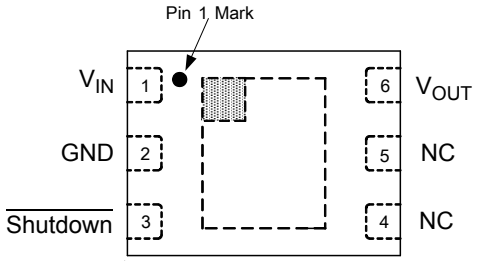
Pin Configuration

DN Package
(DFN-1.5x2-6)



K Package
(SOT-23-5)

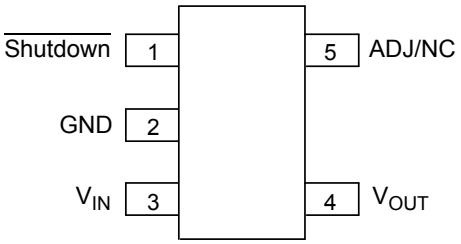
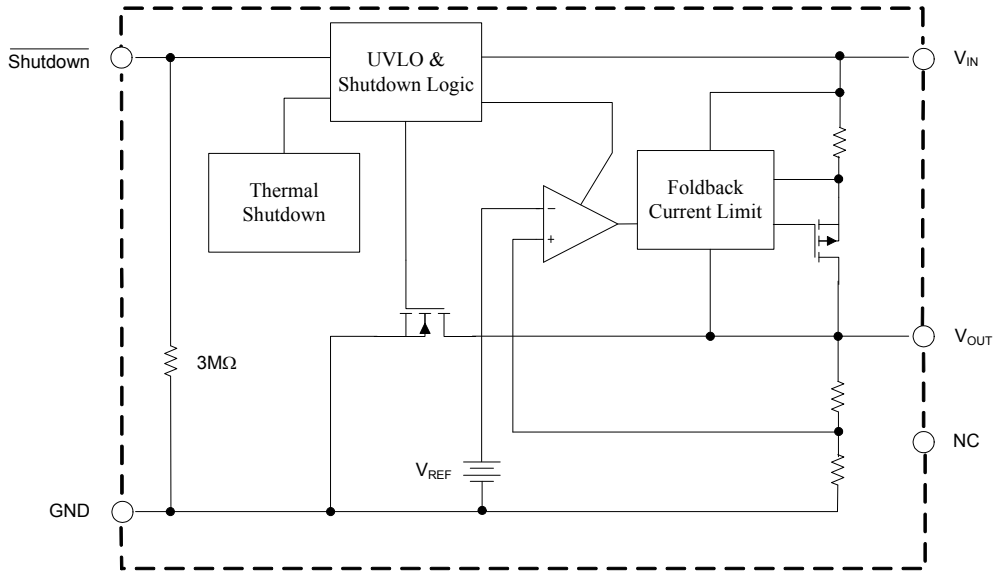


Figure 2. Pin Configuration of AP2129 (Top View)

Pin Description

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=shut-down
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

Functional Block Diagram



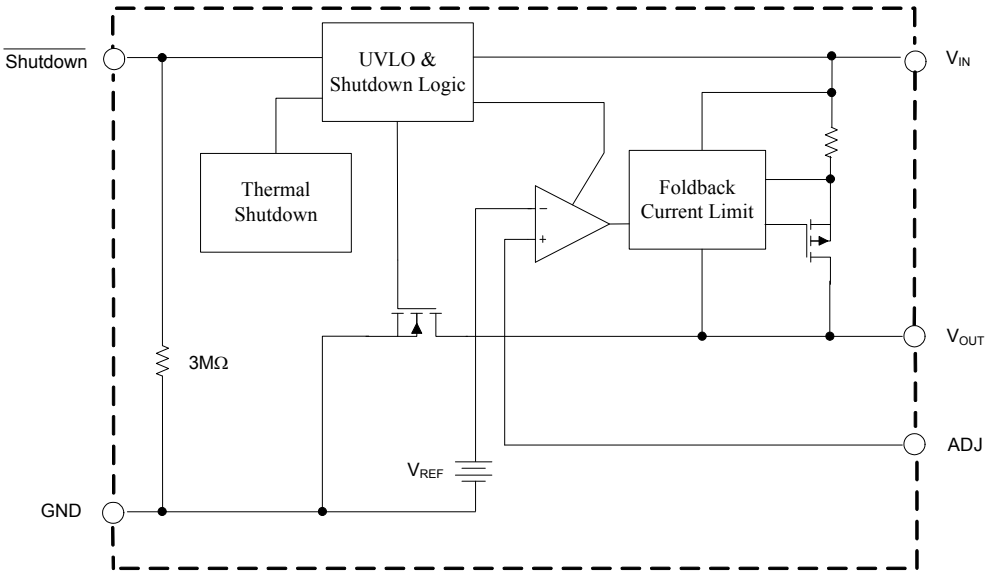
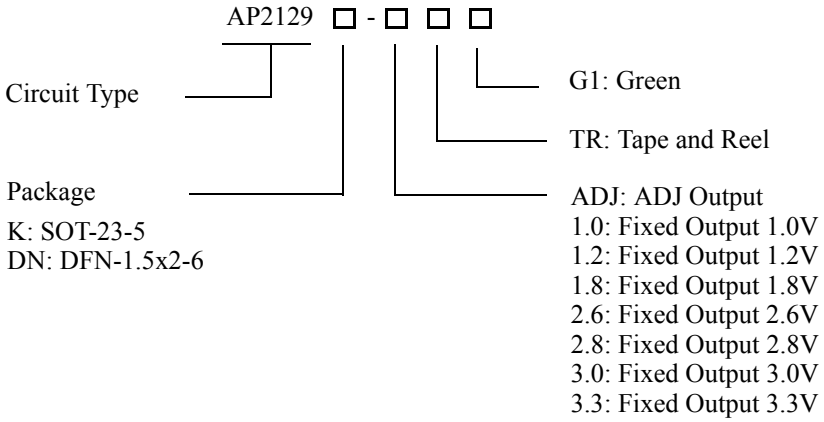


Figure 3. Functional Block Diagram of AP2129

Ordering Information



Package	Temperature Range	Part Number	Marking ID	Packing Type
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

BCD Semiconductor's products, as designated with "G1" suffix in the part number, are RoHS compliant and Green.

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value		Unit
Input Voltage	V_{IN}	6.5		V
Shutdown Input Voltage	V_{CE}	-0.3 to V_{IN}+0.3		V
Output Current	I_{OUT}	450		mA
Junction Temperature	T_J	150		°C
Storage Temperature Range	T_{STG}	-65 to 150		°C
Lead Temperature (Soldering, 10sec)	T_{LEAD}	260		°C
Thermal Resistance (Junction to Ambient)	θ_{JA}	DFN-1.5x2-6	100	°C/W
		SOT-23-5	250	
ESD (Human Body Model)	ESD	6000		V
ESD (Machine Model)	ESD	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

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

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 typeface applies over -40°C≤T_J≤85°C, unless otherwise specified.

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

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

Electrical Characteristics (Continued)

AP2129-ADJ Electrical Characteristics

(C_{IN}=1μF, C_{OUT}=1μF, Bold typeface applies over -40°C≤T_J≤85°C, unless otherwise specified.)

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

Typical Performance Characteristics

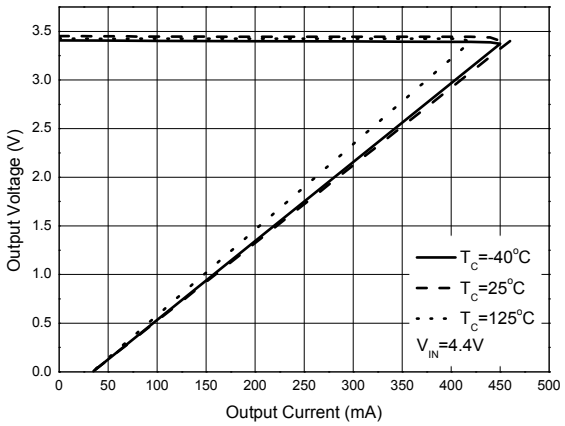


Figure 4. Output Voltage vs. Output Current

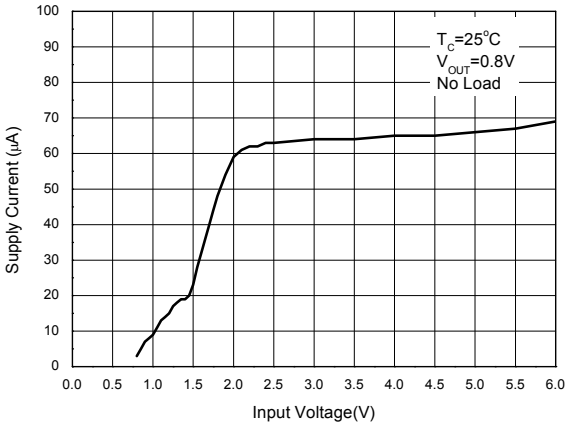


Figure 5. Supply Current vs. Input Voltage

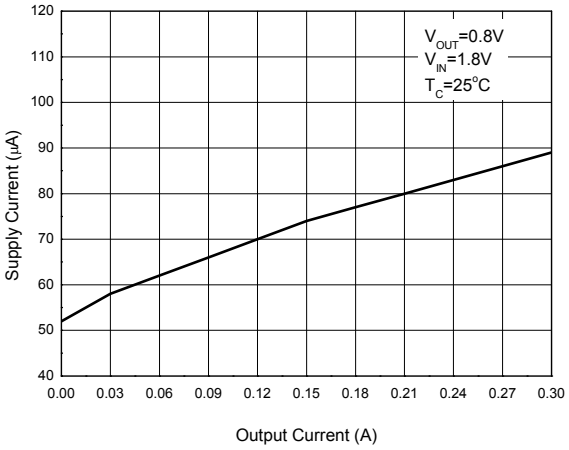


Figure 6. Supply Current vs. Output Current

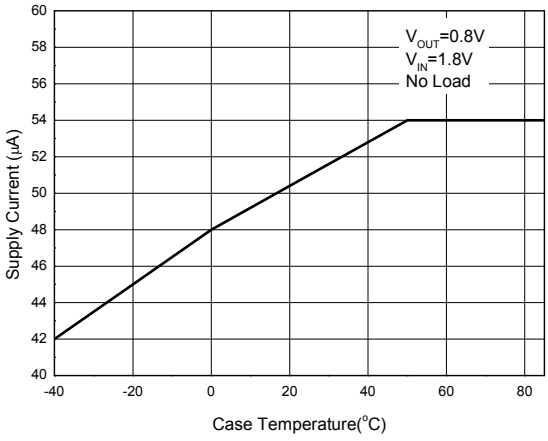


Figure 7. Supply Current vs. Case Temperature

Typical Performance Characteristics (Continued)

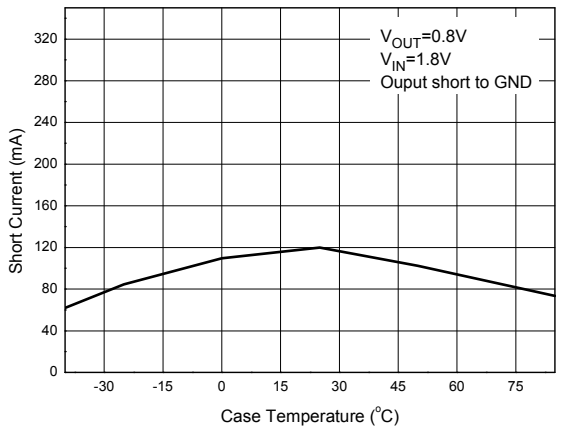


Figure 8. Short Current vs. Case Temperature

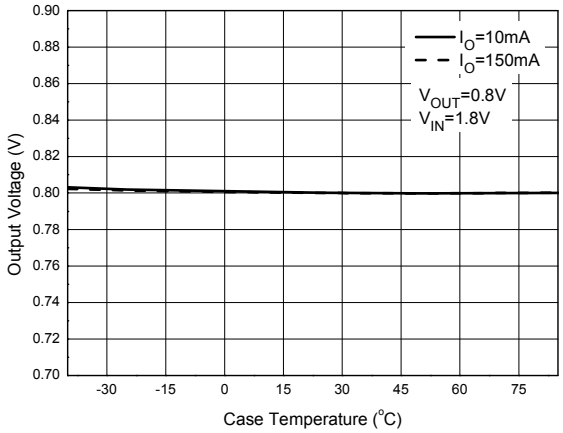


Figure 9. Output Voltage vs. Case Temperature

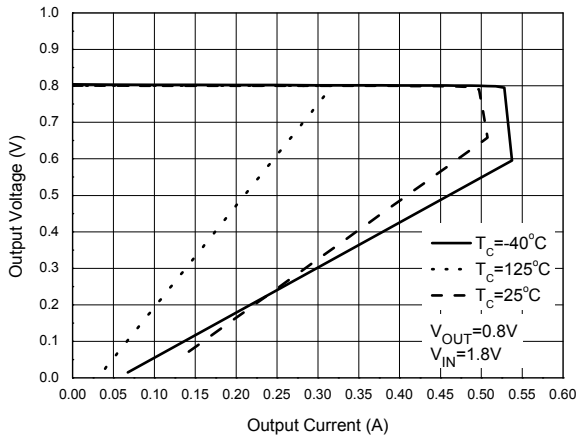


Figure 10. Output Voltage vs. Output Current

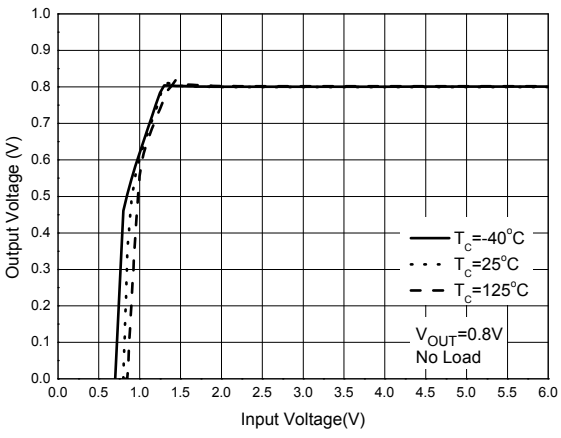


Figure 11. Output Voltage vs. Input Voltage

Typical Performance Characteristics (Continued)

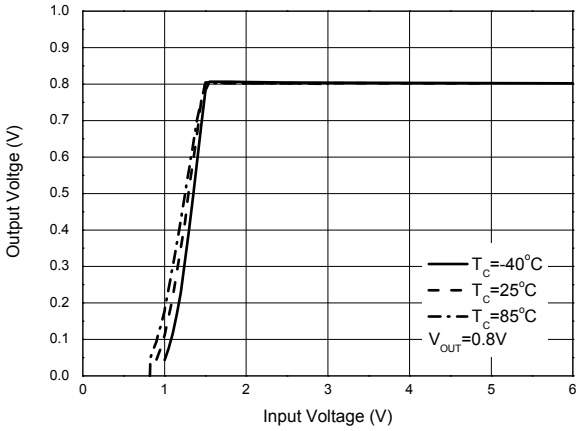


Figure 12. Output Voltage vs. Input Voltage
(I_{OUT}=300mA)

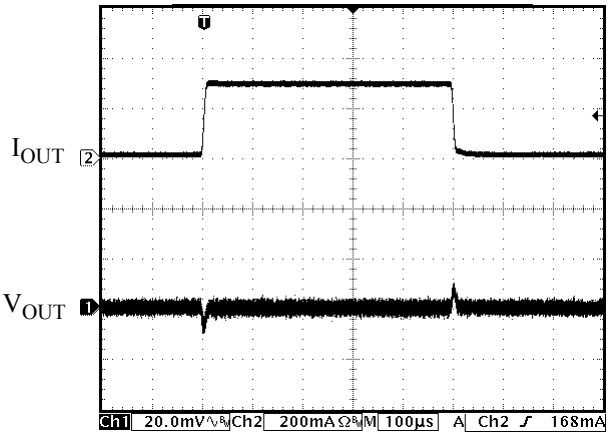


Figure 13. Load Transient
(Conditions: C_{IN}=C_{OUT}=1µF, V_{IN}=2.5V, V_{OUT}=0.8V)

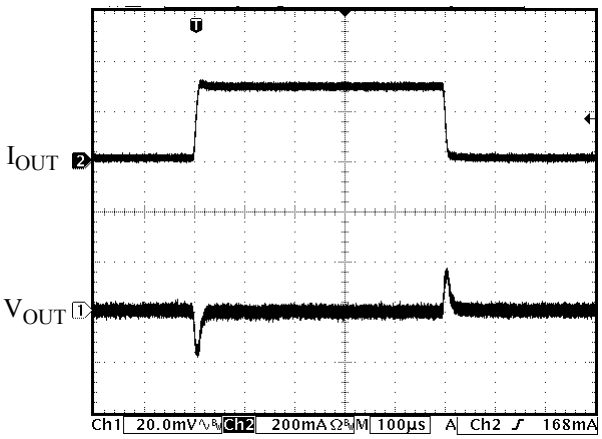


Figure 14. Load Transient
(Conditions: C_{IN}=C_{OUT}=1µF, V_{IN}=4.4V, V_{OUT}=3.3V)

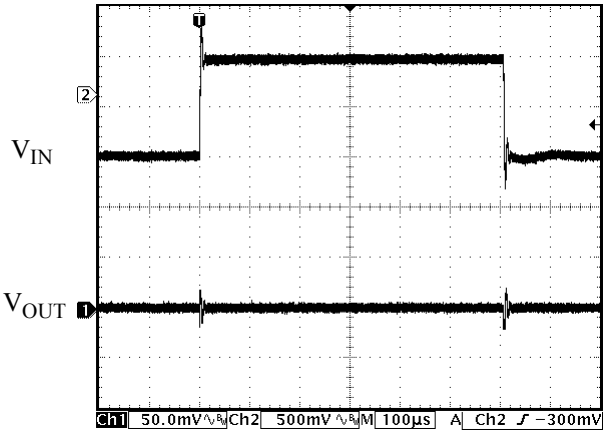


Figure 15. Line Transient
(Conditions: I_{OUT}=30mA, C_{IN}=C_{OUT}=1µF,
V_{IN}=2.5 to 3.5V, V_{OUT}=0.8V)

Typical Performance Characteristics (Continued)

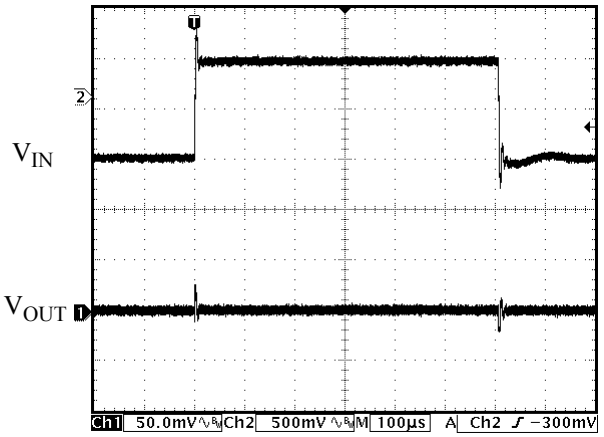


Figure 16. Line Transient

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

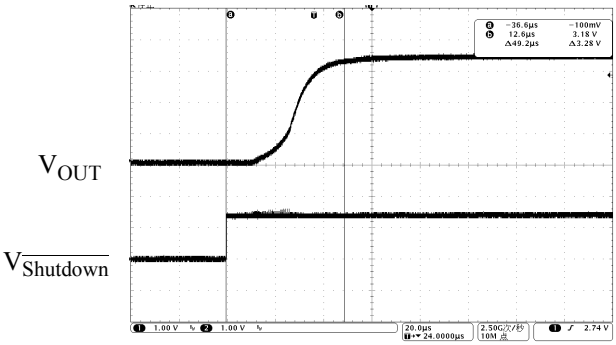


Figure 17. Soft Start Time

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

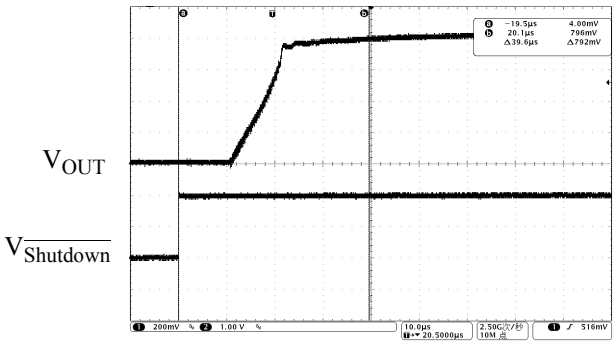


Figure 18. Soft Start Time

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

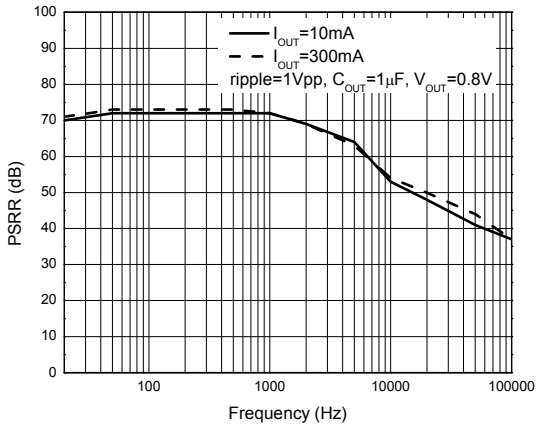


Figure 19. PSRR vs. Frequency

Typical Performance Characteristics (Continued)

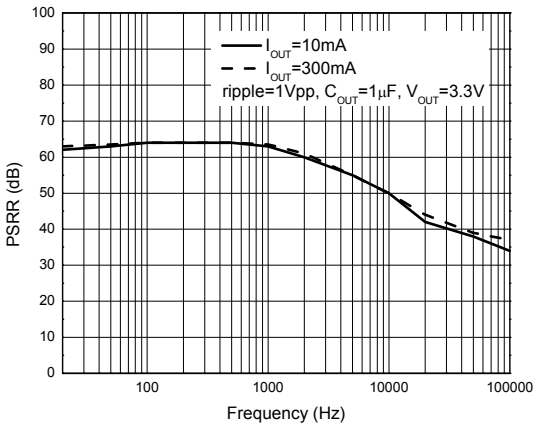


Figure 20. PSRR vs. Frequency

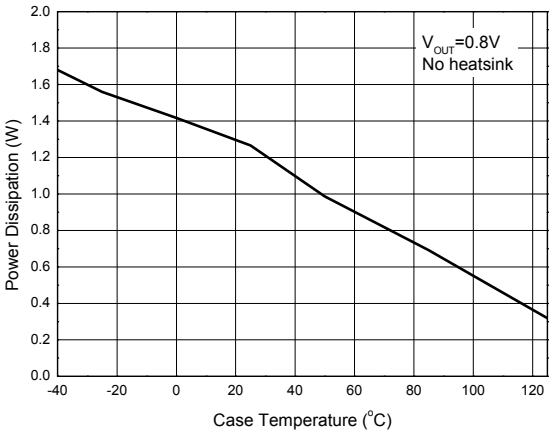
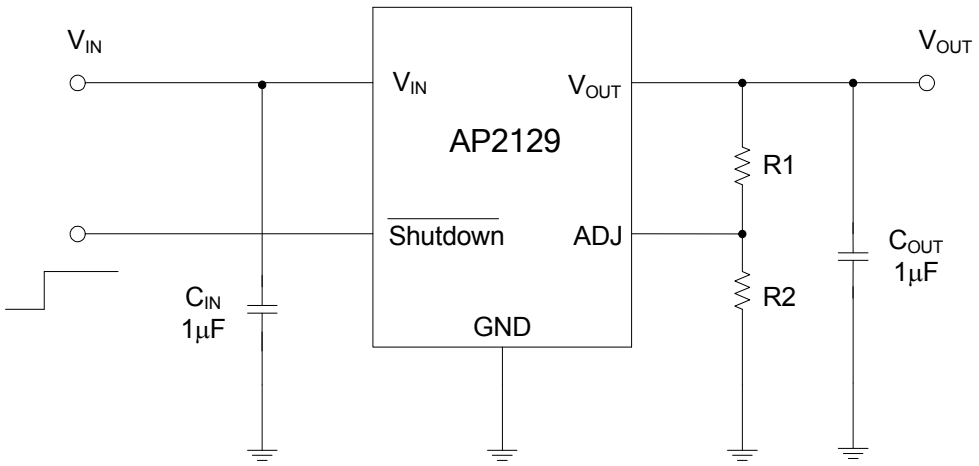
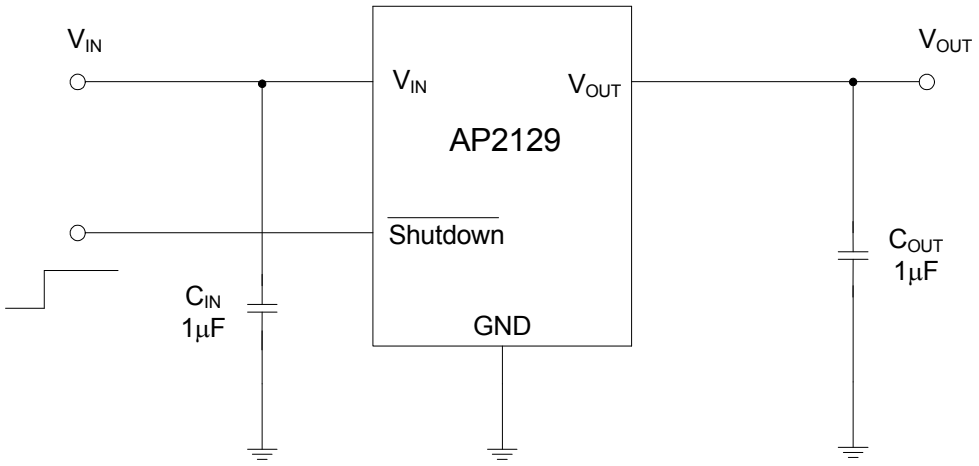


Figure 21. Power Dissipation vs. Case Temperature

Typical Application



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

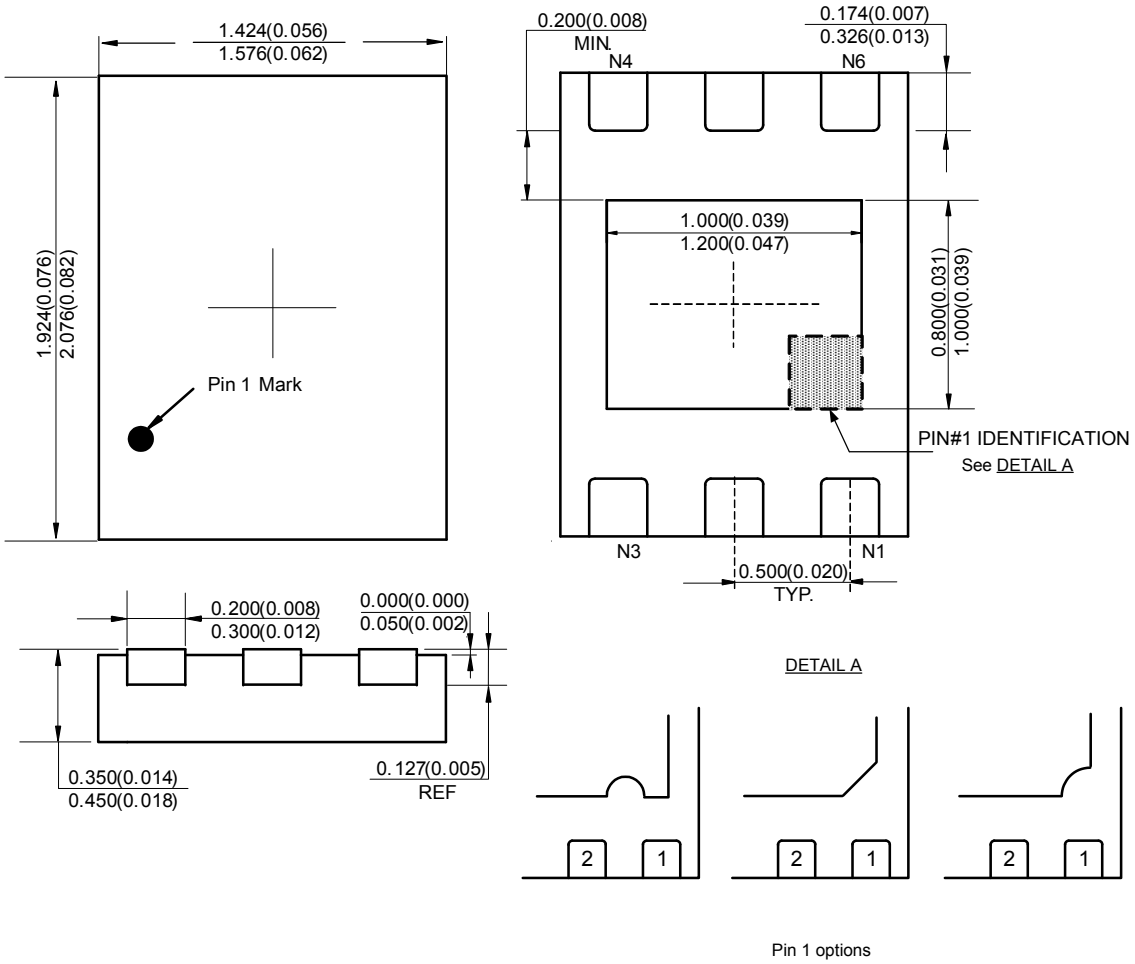


V_{OUT}=1.0V, 1.2V, 1.8V, 2.6V, 2.8V, 3.0V, 3.3V

Figure 22. Typical Application of AP2129

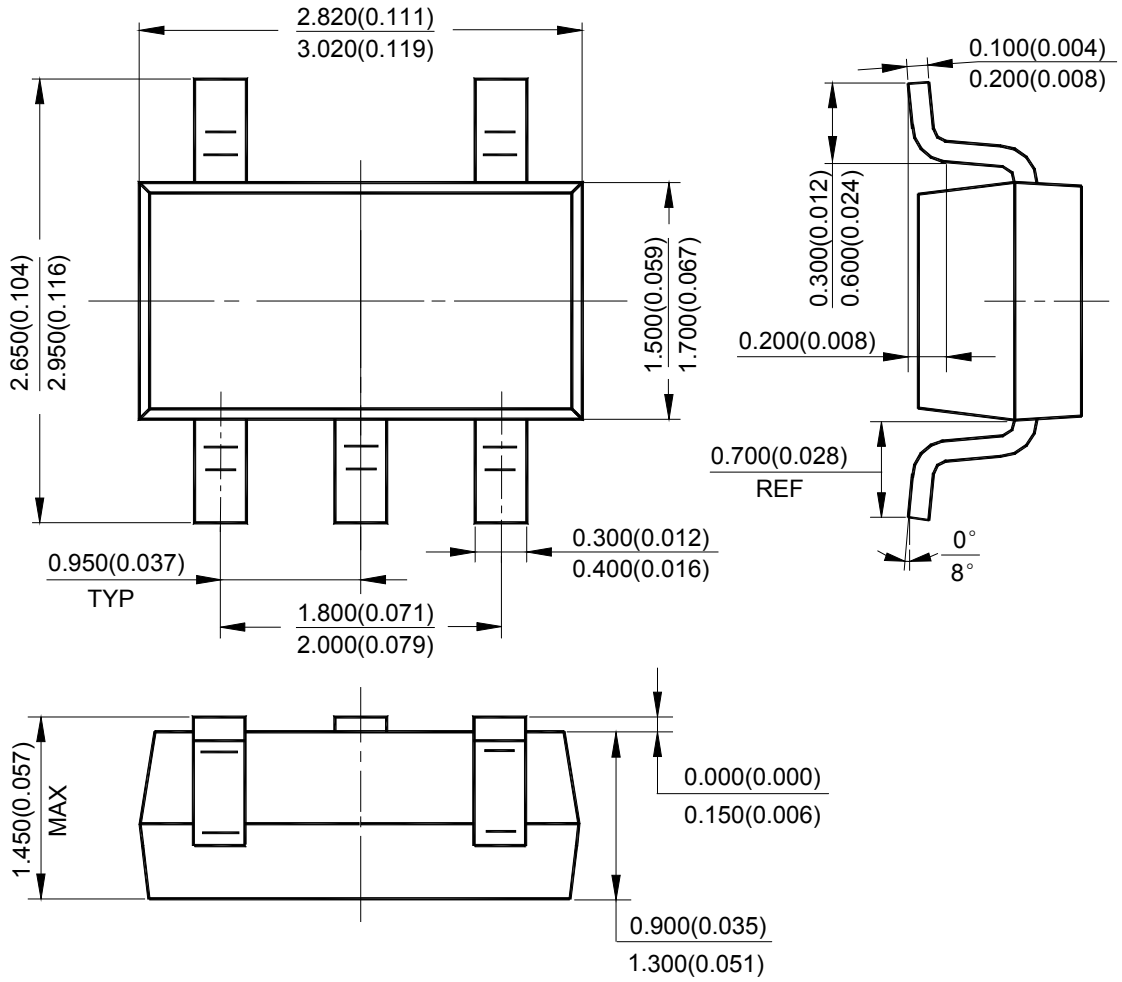
Mechanical Dimensions

DFN-1.5x2-6 **Unit: mm(inch)**



Mechanical Dimensions (Continued)

SOT-23-5 **Unit: mm(inch)**



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