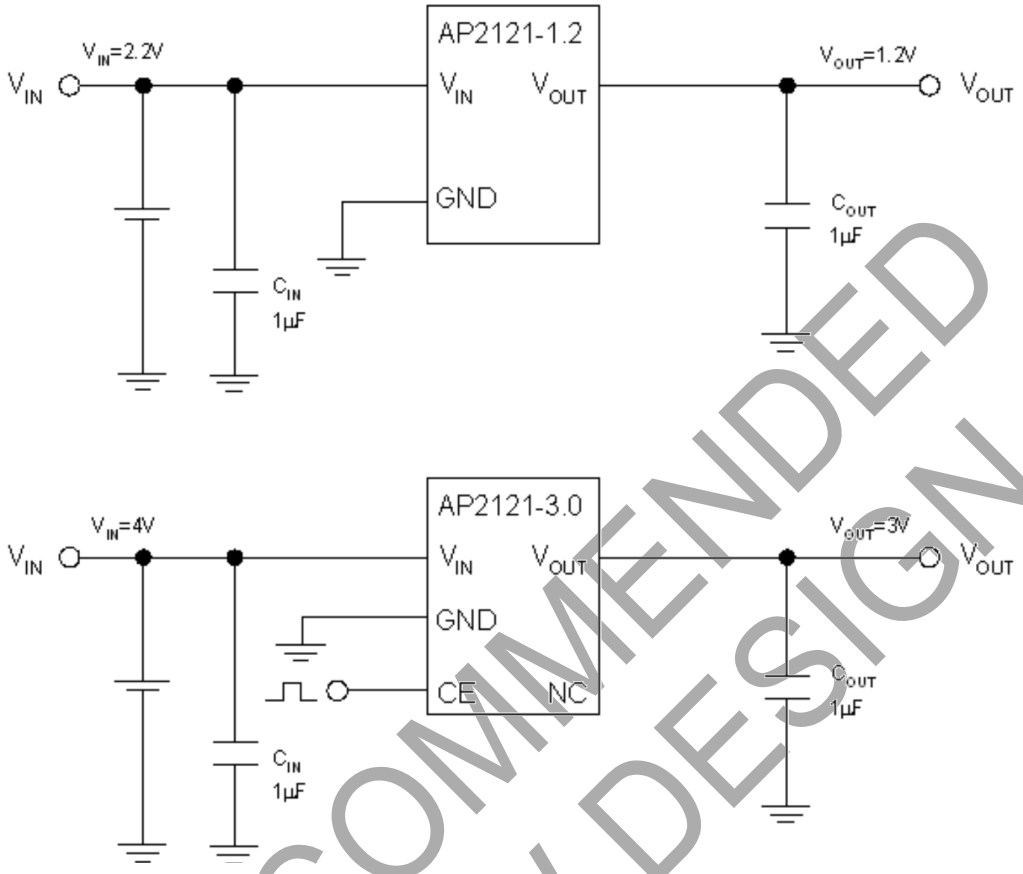
Typical Applications Circuit (Note 1)



Note: 1. Filter capacitors are required at the AP2121's input and output. 1µF capacitor is required at the input. The minimum output capacitance required for stability should be more than 1µF with ESR from 0.01Ω to 100Ω. Ceramic capacitors are recommended.

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Pin Descriptions

Pin Number				Pin Name	Function
SOT-23-3	SOT-23-5	CSP-4 (J4/J4A)	CSP-4 (J4C/J4B)		
3	1	A2	A1	V_{IN}	Input voltage
1	2	B1	B2	GND	Ground
—	3	A1	B1	CE	Active high enable input pin. Logic high = enable, logic low = shutdown
—	4	—	—	NC	No connection
2	5	B2	A2	V_{OUT}	Regulated output voltage

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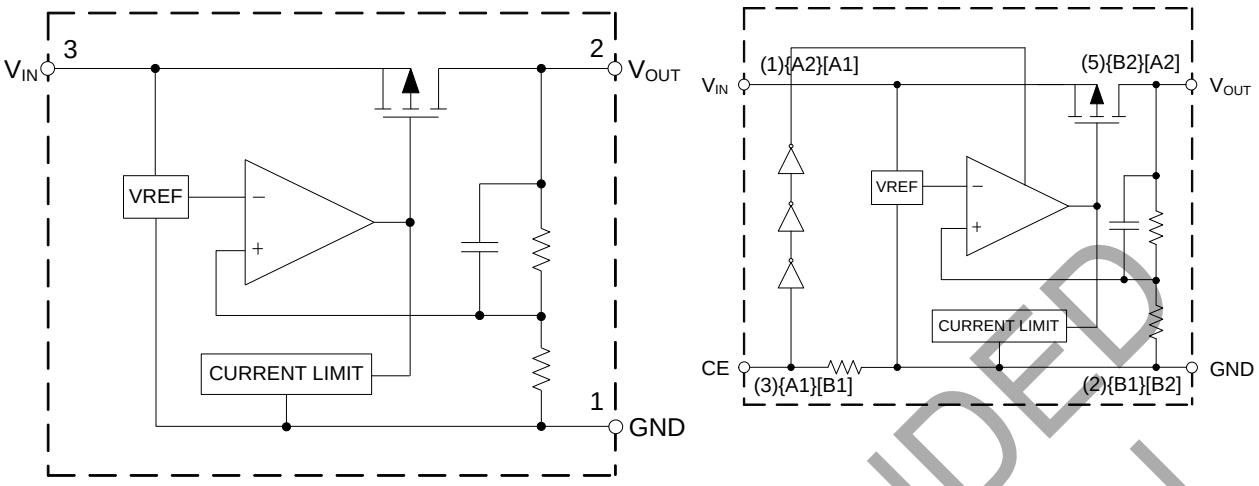
Functional Block Diagram



A(B){C}[D]
A: SOT-23-3
(B): SOT-23-5
{C}: CSP-4(J4/J4A)
[D]: CSP-4(J4C/J4B)

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Absolute Maximum Ratings (Note 2)

Symbol	Parameter	Rating		Unit
V_{IN}	Input Voltage	6.5		V
V_{CE}	Enable Input Voltage	-0.3 to V_{IN} +0.3		V
I_{OUT}	Output Current	300		mA
T_J	Junction Temperature	+150		°C
T_{STG}	Storage Temperature Range	-65 to +150		°C
T_{LEAD}	Lead Temperature (Soldering, 10sec)	+260		°C
θ_{JA}	Thermal Resistance (Junction to Ambient) (Note 3)	SOT-23-3	250	°C/W
		SOT-23-5	250	
		CSP-4	126	
ESD	ESD (Human Body Model)	2000		V
ESD	ESD (Machine Model)	200		V

Notes:
2. 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.
3. Absolute maximum ratings indicate limits beyond which damage to the component may occur. Electrical specifications do not apply when operating the device outside of its operating ratings. The maximum allowable power dissipation is a function of the maximum junction temperature, $T_{J(max)}$, the junction-to-ambient thermal resistance, θ_{JA}, and the ambient temperature, T_A. The maximum allowable power dissipation at any ambient temperature is calculated using: $P_{D(max)} = (T_{J(max)} - T_A) / \theta_{JA}$. Exceeding the maximum allowable power dissipation will result in excessive die temperature.

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{IN}	Input Voltage	2	6	V
T_A	Operating Ambient Temperature Range	-40	+85	°C

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Electrical Characteristics

AP2121-1.2 Electrical Characteristics (@V_{IN} = 2.2V, T_J = +25°C, C_{IN} = 1µF, C_{OUT} = 1µF, **Bold** typeface applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = 2.2V 1mA ≤ I_{OUT} ≤ 30mA	1.176	1.2	1.224	V
V_{IN}	Input Voltage	—	—	—	6	V
I_{OUT}	Output Current	V_{IN}-V_{OUT} = 1V	200	—	—	mA
V_{RLOAD}	Load Regulation	V_{IN} = 2.2V 1mA ≤ I_{OUT} ≤ 80mA	—	12	40	mV
V_{RLINE}	Line Regulation	2.2V ≤ V_{IN} ≤ 6V I_{OUT} = 30mA	—	4	16	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA	—	700	900	mV
		I_{OUT} = 100mA	—	700	900	
		I_{OUT} = 150mA	—	700	900	
		I_{OUT} = 200mA	—	700	900	
I_Q	Quiescent Current	V_{IN} = 2.2V, I_{OUT} = 0mA	—	25	50	µA
I_{STD}	Standby Current	V_{IN} = 2.2V V_{CE} in OFF mode	—	0.1	1	µA
PSRR	Power Supply Rejection Ratio	Ripple 0.5Vp-p, f = 1kHz V_{IN} = 2.2V	—	70	—	dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA	—	**±120**	—	µV/°C
$(\Delta V_{OUT}/V_{OUT})/\Delta T$			—	**±100**	—	ppm/°C
I_{LIMIT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
V_{NOISE}	RMS Output Noise	T_A = +25°C 10Hz ≤ f ≤ 100kHz	—	30	—	µVrms
—	CE "High" Voltage	CE input voltage "High"	1.5	—	—	V
—	CE "Low" Voltage	CE input voltage "Low"	—	—	0.25	V
R_{PD}	CE Pull-Down Resistance	—	2.5	5	10	MΩ
θ_{JC}	Thermal Resistance (Junction to Case)	SOT-23-3	—	74	—	°C/W
		SOT-23-5	—	74	—	
		CSP-4	—	5	—	

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Electrical Characteristics (continued)

AP2121-1.3 Electrical Characteristics (@V_{IN} = 2.3V, T_J = +25°C, C_{IN} = 1µF, C_{OUT} = 1µF, **Bold** typeface applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = 2.3V 1mA ≤ I_{OUT} ≤ 30mA	1.274	1.3	1.326	V
V_{IN}	Input Voltage	—	—	—	6	V
I_{OUT}	Output Current	V_{IN}-V_{OUT} = 1V	200	—	—	mA
V_{RLOAD}	Load Regulation	V_{IN} = 2.3V 1mA ≤ I_{OUT} ≤ 80mA	—	12	40	mV
V_{RLINE}	Line Regulation	2.3V ≤ V_{IN} ≤ 6V I_{OUT} = 30mA	—	4	16	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA	—	600	800	mV
		I_{OUT} = 100mA	—	600	800	
		I_{OUT} = 150mA	—	600	800	
		I_{OUT} = 200mA	—	600	800	
I_Q	Quiescent Current	V_{IN} = 2.3V, I_{OUT} = 0mA	—	25	50	µA
I_{STD}	Standby Current	V_{IN} = 2.3V V_{CE} in OFF mode	—	0.1	1	µA
PSRR	Power Supply Rejection Ratio	Ripple 0.5Vp-p, f = 1kHz V_{IN} = 2.3V	—	70	—	dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA	—	**±130**	—	µV/°C
$(\Delta V_{OUT}/V_{OUT})/\Delta T$			—	**±100**	—	ppm/°C
I_{LIMIT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
V_{NOISE}	RMS Output Noise	T_A = +25°C 10Hz ≤ f ≤ 100kHz	—	30	—	µVrms
—	CE "High" Voltage	CE input voltage "High"	1.5	—	—	V
—	CE "Low" Voltage	CE input voltage "Low"	—	—	0.25	V
R_{PD}	CE Pull-Down Resistance	—	2.5	5	10	MΩ
θ_{JC}	Thermal Resistance (Junction to Case)	SOT-23-3	—	74	—	°C/W
		SOT-23-5	—	74	—	
		CSP-4	—	5	—	

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Electrical Characteristics (continued)

AP2121-1.5 Electrical Characteristics (@V_{IN} = 2.5V, T_J = +25°C, C_{IN} = 1µF, C_{OUT} = 1µF, **Bold** typeface applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = 2.5V 1mA ≤ I_{OUT} ≤ 30mA	1.47	1.5	1.53	V
V_{IN}	Input Voltage	—	—	—	6	V
I_{OUT}	Output Current	V_{IN}-V_{OUT} = 1V	200	—	—	mA
V_{RLOAD}	Load Regulation	V_{IN} = 2.5V 1mA ≤ I_{OUT} ≤ 80mA	—	12	40	mV
V_{RLINE}	Line Regulation	2.3V ≤ V_{IN} ≤ 6V I_{OUT} = 30mA	—	4	16	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA	—	400	600	mV
		I_{OUT} = 100mA	—	400	600	
		I_{OUT} = 150mA	—	400	600	
		I_{OUT} = 200mA	—	400	600	
I_Q	Quiescent Current	V_{IN} = 2.5V, I_{OUT} = 0mA	—	25	50	µA
I_{STD}	Standby Current	V_{IN} = 2.5V V_{CE} in OFF mode	—	0.1	1	µA
PSRR	Power Supply Rejection Ratio	Ripple 0.5Vp-p, f = 1kHz V_{IN} = 2.5V	—	70	—	dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA	—	**±150**	—	µV/°C
$(\Delta V_{OUT}/V_{OUT})/\Delta T$			—	**±100**	—	ppm/°C
I_{LIMIT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
V_{NOISE}	RMS Output Noise	T_A = +25°C 10Hz ≤ f ≤ 100kHz	—	30	—	µVrms
—	CE "High" Voltage	CE input voltage "High"	1.5	—	—	V
—	CE "Low" Voltage	CE input voltage "Low"	—	—	0.25	V
R_{PD}	CE Pull-Down Resistance	—	2.5	5	10	MΩ
θ_{JC}	Thermal Resistance (Junction to Case)	SOT-23-3	—	74	—	°C/W
		SOT-23-5	—	74	—	
		CSP-4	—	5	—	

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Electrical Characteristics (continued)

AP2121-1.8 Electrical Characteristics (@V_{IN} = 2.8V, T_J = +25°C, C_{IN} = 1µF, C_{OUT} = 1µF, **Bold** typeface applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = 2.8V 1mA ≤ I_{OUT} ≤ 30mA	1.764	1.8	1.836	V
V_{IN}	Input Voltage	—	—	—	6	V
I_{OUT}	Output Current	V_{IN}-V_{OUT} = 1V	200	—	—	mA
V_{RLOAD}	Load Regulation	V_{IN} = 2.8V 1mA ≤ I_{OUT} ≤ 80mA	—	12	40	mV
V_{RLINE}	Line Regulation	2.3V ≤ V_{IN} ≤ 6V I_{OUT} = 30mA	—	4	16	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA	—	20	40	mV
		I_{OUT} = 100mA	—	150	300	
		I_{OUT} = 150mA	—	200	400	
		I_{OUT} = 200mA	—	250	500	
I_Q	Quiescent Current	V_{IN} = 2.8V, I_{OUT} = 0mA	—	25	50	µA
I_{STD}	Standby Current	V_{IN} = 2.8V V_{CE} in OFF mode	—	0.1	1	µA
PSRR	Power Supply Rejection Ratio	Ripple 0.5Vp-p, f = 1kHz V_{IN} = 2.8V	—	70	—	dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA	—	**±180**	—	µV/°C
$(\Delta V_{OUT}/V_{OUT})/\Delta T$			—	**±100**	—	ppm/°C
I_{LIMIT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
V_{NOISE}	RMS Output Noise	T_A = +25°C 10Hz ≤ f ≤ 100kHz	—	30	—	µVrms
—	CE "High" Voltage	CE input voltage "High"	1.5	—	—	V
—	CE "Low" Voltage	CE input voltage "Low"	—	—	0.25	V
R_{PD}	CE Pull-Down Resistance	—	2.5	5	10	MΩ
θ_{JC}	Thermal Resistance (Junction to Case)	SOT-23-3	—	74	—	°C/W
		SOT-23-5	—	74	—	
		CSP-4	—	5	—	

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Electrical Characteristics (continued)

AP2121-2.5 Electrical Characteristics (@V_{IN} = 3.5V, T_J = +25°C, C_{IN} = 1µF, C_{OUT} = 1µF, **Bold** typeface applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = 3.5V 1mA ≤ I_{OUT} ≤ 30mA	2.45	2.5	2.55	V
V_{IN}	Input Voltage	—	—	—	6	V
I_{OUT}	Output Current	V_{IN}-V_{OUT} = 1V	200	—	—	mA
V_{RLOAD}	Load Regulation	V_{IN} = 3.5V 1mA ≤ I_{OUT} ≤ 80mA	—	12	40	mV
V_{RLINE}	Line Regulation	3V ≤ V_{IN} ≤ 6V I_{OUT} = 30mA	—	4	16	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA	—	20	40	mV
		I_{OUT} = 100mA	—	150	300	
		I_{OUT} = 150mA	—	200	400	
		I_{OUT} = 200mA	—	250	500	
I_Q	Quiescent Current	V_{IN} = 3.5V, I_{OUT} = 0mA	—	25	50	µA
I_{STD}	Standby Current	V_{IN} = 3.5V V_{CE} in OFF mode	—	0.1	1	µA
PSRR	Power Supply Rejection Ratio	Ripple 0.5Vp-p, f = 1kHz V_{IN} = 3.5V	—	70	—	dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA	—	**±250**	—	µV/°C
$(\Delta V_{OUT}/V_{OUT})/\Delta T$			—	**±100**	—	ppm/°C
I_{LIMIT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
V_{NOISE}	RMS Output Noise	T_A = +25°C 10Hz ≤ f ≤ 100kHz	—	30	—	µVrms
—	CE "High" Voltage	CE input voltage "High"	1.5	—	—	V
—	CE "Low" Voltage	CE input voltage "Low"	—	—	0.25	V
R_{PD}	CE Pull-Down Resistance	—	2.5	5	10	MΩ
θ_{JC}	Thermal Resistance (Junction to Case)	SOT-23-3	—	74	—	°C/W
		SOT-23-5	—	74	—	
		CSP-4	—	5	—	

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Electrical Characteristics (continued)

AP2121-2.8 Electrical Characteristics (@V_{IN} = 3.8V, T_J = +25°C, C_{IN} = 1µF, C_{OUT} = 1µF, **Bold** typeface applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = 3.8V 1mA ≤ I_{OUT} ≤ 30mA	2.744	2.8	2.856	V
V_{IN}	Input Voltage	—	—	—	6	V
I_{OUT}	Output Current	V_{IN}-V_{OUT} = 1V	200	—	—	mA
V_{RLOAD}	Load Regulation	V_{IN} = 3.8V 1mA ≤ I_{OUT} ≤ 80mA	—	12	40	mV
V_{RLINE}	Line Regulation	3.3V ≤ V_{IN} ≤ 6V I_{OUT} = 30mA	—	4	16	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA	—	20	40	mV
		I_{OUT} = 100mA	—	150	300	
		I_{OUT} = 150mA	—	200	400	
		I_{OUT} = 200mA	—	250	500	
I_Q	Quiescent Current	V_{IN} = 3.8V, I_{OUT} = 0mA	—	25	50	µA
I_{STD}	Standby Current	V_{IN} = 3.8V V_{CE} in OFF mode	—	0.1	1	µA
PSRR	Power Supply Rejection Ratio	Ripple 0.5Vp-p, f = 1kHz V_{IN} = 3.8V	—	70	—	dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA	—	**±280**	—	µV/°C
$(\Delta V_{OUT}/V_{OUT})/\Delta T$			—	**±100**	—	ppm/°C
I_{LIMIT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
V_{NOISE}	RMS Output Noise	T_A = +25°C 10Hz ≤ f ≤ 100kHz	—	30	—	µVrms
—	CE "High" Voltage	CE input voltage "High"	1.5	—	—	V
—	CE "Low" Voltage	CE input voltage "Low"	—	—	0.25	V
R_{PD}	CE Pull-down Resistance	—	2.5	5	10	MΩ
θ_{JC}	Thermal Resistance (Junction to Case)	SOT-23-3	—	74	—	°C/W
		SOT-23-5	—	74	—	
		CSP-4	—	5	—	

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Electrical Characteristics (continued)

AP2121-2.85 Electrical Characteristics (@V_{IN} = 3.85V, T_J = +25°C, C_{IN} = 1µF, C_{OUT} = 1µF, **Bold** typeface applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = 3.85V 1mA ≤ I_{OUT} ≤ 30mA	2.793	2.85	2.907	V
V_{IN}	Input Voltage	—	—	—	6	V
I_{OUT}	Output Current	V_{IN}-V_{OUT} = 1V	200	—	—	mA
V_{RLOAD}	Load Regulation	V_{IN} = 3.85V 1mA ≤ I_{OUT} ≤ 80mA	—	12	40	mV
V_{RLINE}	Line Regulation	3.3V ≤ V_{IN} ≤ 6V I_{OUT} = 30mA	—	4	16	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA	—	20	40	mV
		I_{OUT} = 100mA	—	150	300	
		I_{OUT} = 150mA	—	200	400	
		I_{OUT} = 200mA	—	250	500	
I_Q	Quiescent Current	V_{IN} = 3.85V, I_{OUT} = 0mA	—	25	50	µA
I_{STD}	Standby Current	V_{IN} = 3.85V V_{CE} in OFF mode	—	0.1	1	µA
PSRR	Power Supply Rejection Ratio	Ripple 0.5Vp-p, f = 1kHz V_{IN} = 3.85V	—	70	—	dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA	—	**±280**	—	µV/°C
$(\Delta V_{OUT}/V_{OUT})/\Delta T$			—	**±100**	—	ppm/°C
I_{LIMIT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
V_{NOISE}	RMS Output Noise	T_A = +25°C 10Hz ≤ f ≤ 100kHz	—	30	—	µVrms
—	CE "High" Voltage	CE input voltage "High"	1.5	—	—	V
—	CE "Low" Voltage	CE input voltage "Low"	—	—	0.25	V
R_{PD}	CE Pull-Down Resistance	—	2.5	5	10	MΩ
θ_{JC}	Thermal Resistance (Junction to Case)	CSP-4	—	5	—	°C/W

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Electrical Characteristics (continued)

AP2121-3.0 Electrical Characteristics (@V_{IN} = 4V, T_J = +25°C, C_{IN} = 1µF, C_{OUT} = 1µF, **Bold** typeface applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = 4V 1mA ≤ I_{OUT} ≤ 30mA	2.94	3.0	3.06	V
V_{IN}	Input Voltage	—	—	—	6	V
I_{OUT}	Output Current	V_{IN}-V_{OUT} = 1V	200	—	—	mA
V_{RLOAD}	Load Regulation	V_{IN} = 4V 1mA ≤ I_{OUT} ≤ 80mA	—	12	40	mV
V_{RLINE}	Line Regulation	3.5V ≤ V_{IN} ≤ 6V I_{OUT} = 30mA	—	4	16	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA	—	20	40	mV
		I_{OUT} = 100mA	—	150	300	
		I_{OUT} = 150mA	—	200	400	
		I_{OUT} = 200mA	—	250	500	
I_Q	Quiescent Current	V_{IN} = 4V, I_{OUT} = 0mA	—	25	50	µA
I_{STD}	Standby Current	V_{IN} = 4V V_{CE} in OFF mode	—	0.1	1	µA
PSRR	Power Supply Rejection Ratio	Ripple 0.5Vp-p, f = 1kHz V_{IN} = 4V	—	70	—	dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA	—	**±300**	—	µV/°C
$(\Delta V_{OUT}/V_{OUT})/\Delta T$			—	**±100**	—	ppm/°C
I_{LIMIT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
V_{NOISE}	RMS Output Noise	T_A = +25°C 10Hz ≤ f ≤ 100kHz	—	30	—	µVrms
—	CE "High" Voltage	CE input voltage "High"	1.5	—	—	V
—	CE "Low" Voltage	CE input voltage "Low"	—	—	0.25	V
R_{PD}	CE Pull-Down Resistance	—	2.5	5	10	MΩ
θ_{JC}	Thermal Resistance (Junction to Case)	SOT-23-3	—	74	—	°C/W
		SOT-23-5	—	74	—	
		CSP-4	—	5	—	

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Electrical Characteristics (continued)

AP2121-3.2 Electrical Characteristics (@V_{IN} = 4.2V, T_J = +25°C, C_{IN} = 1µF, C_{OUT} = 1µF, **Bold** typeface applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = 4.2V 1mA ≤ I_{OUT} ≤ 30mA	3.136	3.2	3.264	V
V_{IN}	Input Voltage	—	—	—	6	V
I_{OUT}	Output Current	V_{IN}-V_{OUT} = 1V	200	—	—	mA
V_{RLOAD}	Load Regulation	V_{IN} = 4.2V 1mA ≤ I_{OUT} ≤ 80mA	—	12	40	mV
V_{RLINE}	Line Regulation	3.7V ≤ V_{IN} ≤ 6V I_{OUT} = 30mA	—	4	16	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA	—	20	40	mV
		I_{OUT} = 100mA	—	150	300	
		I_{OUT} = 150mA	—	200	400	
		I_{OUT} = 200mA	—	250	500	
I_Q	Quiescent Current	V_{IN} = 4.2V, I_{OUT} = 0mA	—	25	50	µA
I_{STD}	Standby Current	V_{IN} = 4.2V V_{CE} in OFF mode	—	0.1	1	µA
PSRR	Power Supply Rejection Ratio	Ripple 0.5Vp-p, f = 1kHz V_{IN} = 4.2V	—	70	—	dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA	—	**±320**	—	µV/°C
$(\Delta V_{OUT}/V_{OUT})/\Delta T$			—	**±100**	—	ppm/°C
I_{LIMIT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
V_{NOISE}	RMS Output Noise	T_A = +25°C 10Hz ≤ f ≤ 100kHz	—	30	—	µVrms
—	CE "High" Voltage	CE input voltage "High"	1.5	—	—	V
—	CE "Low" Voltage	CE input voltage "Low"	—	—	0.25	V
R_{PD}	CE Pull-Down Resistance	—	2.5	5	10	MΩ
θ_{JC}	Thermal Resistance (Junction to Case)	SOT-23-3	—	74	—	°C/W
		SOT-23-5	—	74	—	
		CSP-4	—	5	—	

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Electrical Characteristics (continued)

AP2121-3.3 Electrical Characteristics (@V_{IN} = 4.3V, T_J = +25°C, C_{IN} = 1µF, C_{OUT} = 1µF, **Bold** typeface applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = 4.3V 1mA ≤ I_{OUT} ≤ 30mA	3.234	3.3	3.366	V
V_{IN}	Input Voltage	—	—	—	6	V
I_{OUT}	Output Current	V_{IN}-V_{OUT} = 1V	200	—	—	mA
V_{RLOAD}	Load Regulation	V_{IN} = 4.3V 1mA ≤ I_{OUT} ≤ 80mA	—	12	40	mV
V_{RLINE}	Line Regulation	3.8V ≤ V_{IN} ≤ 6V I_{OUT} = 30mA	—	4	16	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA	—	20	40	mV
		I_{OUT} = 100mA	—	150	300	
		I_{OUT} = 150mA	—	200	400	
		I_{OUT} = 200mA	—	250	500	
I_Q	Quiescent Current	V_{IN} = 4.3V, I_{OUT} = 0mA	—	25	50	µA
I_{STD}	Standby Current	V_{IN} = 4.3V V_{CE} in OFF mode	—	0.1	1	µA
PSRR	Power Supply Rejection Ratio	Ripple 0.5Vp-p, f = 1kHz V_{IN} = 4.3V	—	70	—	dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA	—	**±330**	—	µV/°C
$(\Delta V_{OUT}/V_{OUT})/\Delta T$			—	**±100**	—	ppm/°C
I_{LIMIT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
V_{NOISE}	RMS Output Noise	T_A = +25°C 10Hz ≤ f ≤ 100kHz	—	30	—	µVrms
—	CE "High" Voltage	CE input voltage "High"	1.5	—	—	V
—	CE "Low" Voltage	CE input voltage "Low"	—	—	0.25	V
R_{PD}	CE Pull-Down Resistance	—	2.5	5	10	MΩ
θ_{JC}	Thermal Resistance (Junction to Case)	SOT-23-3	—	74	—	°C/W
		SOT-23-5	—	74	—	
		CSP-4	—	5	—	

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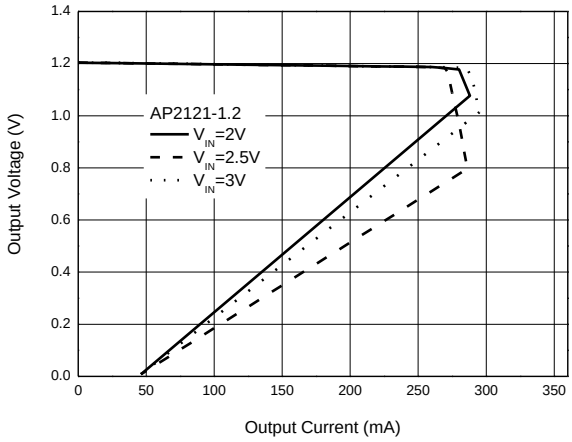
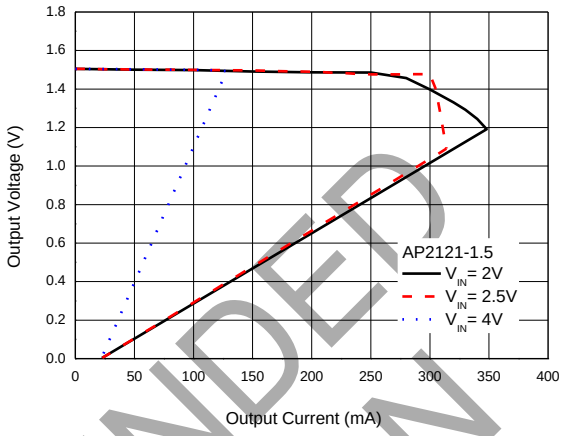
Performance Characteristics

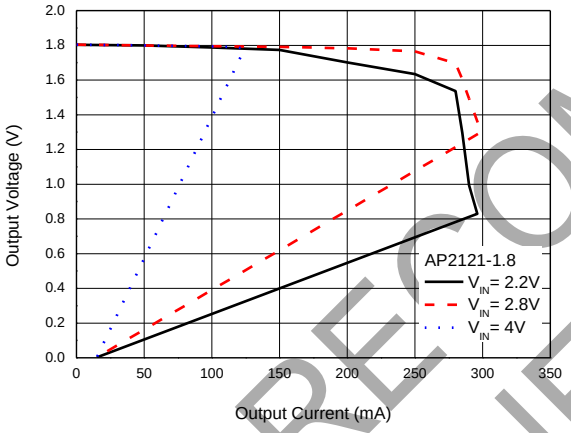
Output Voltage vs. Output Current



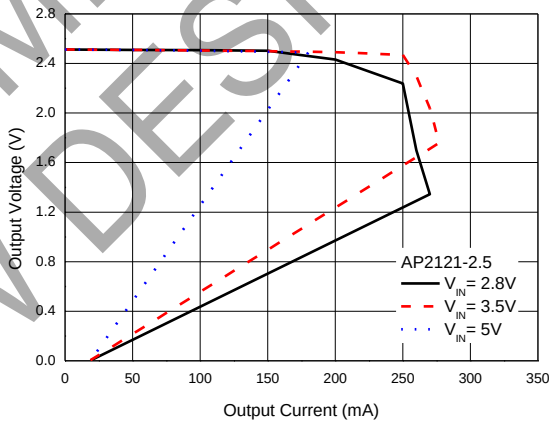
Output Voltage vs. Output Current



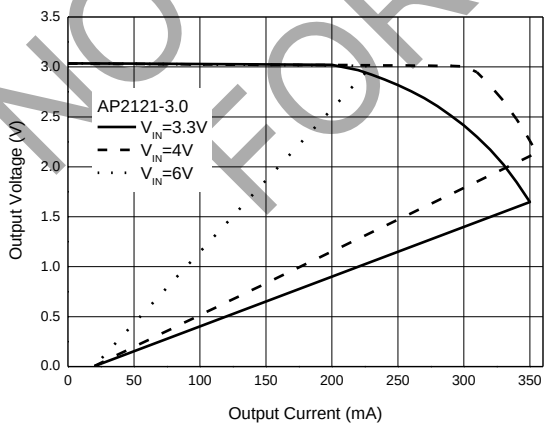
Output Voltage vs. Output Current



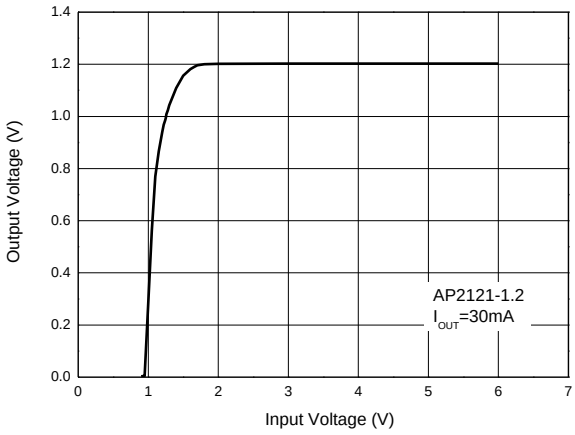
Output Voltage vs. Output Current



Output Voltage vs. Output Current



Output Voltage vs. Input Voltage



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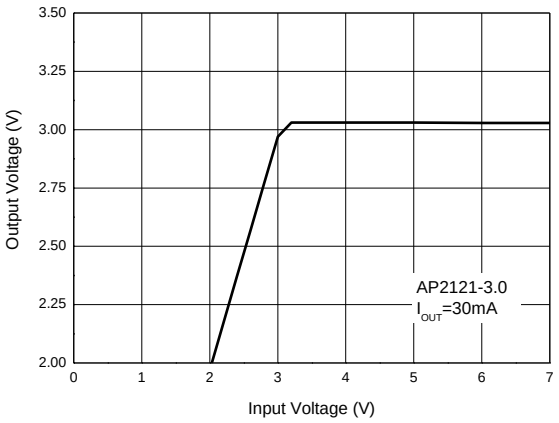
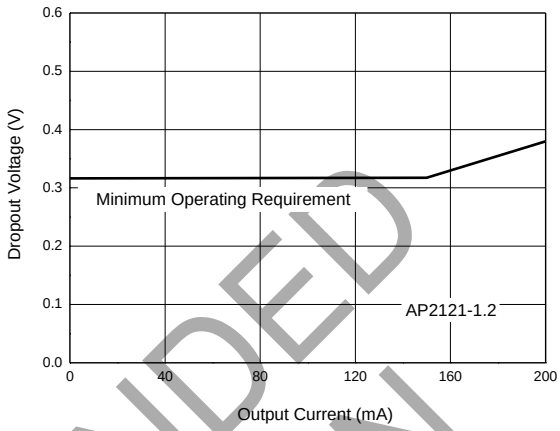
Performance Characteristics (continued)

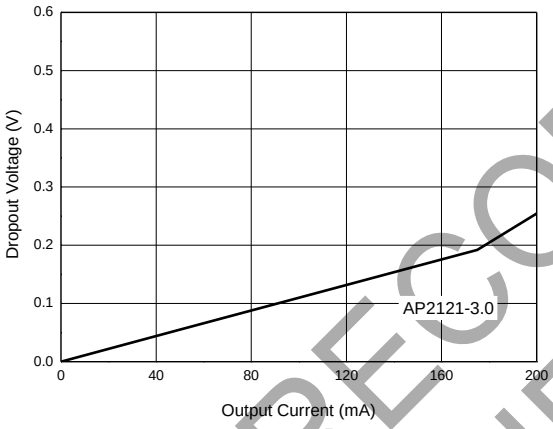
Output Voltage vs. Input Voltage



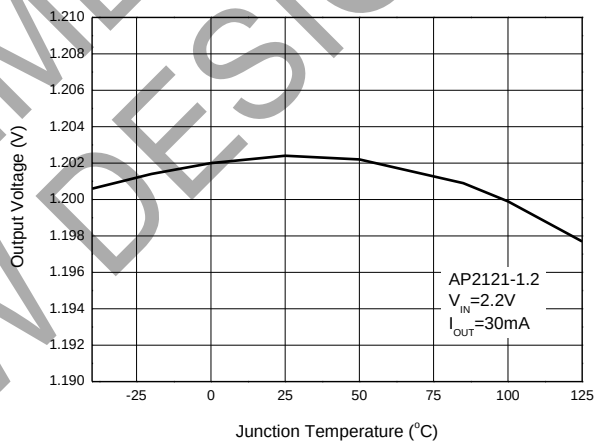
Dropout Voltage vs. Output Current



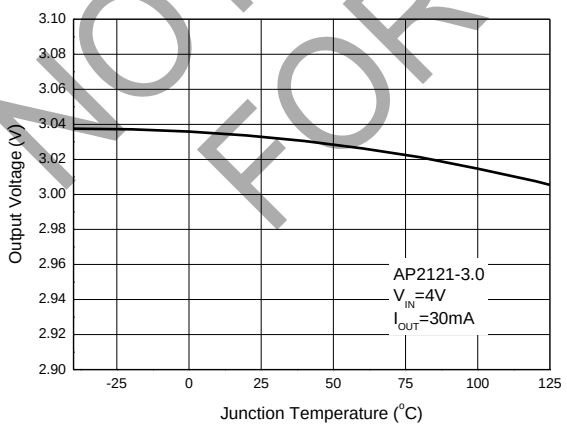
Dropout Voltage vs. Output Current



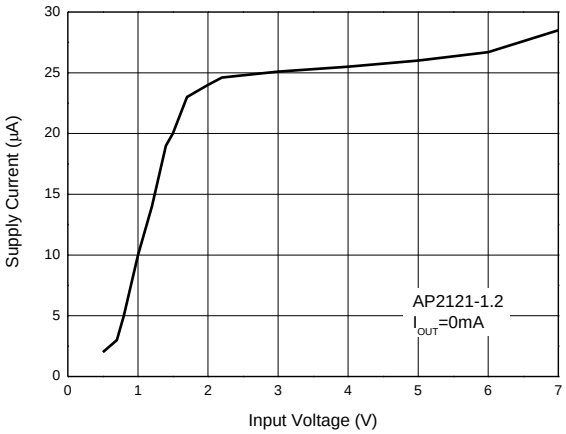
Output Voltage vs. Junction Temperature



Output Voltage vs. Junction Temperature



Supply Current vs. Input Voltage



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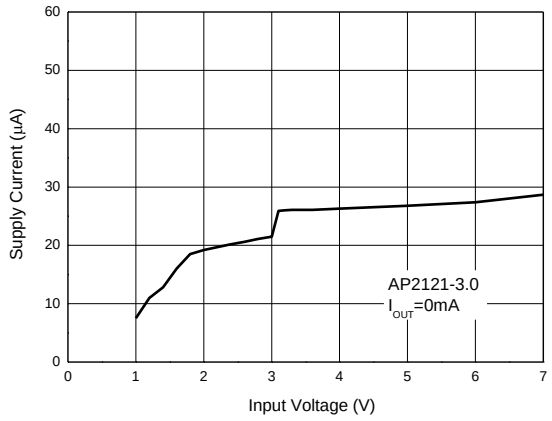
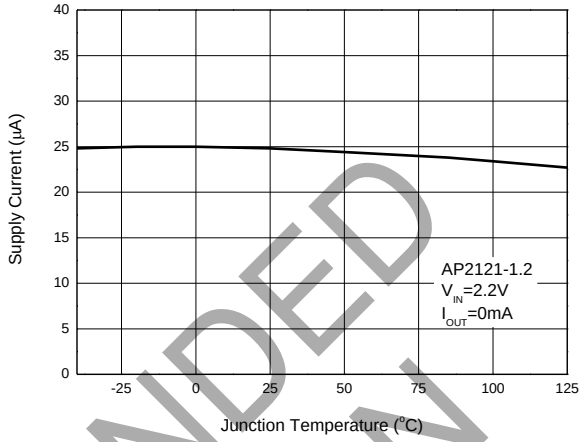
Performance Characteristics (continued)

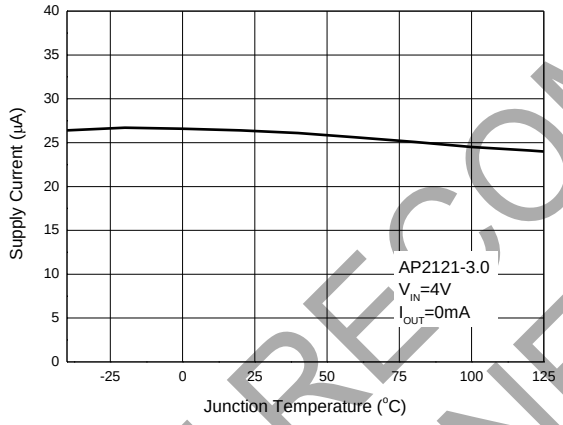
Supply Current vs. Input Voltage



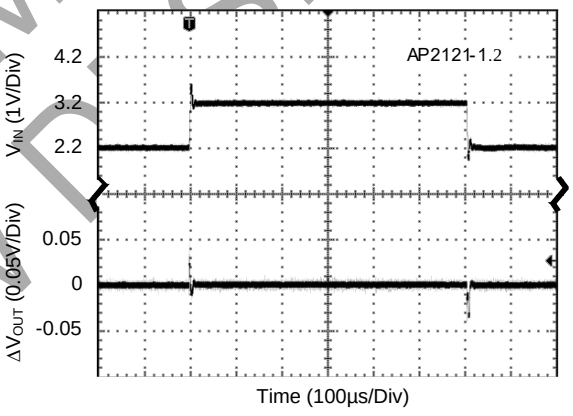
Supply Current vs. Junction Temperature



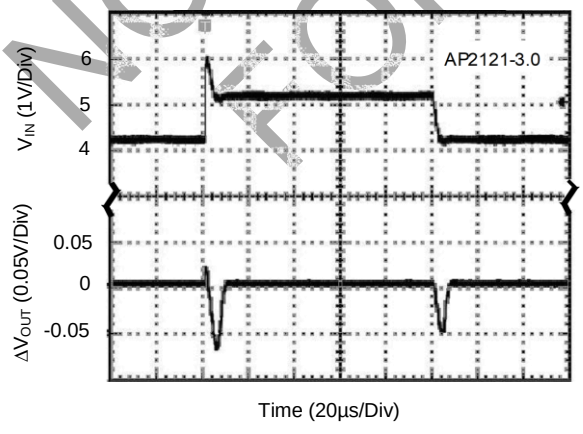
Supply Current vs. Junction Temperature



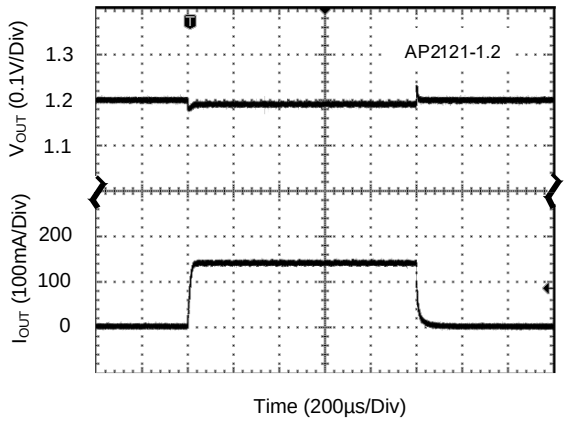
Line Transient
(Conditions: I_{OUT}=30mA, C_{IN}=1μF, C_{OUT}=1μF)



Line Transient
(Conditions: I_{OUT}=30mA, C_{IN}=1μF, C_{OUT}=1μF)



Load Transient
(Conditions: V_{IN}=2.2V, C_{IN}=1μF, C_{OUT}=1μF)



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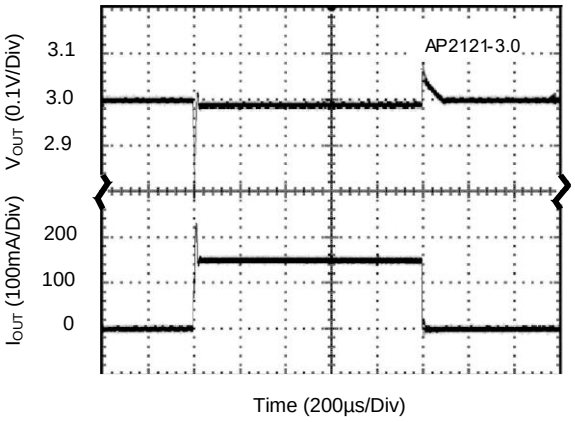
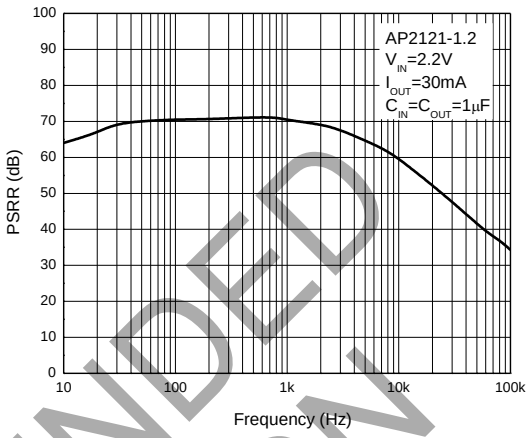
Performance Characteristics (continued)

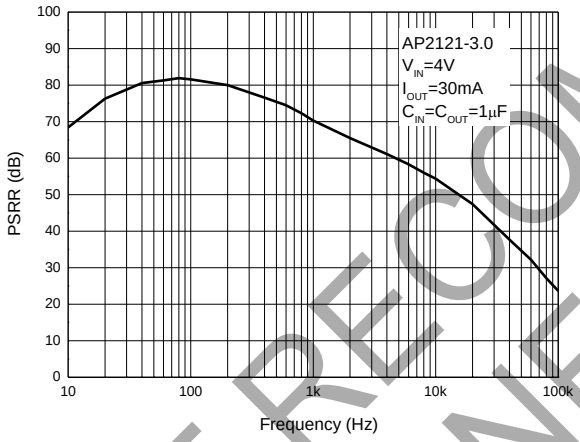
Load Transient
(Conditions: V_{IN}=4V, C_{IN}=1µF, C_{OUT}=1µF)



PSRR vs. Frequency



PSRR vs. Frequency



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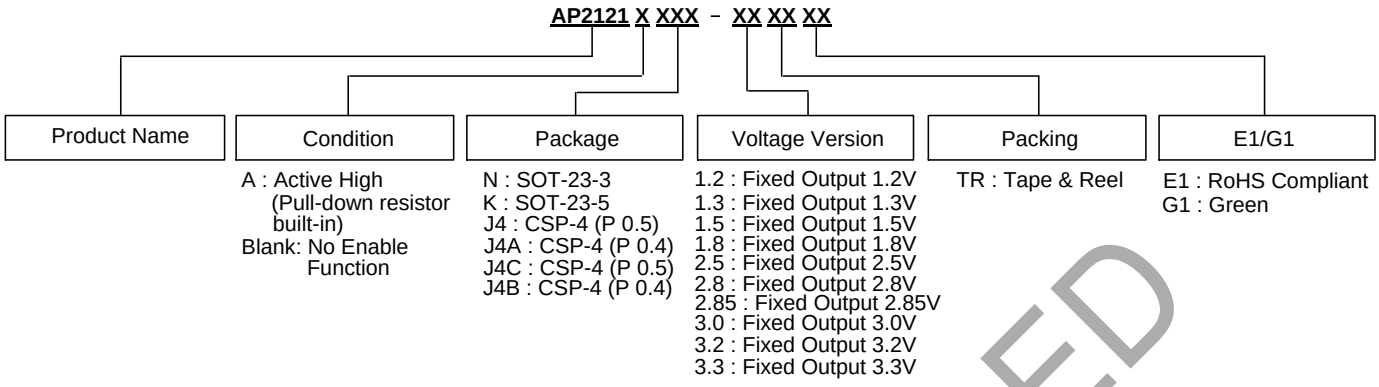
Ordering Information



Package	Temperature Range	Condition	Part Number		Marking ID		Packing
			Lead Free	Green	Lead Free	Green	
SOT-23-3	-40 to +85ºC	—	AP2121N-1.2TRE1	AP2121N-1.2TRG1	EF9	GF9	Tape & Reel
		—	AP2121N-1.3TRE1	AP2121N-1.3TRG1	EG9	GG9	Tape & Reel
		—	AP2121N-1.5TRE1	AP2121N-1.5TRG1	EF1	GF1	Tape & Reel
		—	AP2121N-1.8TRE1	AP2121N-1.8TRG1	EF3	GF3	Tape & Reel
		—	AP2121N-2.5TRE1	AP2121N-2.5TRG1	EF4	GF4	Tape & Reel
		—	AP2121N-2.8TRE1	AP2121N-2.8TRG1	EF5	GF5	Tape & Reel
		—	AP2121N-3.0TRE1	AP2121N-3.0TRG1	EF6	GF6	Tape & Reel
		—	AP2121N-3.2TRE1	AP2121N-3.2TRG1	EF7	GF7	Tape & Reel
		—	AP2121N-3.3TRE1	AP2121N-3.3TRG1	EF8	GF8	Tape & Reel

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Ordering Information (continued)

Package	Temperature Range	Condition	Part Number		Marking ID		Packing
			Lead Free	Green	Lead Free	Green	
SOT-23-5	-40 to +85°C	Active High (Pull-down resistor built-in)	AP2121AK-1.2TRE1	AP2121AK-1.2TRG1	E1T	G1T	Tape & Reel
		Active High (Pull-down resistor built-in)	AP2121AK-1.3TRE1	AP2121AK-1.3TRG1	E1R	G1R	Tape & Reel
		Active High (Pull-down resistor built-in)	AP2121AK-1.5TRE1	AP2121AK-1.5TRG1	E1Z	G1Z	Tape & Reel
		Active High (Pull-down resistor built-in)	AP2121AK-1.8TRE1	AP2121AK-1.8TRG1	E1U	G1U	Tape & Reel
		Active High (Pull-down resistor built-in)	AP2121AK-2.5TRE1	AP2121AK-2.5TRG1	E1V	G1V	Tape & Reel
		Active High (Pull-down resistor built-in)	AP2121AK-2.8TRE1	AP2121AK-2.8TRG1	E1W	G1W	Tape & Reel
		Active High (Pull-down resistor built-in)	AP2121AK-3.0TRE1	AP2121AK-3.0TRG1	E1X	G1X	Tape & Reel
		Active High (Pull-down resistor built-in)	AP2121AK-3.2TRE1	AP2121AK-3.2TRG1	E3Z	G3Z	Tape & Reel
		Active High (Pull-down resistor built-in)	AP2121AK-3.3TRE1	AP2121AK-3.3TRG1	E1Y	G1Y	Tape & Reel
CSP-4	-40 to +85°C	0.4 Pitch	—	AP2121AJ4A-1.2TRG1	—	CB	Tape & Reel
		0.4 Pitch	—	AP2121AJ4A-1.3TRG1	—	CC	Tape & Reel
		0.4 Pitch	—	AP2121AJ4A-1.5TRG1	—	CD	Tape & Reel
		0.4 Pitch	—	AP2121AJ4A-1.8TRG1	—	CE	Tape & Reel
		0.4 Pitch	—	AP2121AJ4A-2.5TRG1	—	CF	Tape & Reel
		0.4 Pitch	—	AP2121AJ4A-2.8TRG1	—	CG	Tape & Reel
		0.4 Pitch	—	AP2121AJ4A-2.85TRG1	—	DD	Tape & Reel
		0.4 Pitch	—	AP2121AJ4A-3.0TRG1	—	CH	Tape & Reel
		0.4 Pitch	—	AP2121AJ4A-3.2TRG1	—	DA	Tape & Reel
		0.4 Pitch	—	AP2121AJ4A-3.3TRG1	—	DB	Tape & Reel

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Ordering Information (continued)

Package	Temperature Range	Condition	Part Number		Marking ID		Packing
			Lead Free	Green	Lead Free	Green	
CSP-4	-40 to +85°C	0.5 Pitch	—	AP2121AJ4-1.2TRG1	—	BA	Tape & Reel
		0.5 Pitch	—	AP2121AJ4-1.3TRG1	—	BB	Tape & Reel
		0.5 Pitch	—	AP2121AJ4-1.5TRG1	—	BC	Tape & Reel
		0.5 Pitch	—	AP2121AJ4-1.8TRG1	—	BD	Tape & Reel
		0.5 Pitch	—	AP2121AJ4-2.5TRG1	—	BE	Tape & Reel
		0.5 Pitch	—	AP2121AJ4-2.8TRG1	—	BF	Tape & Reel
		0.5 Pitch	—	AP2121AJ4-2.85TRG1	—	DC	Tape & Reel
		0.5 Pitch	—	AP2121AJ4-3.0TRG1	—	BG	Tape & Reel
		0.5 Pitch	—	AP2121AJ4-3.2TRG1	—	BH	Tape & Reel
		0.5 Pitch	—	AP2121AJ4-3.3TRG1	—	CA	Tape & Reel
CSP-4	-40 to +85°C	0.4 Pitch	—	AP2121AJ4B-1.2TRG1	—	DE	Tape & Reel
		0.4 Pitch	—	AP2121AJ4B-1.3TRG1	—	DF	Tape & Reel
		0.4 Pitch	—	AP2121AJ4B-1.5TRG1	—	DG	Tape & Reel
		0.4 Pitch	—	AP2121AJ4B-1.8TRG1	—	DH	Tape & Reel
		0.4 Pitch	—	AP2121AJ4B-2.5TRG1	—	EA	Tape & Reel
		0.4 Pitch	—	AP2121AJ4B-2.8TRG1	—	EB	Tape & Reel
		0.4 Pitch	—	AP2121AJ4B-2.85TRG1	—	EC	Tape & Reel
		0.4 Pitch	—	AP2121AJ4B-3.0TRG1	—	ED	Tape & Reel
		0.4 Pitch	—	AP2121AJ4B-3.2TRG1	—	EE	Tape & Reel
		0.4 Pitch	—	AP2121AJ4B-3.3TRG1	—	EF	Tape & Reel

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Ordering Information (continued)

Package	Temperature Range	Condition	Part Number		Marking ID		Packing
			Lead Free	Green	Lead Free	Green	
CSP-4	-40 to +85°C	0.5 Pitch	—	AP2121AJ4C-1.2TRG1	—	EG	Tape & Reel
		0.5 Pitch	—	AP2121AJ4C-1.3TRG1	—	EH	Tape & Reel
		0.5 Pitch	—	AP2121AJ4C-1.5TRG1	—	FA	Tape & Reel
		0.5 Pitch	—	AP2121AJ4C-1.8TRG1	—	FB	Tape & Reel
		0.5 Pitch	—	AP2121AJ4C-2.5TRG1	—	FC	Tape & Reel
		0.5 Pitch	—	AP2121AJ4C-2.8TRG1	—	FD	Tape & Reel
		0.5 Pitch	—	AP2121AJ4C-2.85TRG1	—	FE	Tape & Reel
		0.5 Pitch	—	AP2121AJ4C-3.0TRG1	—	FF	Tape & Reel
		0.5 Pitch	—	AP2121AJ4C-3.2TRG1	—	FG	Tape & Reel
		0.5 Pitch	—	AP2121AJ4C-3.3TRG1	—	FH	Tape & Reel

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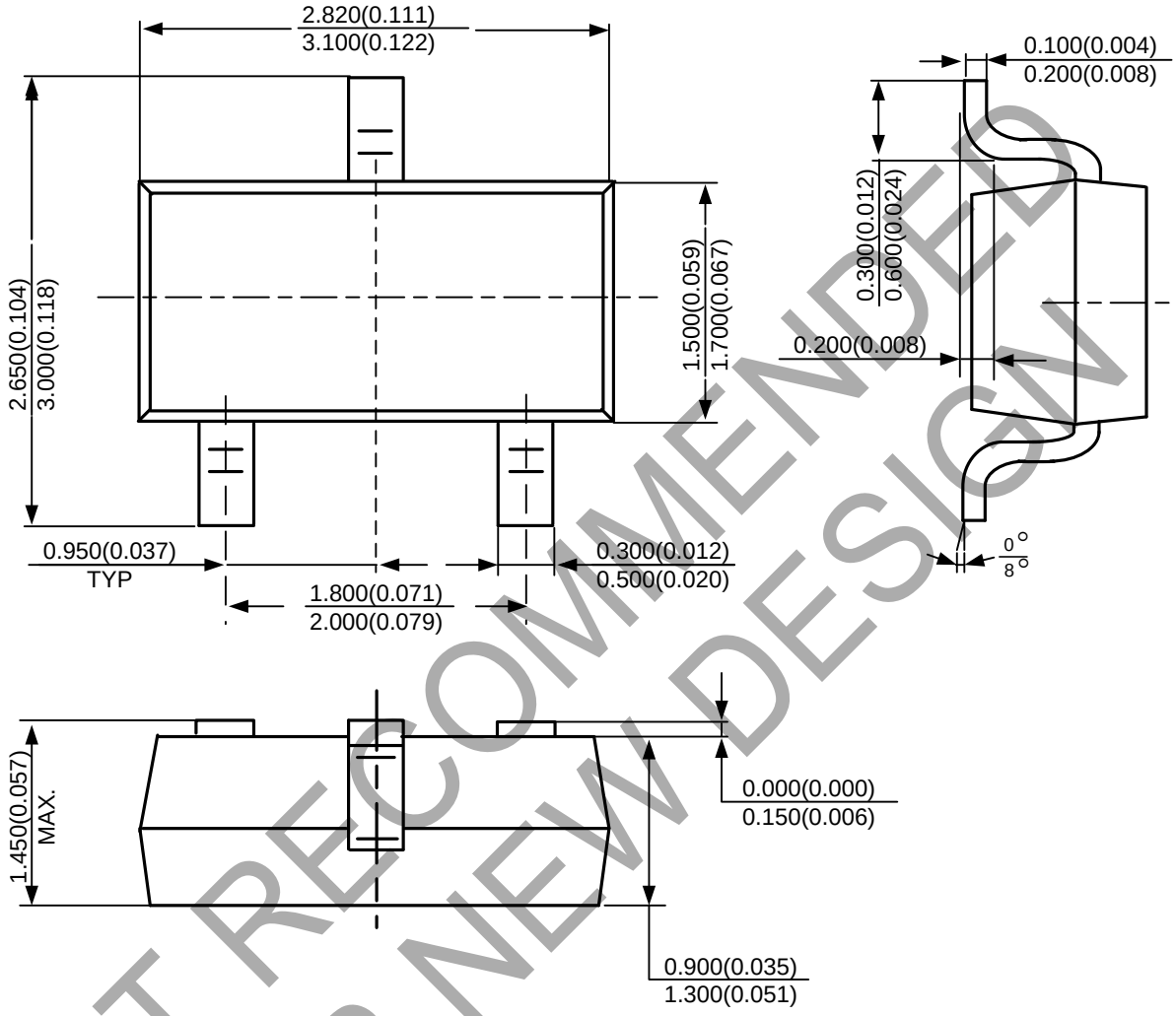
Package Outline Dimensions (All dimensions in mm(inch).)

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

(1) Package Type: SOT-23-3



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

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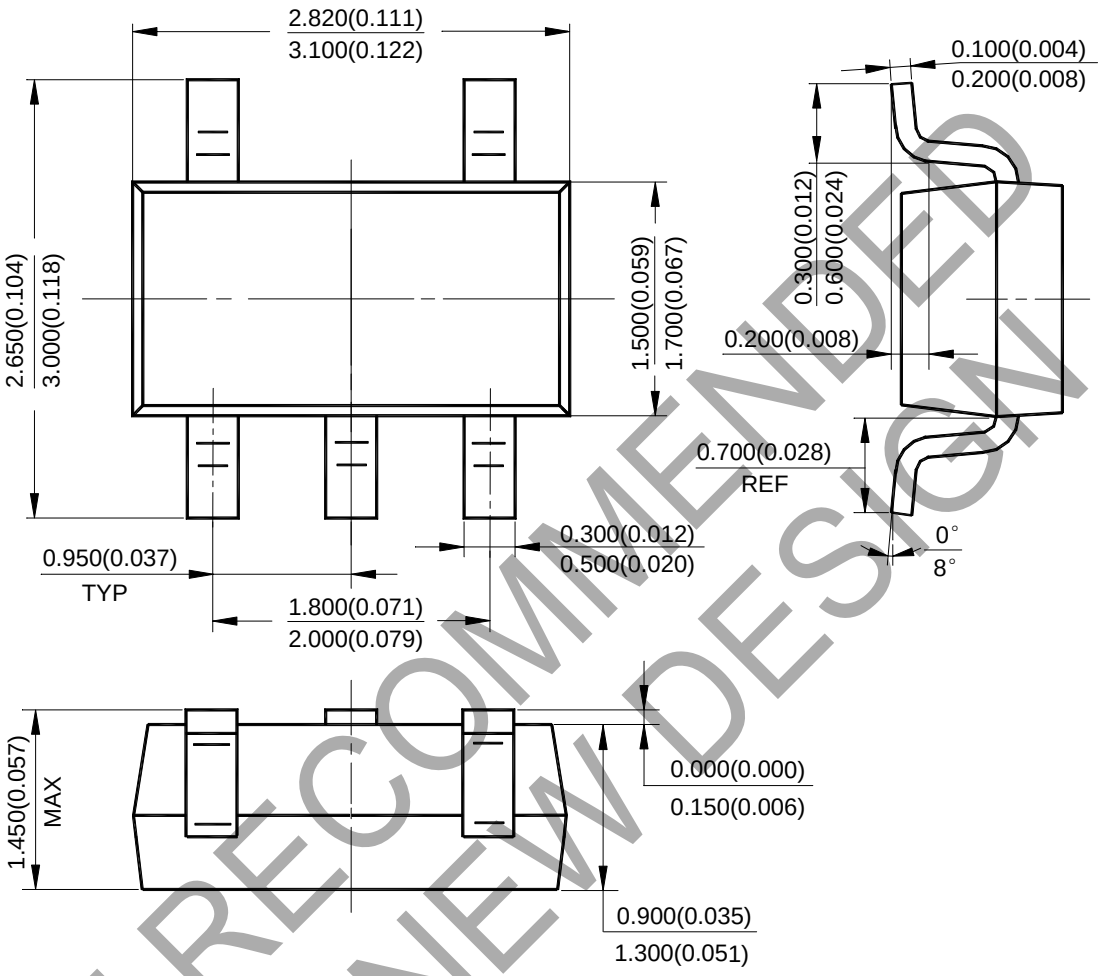
(2) Package Type: SOT-23-5



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

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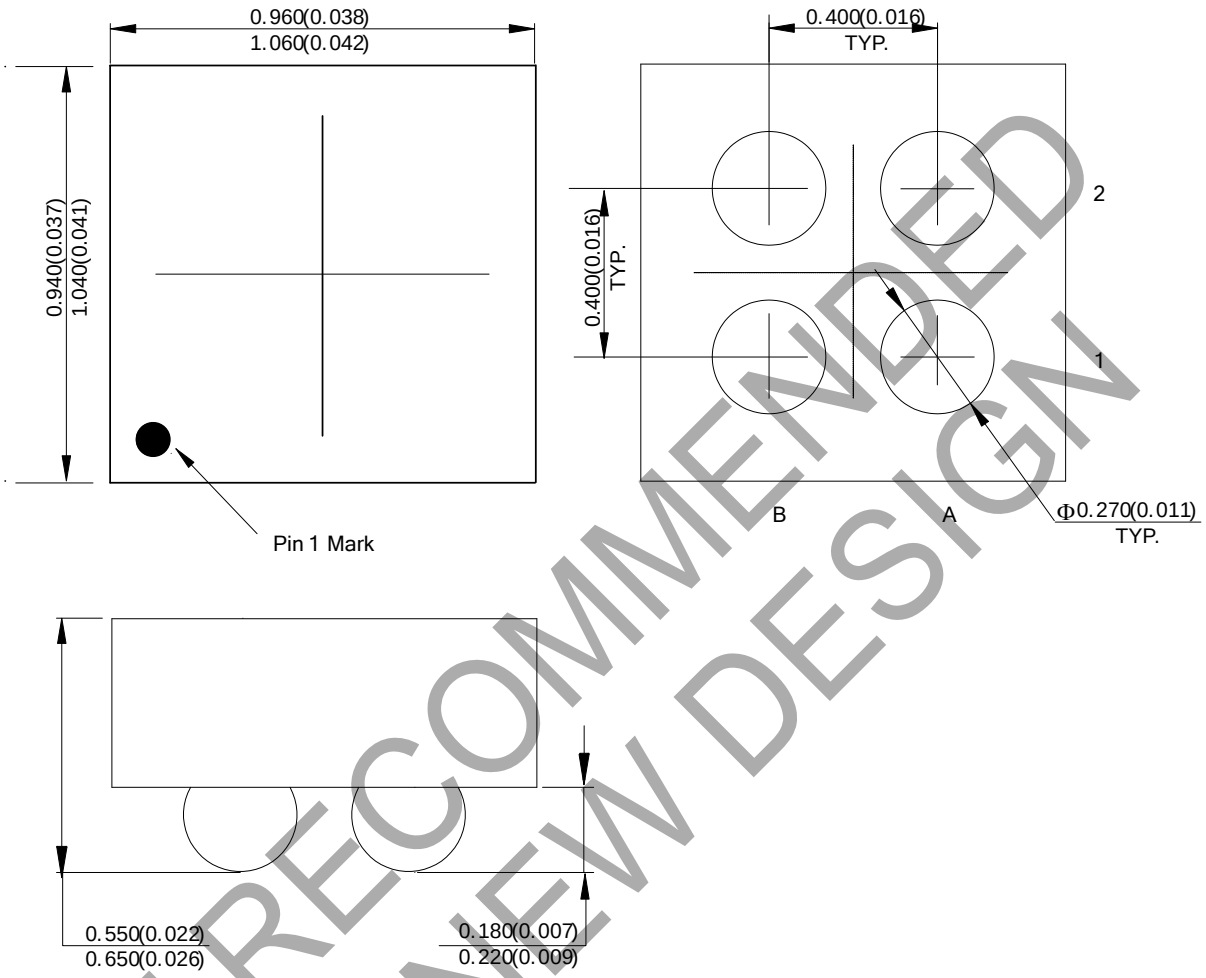
(3) Package Type: CSP-4 (P 0.4)



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

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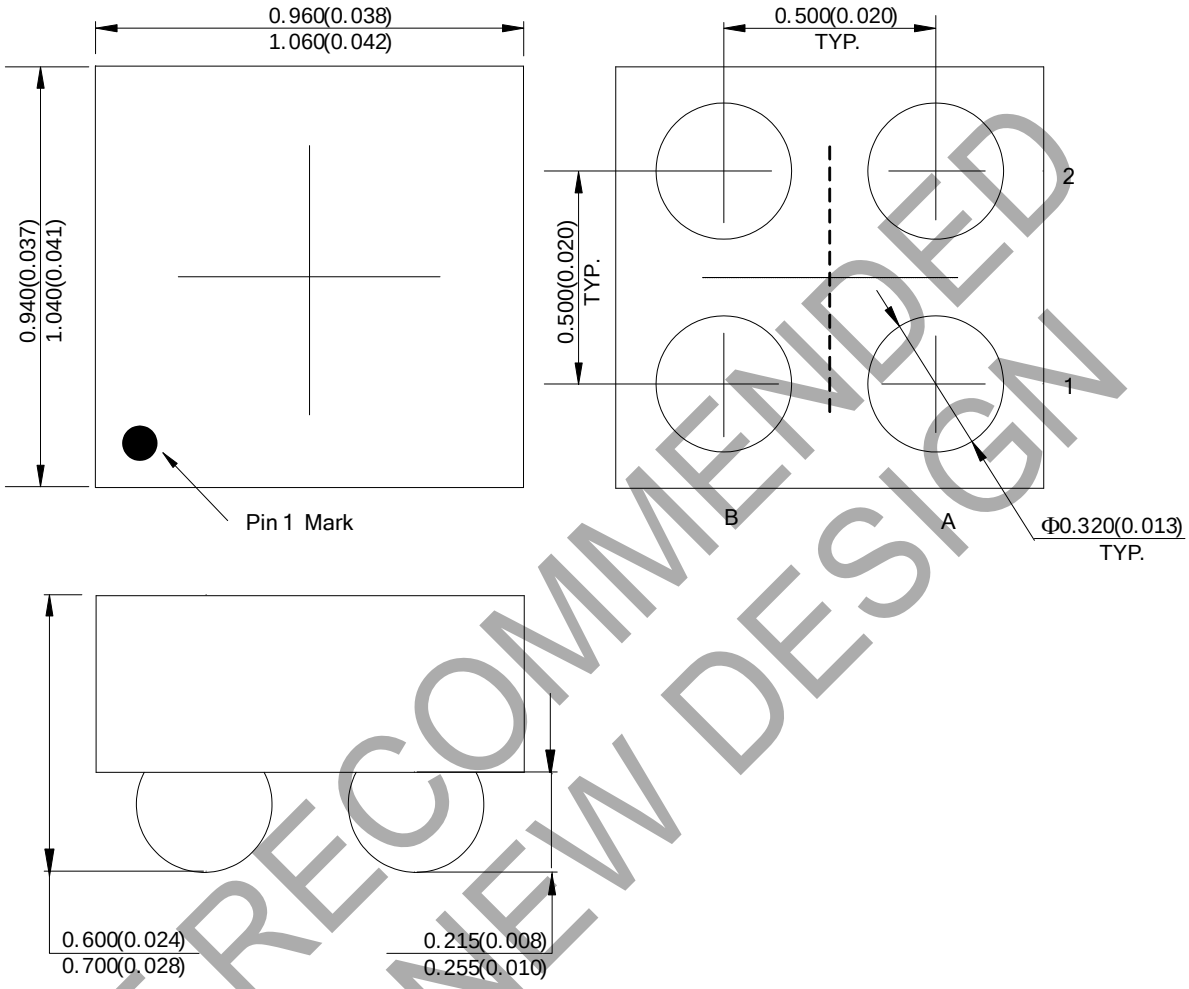
(4) Package Type: CSP-4 (P 0.5)



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Suggested Pad Layout

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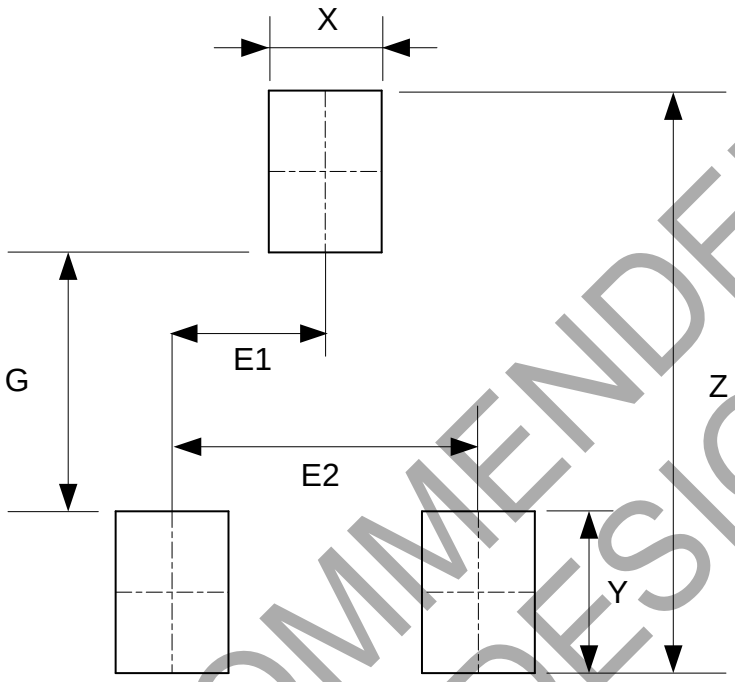
(1) Package Type: SOT-23-3



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

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Suggested Pad Layout (continued)

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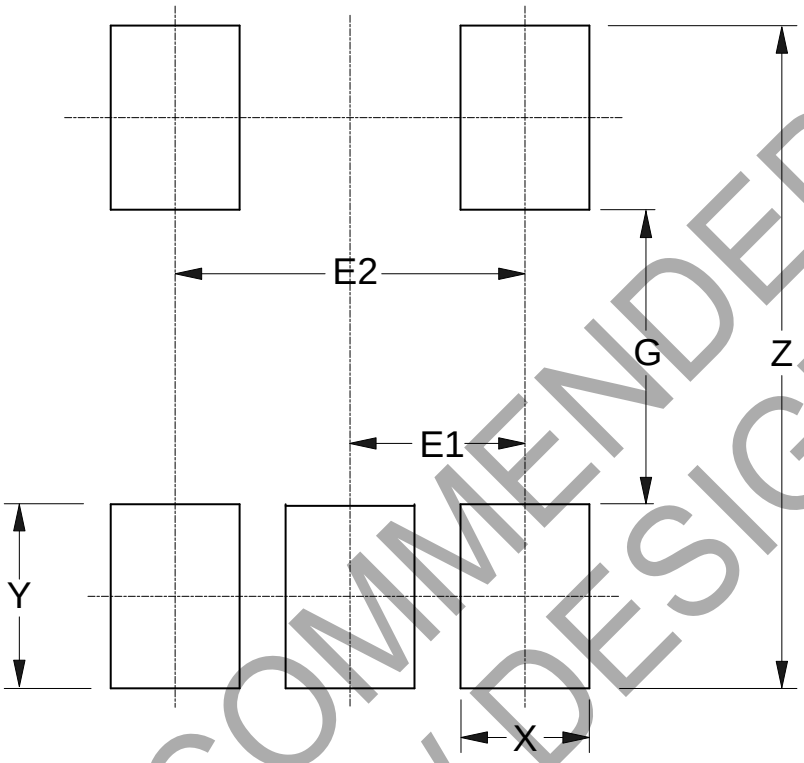
(2) Package Type: SOT-23-5



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

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