Description

The AP2129 is a 300mA, positive Voltage regulator ICs fabricated by CMOS process. The AP2129 provides two kinds of output voltage operation modes for setting the output voltage. Fixed output voltage mode senses the output voltage on V_{OUT}, adjustable output voltage mode needs two resistors as a voltage divider.

The AP2129 series have features of 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 AP2129 has 1.0V, 1.2V, 1.8V, 2.6V, 2.8V, 3.0V and 3.3V fixed voltage version and 0.8V to 4.5V adjustable voltage version.

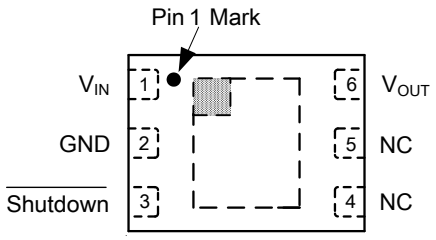
The AP2129 series are available in DFN-1.5x2-6 (1.0V, 1.2V, 1.8V, 2.6V, 2.8V, 3.0V, 3.3V) and SOT-23-5 (1.0V, 1.2V, 3.3V, ADJ) packages.

Features

- Wide Operating Voltage: 1.8V to 6V
- High Output Voltage Accuracy: ±2%
- High Ripple Rejection: 65dB@ f = 1kHz, 45dB@ f = 10kHz
- Low Standby Current: 0.1µA
- Low Quiescent Current: 60µA Typical
- Low Output Noise: 60µVrms
- Short Current Limit: 50mA
- Over Temperature Protection
- Compatible with Low ESR Ceramic Capacitor: 1µF for C_{IN} and C_{OUT}
- Excellent Line/Load Regulation
- Soft Start Time: 50µs
- Auto Discharge Resistance: $R_{DS(ON)}$ = 60Ω

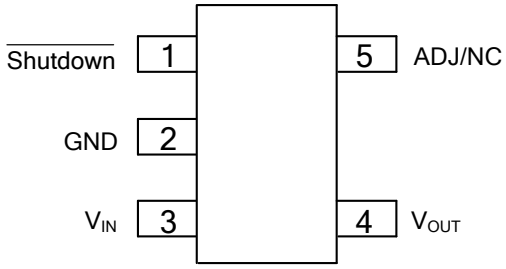
Pin Assignments

(Top View)



DFN-1.5x2-6

(Top View)



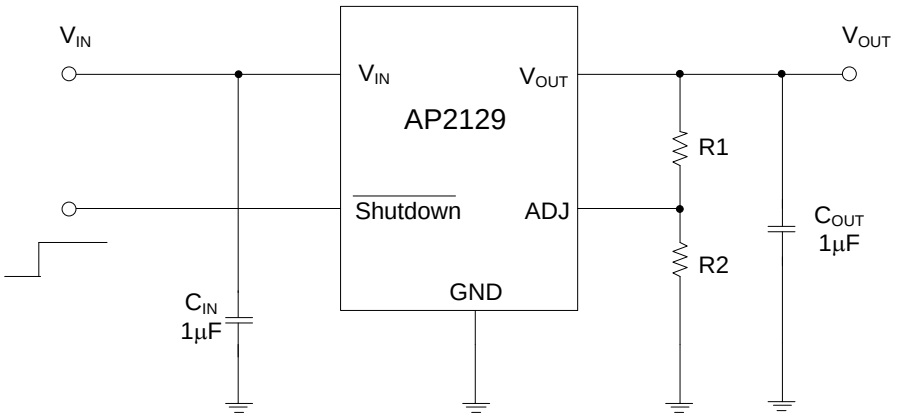
SOT-23-5

Applications

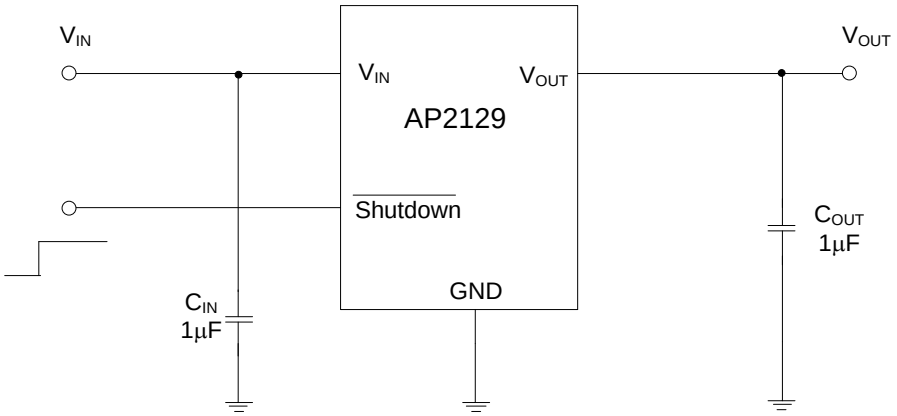
- Datacom
- Notebook Computers
- Mother Board

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Typical Applications Circuit



V_{OUT}=0.8*(1+R1/R2)V



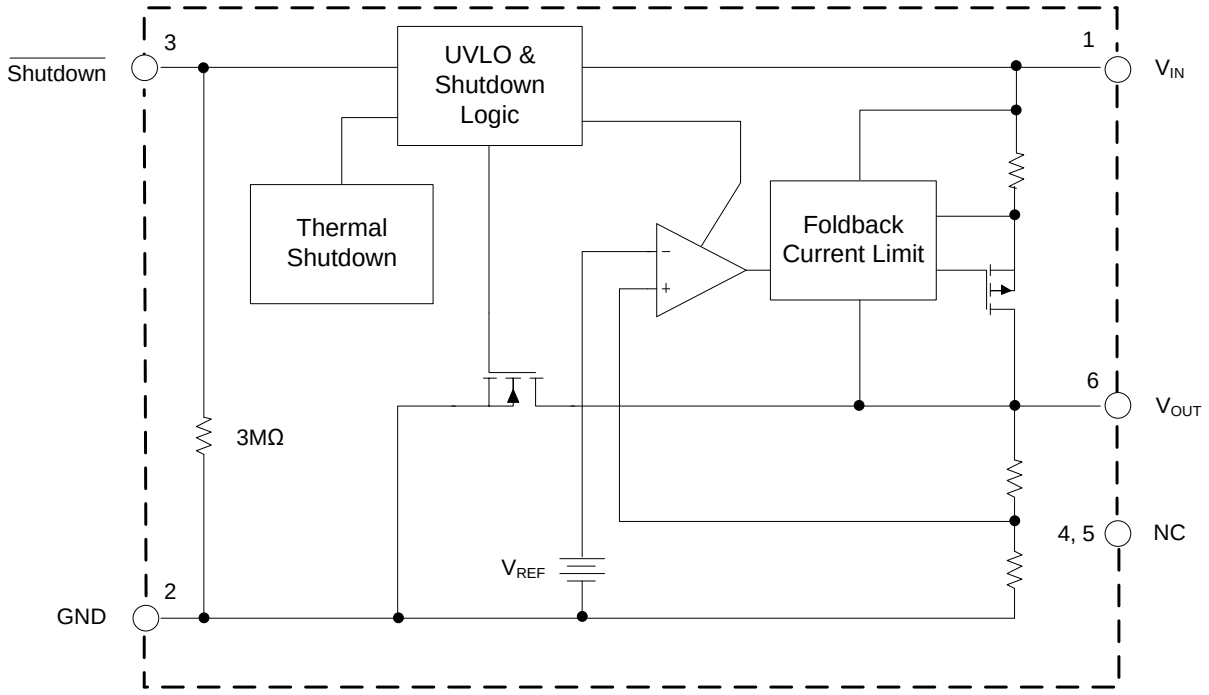
V_{OUT}=1.0V, 1.2V, 1.8V, 2.6V, 2.8V, 3.0V, 3.3V

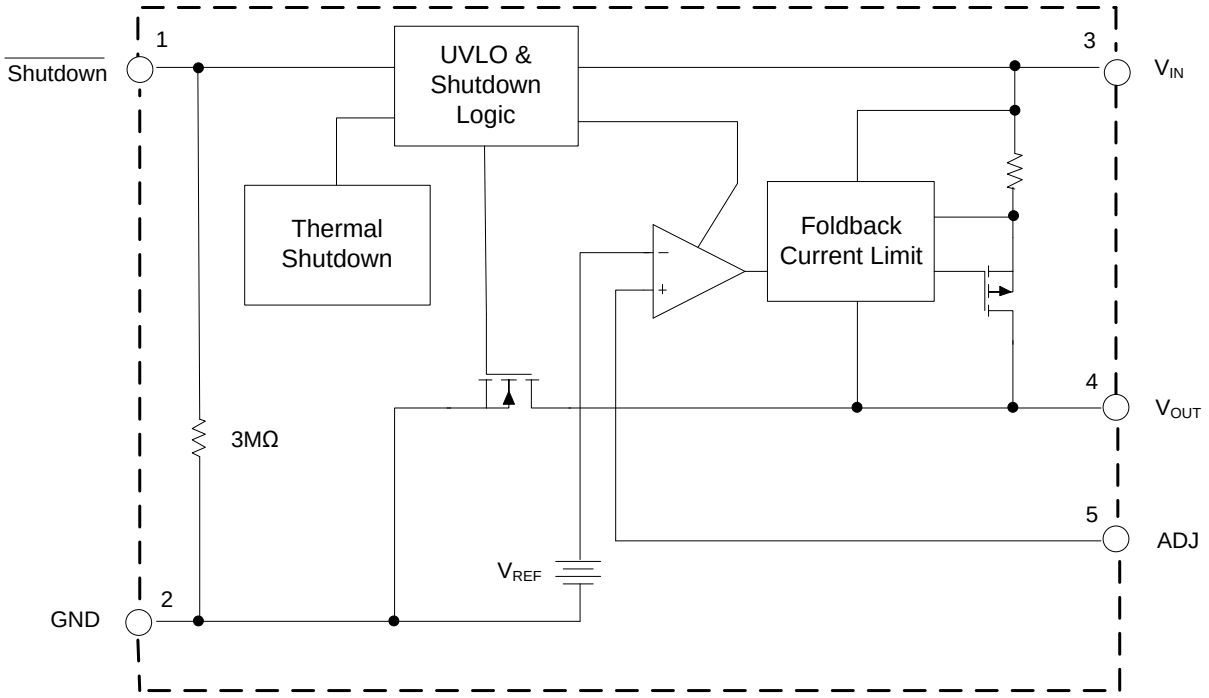
Pin Descriptions

Pin Number		Pin Name	Function
DFN-1.5x2-6	SOT-23-5		
1	3	V_{IN}	Input Voltage
2	2	GND	Ground
3	1	$\overline{\text{Shutdown}}$	Active High Enable Input Pin. Logic high=enable, logic low=shutdown
4, 5	—	NC	No Connection
—	5	ADJ/NC	Adjust Output for ADJ version/ No Connection for Fixed Version
6	4	V_{OUT}	Regulated Output Voltage

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Functional Block Diagram





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Absolute Maximum Ratings (Note 1)

Symbol	Parameter	Rating		Unit
V_{IN}	Input Voltage	6.5		V
V_{CE}	Shutdown Input Voltage	-0.3 to V_{IN} +0.3		V
I_{OUT}	Output Current	450		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)	DFN-1.5x2-6	100	°C/W
		SOT-23-5	250	
ESD	ESD (Human Body Model)	6000		V
ESD	ESD (Machine Model)	200		V

Note 1: Stresses greater than those listed under “Absolute Maximum Ratings” 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 Ratings” for extended periods may affect device reliability.

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{IN}	Input Voltage	1.8	6	V
T_A	Operating Ambient Temperature Range	-40	+85	°C

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Electrical Characteristics

AP2129-1.0/1.2/1.8/2.6/2.8/3.0/3.3 Electrical Characteristics (@C_{IN} =1μF, C_{OUT} = 1μF, **Bold** type applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	V_{IN} = V_{OUT} +1V, (Note 2) 1mA ≤ I_{OUT} ≤ 300mA	98%* V_{OUT}	—	102%* V_{OUT}	V
V_{IN}	Input Voltage	—	1.8	—	6	V
$I_{OUT(MAX)}$	Maximum Output Current	—	—	450	—	mA
$\Delta V_{OUT}/(\Delta I_{OUT}*V_{OUT})$	Load Regulation	V_{IN}-V_{OUT} = 1V, (Note 2), 1mA ≤ I_{OUT} ≤ 300mA	—	—	1.5	%/A
ΔV_{OUT} /(ΔV_{IN}*V_{OUT})	Line Regulation	V_{OUT} +0.5V ≤ V_{IN} ≤ 6V, (Note 2), I_{OUT} = 30mA	—	—	0.06	%/V
V_{DROP}	Dropout Voltage	V_{OUT} = 1.0V, I_{OUT} = 300mA	—	800	—	mV
		V_{OUT} = 1.2V, I_{OUT} = 300mA	—	600	—	
		V_{OUT} = 1.8V, I_{OUT} = 300mA	—	600	700	
		V_{OUT} = 2.6V/2.8V/3.0V/3.3V, I_{OUT} = 300mA	—	170	300	
I_Q	Quiescent Current	V_{IN} = V_{OUT} +1V, I_{OUT} = 0mA	—	60	90	μA
I_{STD}	Standby Current	V_{IN} = V_{OUT} +1V, $V_{\overline{Shutdown}}$ in off mode	—	0.1	1.0	μA
PSRR	Power Supply Rejection Ratio	Ripple 1Vp-p, V_{IN} = V_{OUT} +1V, f = 100Hz	—	65	—	dB
		f = 1kHz	—	65	—	dB
		f = 10kHz	—	45	—	dB
($\Delta V_{OUT}/V_{OUT}$) /ΔT	Output Voltage Temperature Coefficient	I_{OUT} = 30mA, -40°C ≤ T_J ≤ +85°C	—	**±100**	—	ppm/°C
I_{LIMIT}	Output Current Limit	V_{IN}-V_{OUT} = 1V, V_{OUT} = 0.98*V_{OUT}	—	400	—	mA
I_{SHORT}	Short Current Limit	V_{OUT} = 0V	—	50	—	mA
t_{UP}	Soft Start Time	—	—	50	—	μs
V_{NOISE}	RMS Output Noise	T_A = +25°C, 10Hz ≤ f ≤ 100kHz	—	60	—	μVrms
—	$\overline{Shutdown}$ "High" Voltage	$\overline{Shutdown}$ Input Voltage "High"	1.5	—	6	V
—	$\overline{Shutdown}$ "Low" Voltage	$\overline{Shutdown}$ Input Voltage "Low"	0	—	0.4	V
—	V_{OUT} Discharge MOSFET $R_{DS(ON)}$	$\overline{Shutdown}$ Input Voltage "Low"	—	60	—	Ω
—	$\overline{Shutdown}$ Pull Down Resistance	—	—	3	—	MΩ
—	Thermal Shutdown	—	—	+165	—	°C
—	Thermal Shutdown Hysteresis	—	—	+30	—	°C
θ_{JC}	Thermal Resistance	DFN-1.5x2-6	—	20	—	°C/W
		SOT-23-5	—	150	—	

Note 2: V_{IN} = 2.8V for 1.0 and 1.2 version.

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Electrical Characteristics (Cont.)

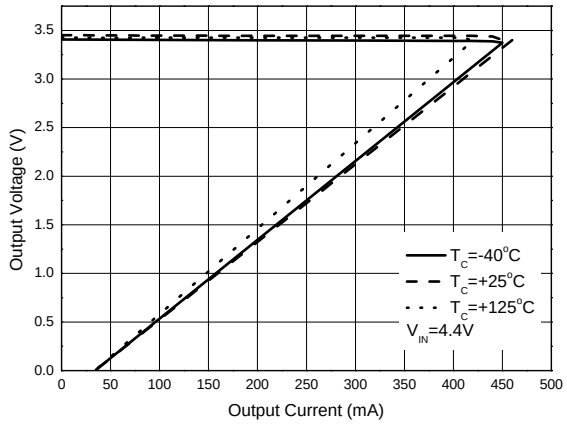
AP2129-ADJ Electrical Characteristics (@C_{IN} =1µF, C_{OUT} = 1µF, **Bold** type applies over -40°C ≤ T_J ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{REF}	Reference Voltage	V_{IN} = 1.8V 1mA ≤ I_{OUT} ≤ 300mA		0.748	0.8	0.816	V
V_{IN}	Input Voltage	—		1.8	—	6	V
$I_{OUT(MAX)}$	Maximum Output Current	—		—	450	—	mA
$\Delta V_{OUT}/(\Delta I_{OUT}*V_{OUT})$	Load Regulation	V_{IN}-V_{OUT} = 1V, 1mA ≤ I_{OUT} ≤ 300mA		—	—	1.5	%/A
ΔV_{OUT} /(ΔV_{IN}*V_{OUT})	Line Regulation	V_{OUT} +0.5V ≤ V_{IN} ≤ 6V, I_{OUT} = 30mA		—	—	0.06	%/V
I_Q	Quiescent Current	V_{IN} = V_{OUT} +1V, I_{OUT} = 0mA		—	60	90	µA
I_{STD}	Standby Current	V_{IN} = V_{OUT} +1V, $V_{\overline{Shutdown}}$ in off mode		—	0.1	1.0	µA
PSRR	Power Supply Rejection Ratio	Ripple 1Vp-p, V_{IN} = V_{OUT} +1V	f = 100Hz	—	65	—	dB
			f = 1kHz	—	65	—	dB
			f = 10kHz	—	45	—	dB
($\Delta V_{OUT}/V_{OUT}$) /ΔT	Output Voltage Temperature Coefficient	I_{OUT} = 30mA, -40°C ≤ T_J ≤ +85°C		—	**±100**	—	ppm/°C
I_{LIMIT}	Output Current Limit	—		—	400	—	mA
I_{SHORT}	Short Current Limit	V_{OUT} = 0V		—	50	—	mA
t_{UP}	Soft Start Time	—		—	50	—	µs
V_{NOISE}	RMS Output Noise	T_A = +25°C, 10Hz ≤ f ≤ 100kHz		—	60	—	µVrms
—	$\overline{Shutdown}$ "High" Voltage	$\overline{Shutdown}$ Input Voltage "High"		1.5	—	6	V
—	$\overline{Shutdown}$ "Low" Voltage	$\overline{Shutdown}$ Input Voltage "Low"		0	—	0.4	V
—	V_{OUT} Discharge MOSFET $R_{DS(ON)}$	$\overline{Shutdown}$ Input Voltage "Low"		—	60	—	Ω
—	$\overline{Shutdown}$ Pull Down Resistance	—		—	3	—	MΩ
—	Thermal Shutdown	—		—	+165	—	°C
—	Thermal Shutdown Hysteresis	—		—	+30	—	°C
θ_{JC}	Thermal Resistance	DFN-1.5x2-6		—	20	—	°C/W
		SOT-23-5		—	150	—	

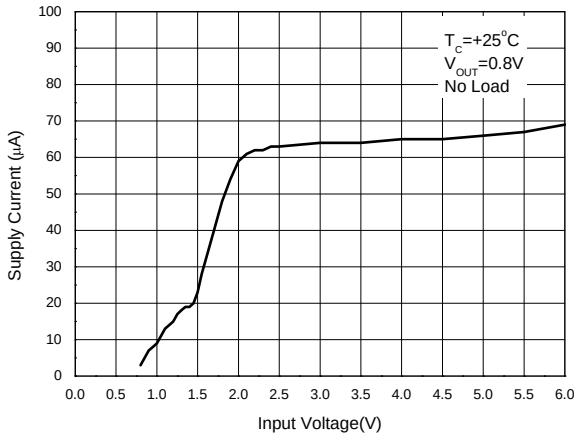
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Performance Characteristics

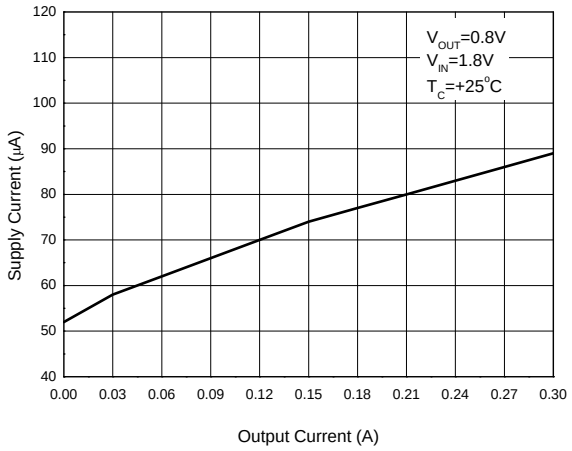
Output Voltage vs. Output Current



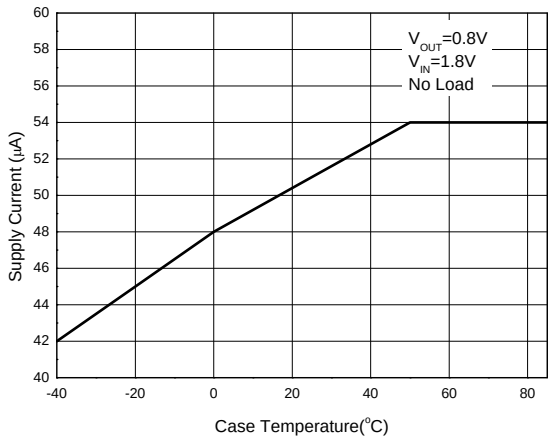
Supply Current vs. Input Voltage



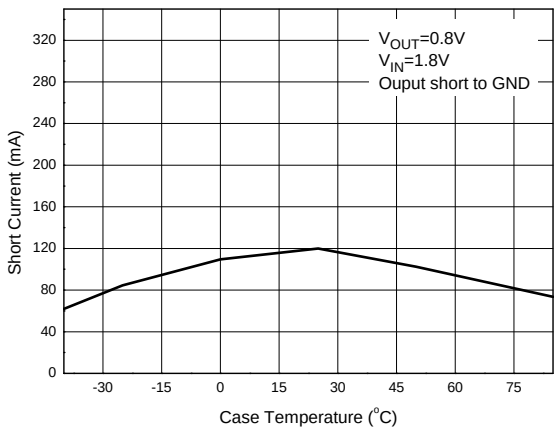
Supply Current vs. Output Current



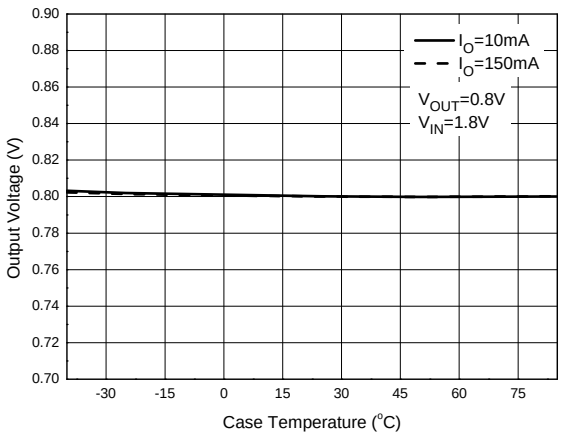
Supply Current vs. Case Temperature



Short Current vs. Case Temperature



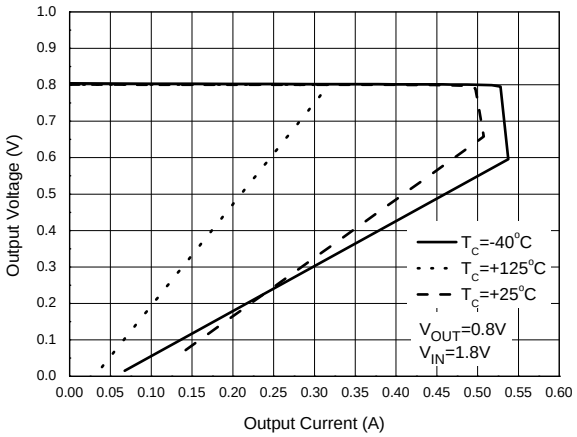
Output Voltage vs. Case Temperature



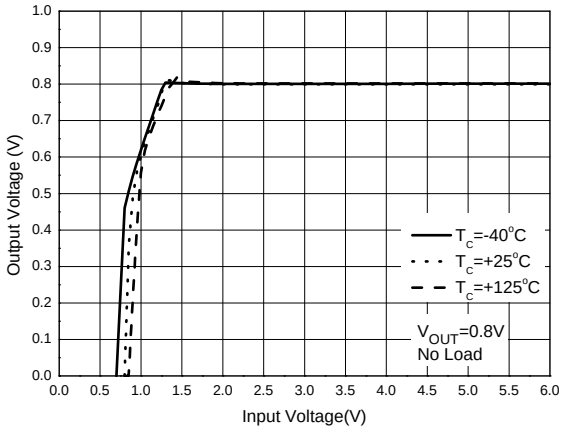
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Performance Characteristics (Cont.)

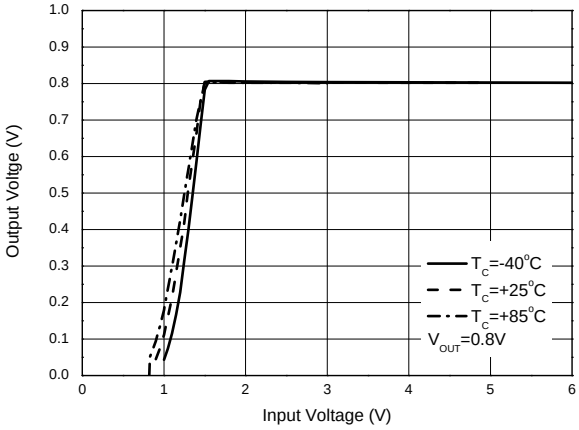
Output Voltage vs. Output Current



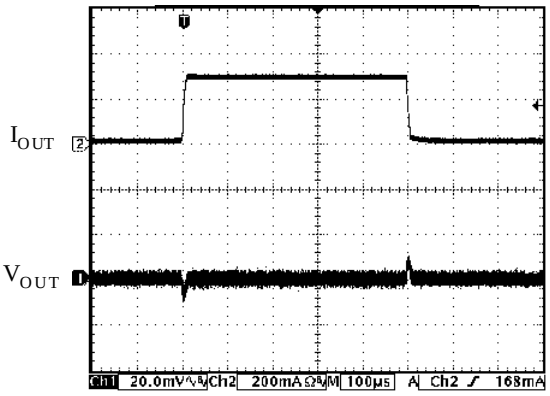
Output Voltage vs. Input Voltage



Output Voltage vs. Input Voltage (I_{OUT}=300mA)



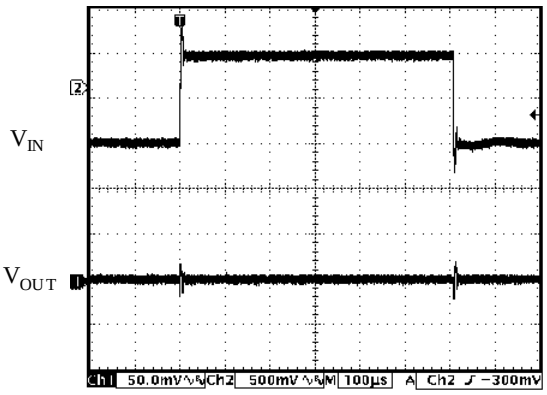
Load Transient
(Conditions: C_{IN}=C_{OUT}=1µF, V_{IN}=2.5V, V_{OUT}=0.8V)



Load Transient
(Conditions: C_{IN}=C_{OUT}=1µF, V_{IN}=4.4V, V_{OUT}=3.3V)



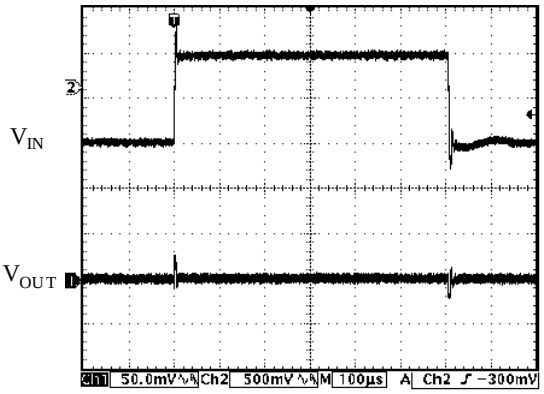
Line Transient
(Conditions: I_{OUT}=30mA, C_{IN}=C_{OUT}=1µF, V_{IN}=2.5 to 3.5V, V_{OUT}=0.8V)



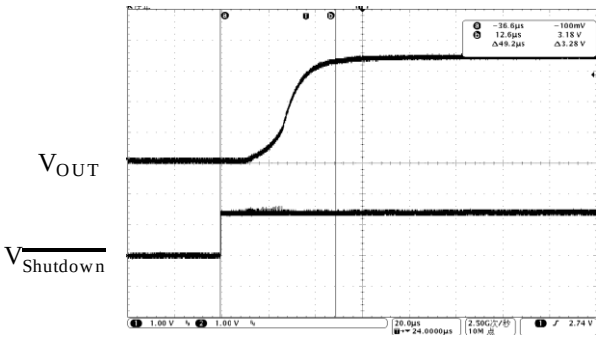
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Performance Characteristics (Cont.)

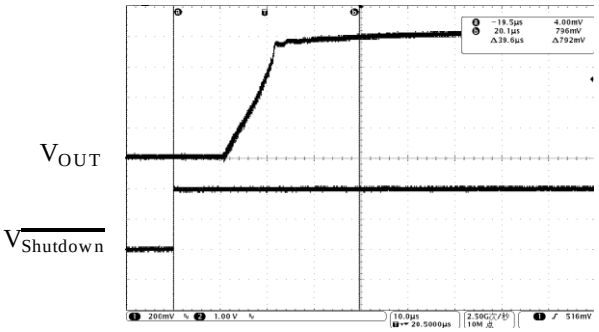
Line Transient
(Conditions: I_{OUT}=30mA, C_{IN}=C_{OUT}=1μF, V_{IN}=4 to 5V, V_{OUT}=3.3V)



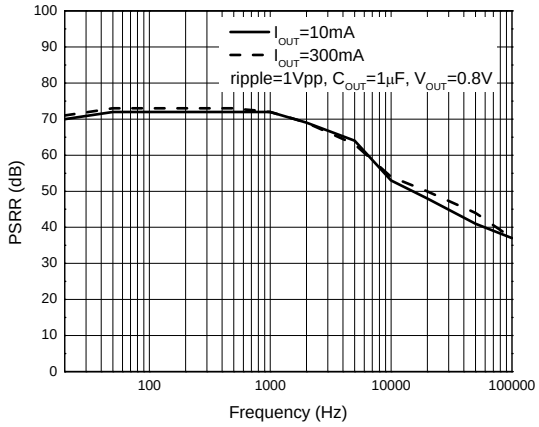
Soft Start Time
(Conditions: I_{OUT}=0mA, C_{IN}=C_{OUT}=1μF, $V_{\overline{Shutdown}}$=0 to 2V, V_{OUT}=3.3V)



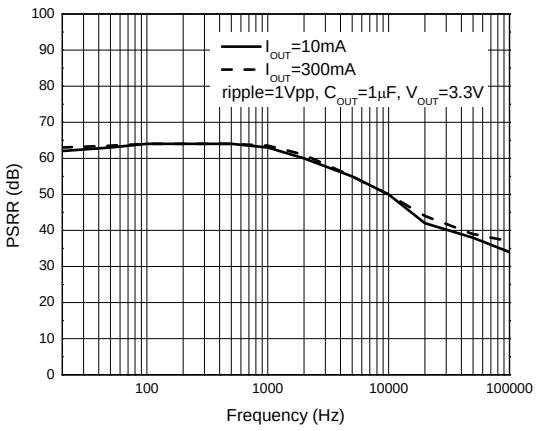
Soft Start Time
(Conditions: I_{OUT}=0mA, C_{IN}=C_{OUT}=1μF, $V_{\overline{Shutdown}}$=0 to 2V, V_{OUT}=0.8V)



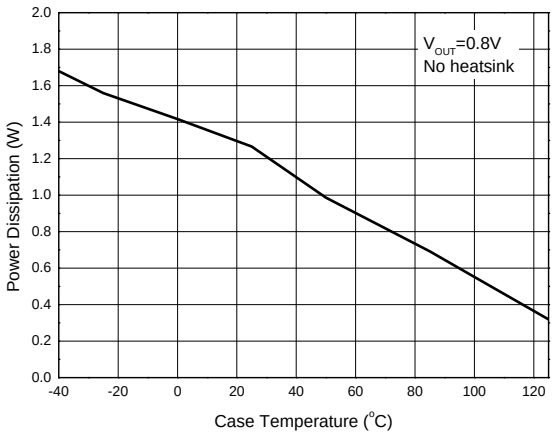
PSRR vs. Frequency



PSRR vs. Frequency

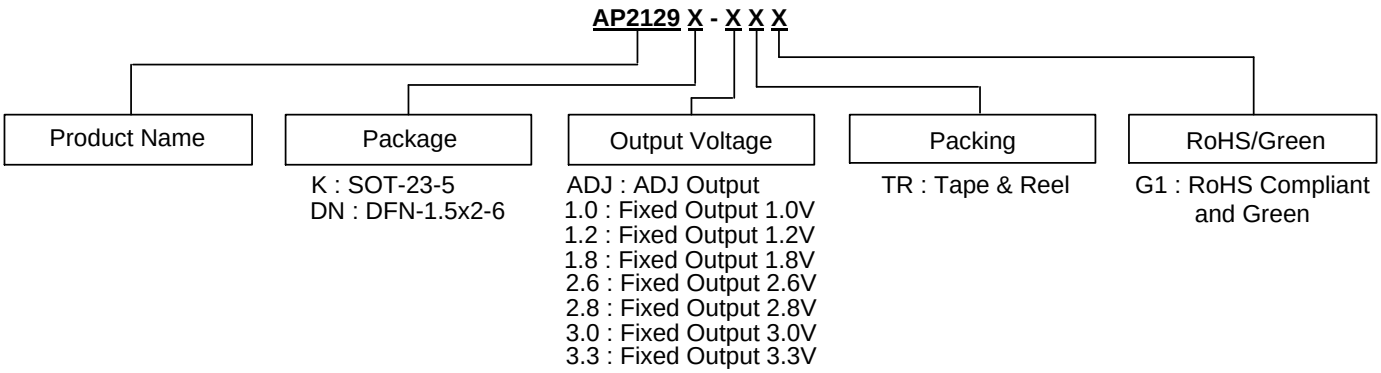


Power Dissipation vs. Case Temperature



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Ordering Information

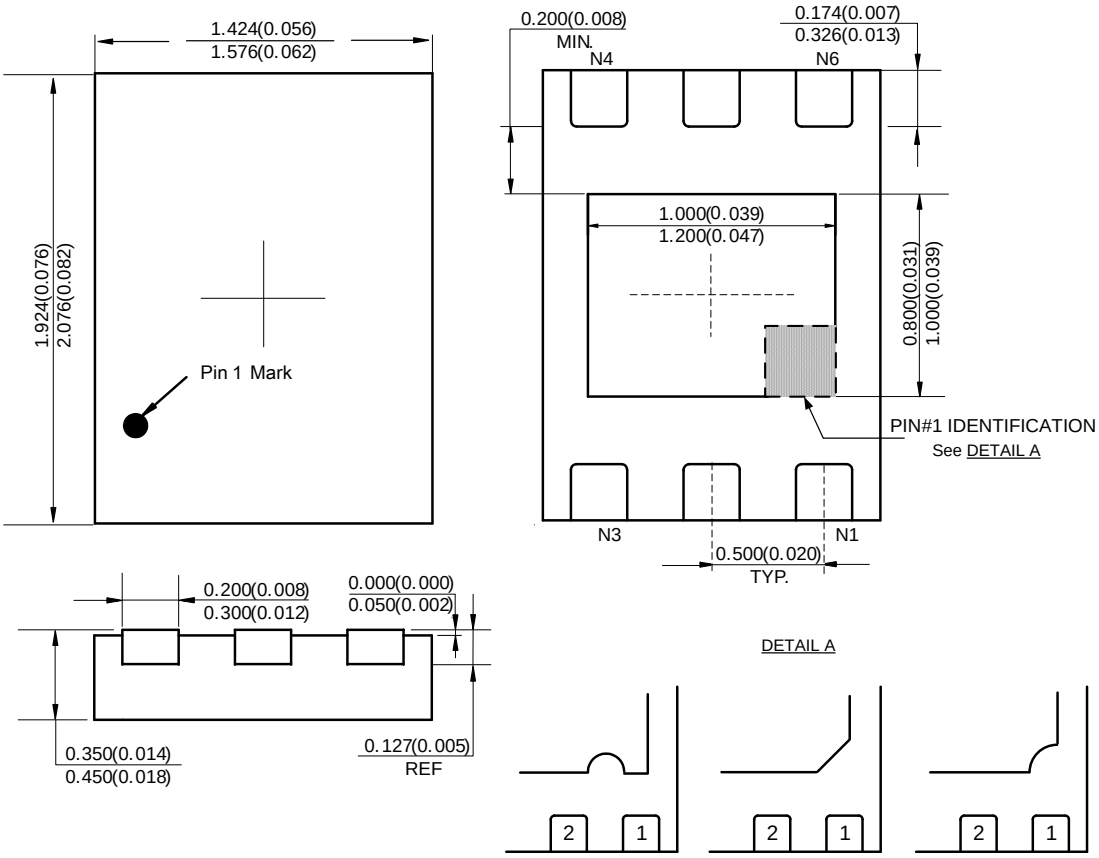


Package	Temperature Range	Part Number	Marking ID	Packing
SOT-23-5	-40 to +85°C	AP2129K- ADJTRG1	GEJ	Tape & Reel
		AP2129K-1.0TRG1	GEK	Tape & Reel
		AP2129K-1.2TRG1	GEL	Tape & Reel
		AP2129K-3.3TRG1	GEM	Tape & Reel
DFN-1.5x2-6	-40 to +85°C	AP2129DN-1.0TRG1	LA	Tape & Reel
		AP2129DN-1.2TRG1	MA	Tape & Reel
		AP2129DN-1.8TRG1	LB	Tape & Reel
		AP2129DN-2.6TRG1	MB	Tape & Reel
		AP2129DN-2.8TRG1	LC	Tape & Reel
		AP2129DN-3.0TRG1	MC	Tape & Reel
		AP2129DN-3.3TRG1	LD	Tape & Reel

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

(1) Package Type: DFN-1.5x2-6

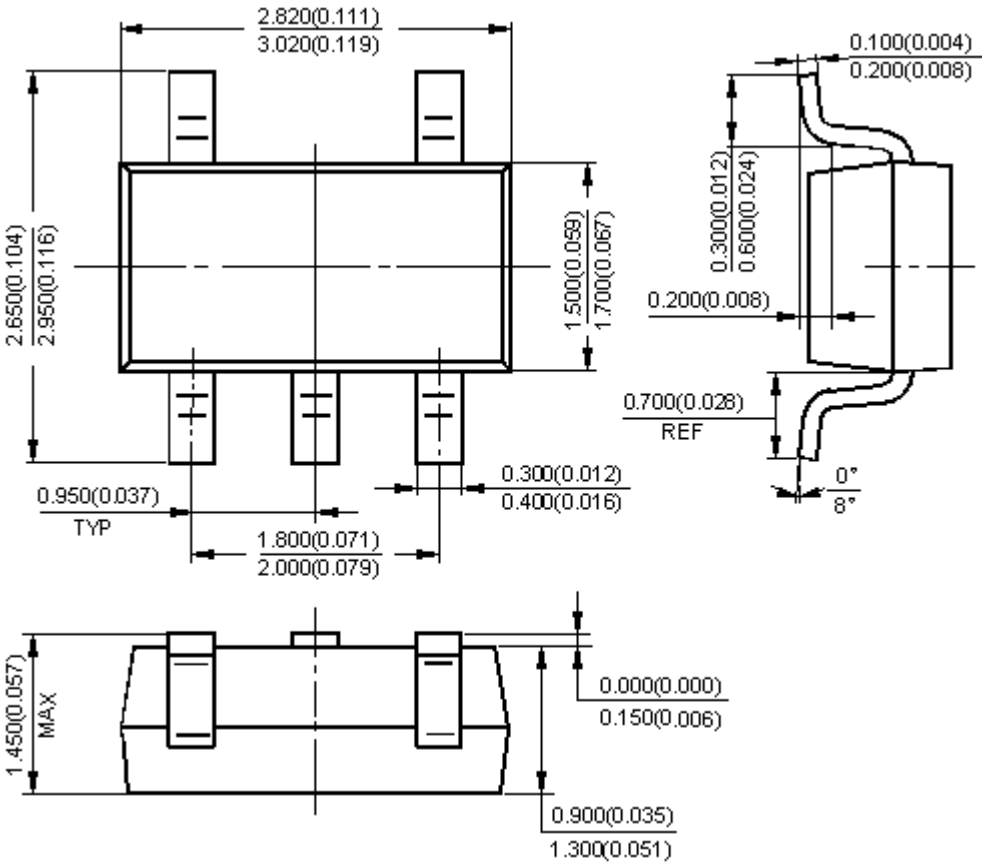


Pin 1 options

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

(2) Package Type: SOT-23-5



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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.

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Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

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Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

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Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

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