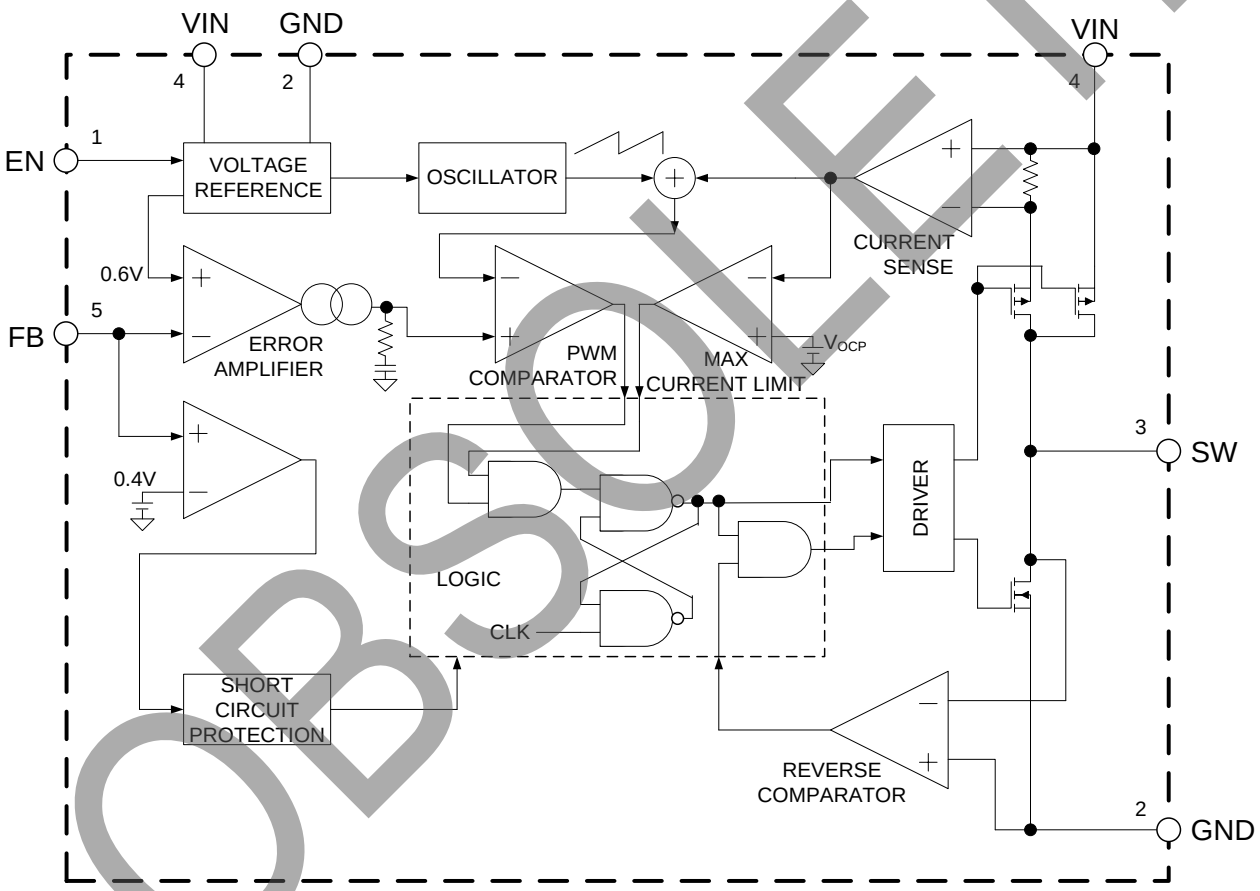
Pin Descriptions

Pin Number	Pin Name	Function
1	EN	Control input pin. Forcing this pin above 1.5V enables the IC. Forcing this pin below 0.4V shuts down the IC. When the IC is in shutdown mode, all functions are disabled to decrease the supply current below 1μA
2	GND	Ground pin
3	SW	Power switch output pin. Inductor connection to drain of the internal PFET and NFET switches
4	VIN	Supply input pin. Bypass to GND with a 4.7μF or greater ceramic capacitor
5	FB	This is the feedback pin of the device. Connect this pin directly to the output if the fixed output voltage version is used. For the adjustable version, an external resistor divider is connected to this pin

Functional Block Diagram



Absolute Maximum Ratings (Note 1)

Symbol	Parameter	Rating	Unit
V_{IN}	Input Voltage	-0.3 to 6.0	V
V_{FB}	Feedback Voltage	-0.3 to V_{IN}+0.3	V
V_{EN}	EN Pin Voltage	-0.3 to V_{IN}+0.3	V
V_{SW}	SW Pin Voltage	-0.3 to V_{IN}+0.3	V
θ_{JA}	Thermal Resistance	265	°C/W
T_J	Operating Junction Temperature	+150	°C
T_{STG}	Storage Temperature	-65 to +150	°C
T_{LEAD}	Lead Temperature (Soldering, 10sec)	+260	°C
–	ESD(Machine Model)	200	V
–	ESD(Human Body Model)	2000	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

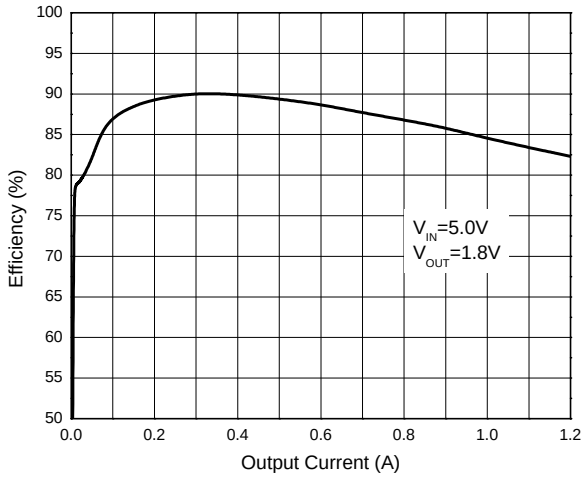
Symbol	Parameter	Min	Max	Unit
V_{IN}	Input Voltage	2.5	5.5	V
T_A	Operating Ambient Temperature	-40	+85	°C

Electrical Characteristics (V_{IN} = 5V, T_A = +25ºC, unless otherwise specified.)

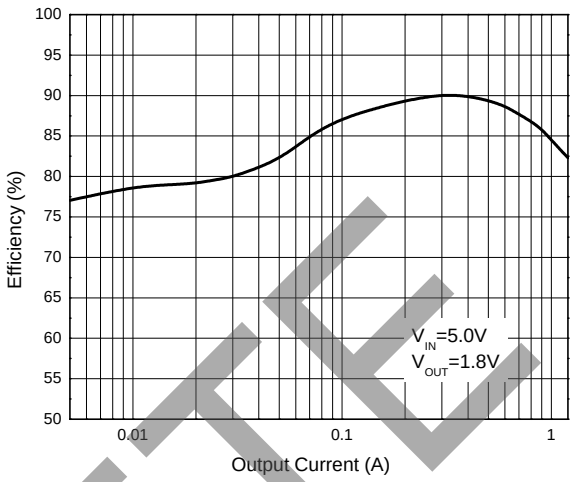
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage	–	2.5	–	5.5	V
I_Q	Quiescent Current	V_{FB} = 0.65V	–	62	100	μA
I_{STBY}	Shutdown Supply Current	V_{EN} = GND	–	0.1	1	μA
V_{REF}	Reference Voltage	–	0.588	0.6	0.612	V
I_{FB_H}	Feedback Bias Current	V_{FB} = 1V	-0.1	–	0.1	μA
I_{FB_L}		V_{FB} = 0V	-0.1	–	0.1	
$R_{DS(ON)\_P}$	PMOSFET R_{ON}	I_{SW} = 200mA	–	0.25	–	Ω
$R_{DS(ON)\_N}$	NMOSFET R_{ON}	I_{SW} = -200mA	–	0.2	–	Ω
I_{LIM}	Switch Current Limit	V_{FB} = 0.55V	1.5	2.0	–	A
V_H	EN Pin Threshold	–	1.5	–	–	V
V_L		–	–	–	0.4	
V_{UVLO}	UVLO Threshold	V_{IN} Rising	–	2.3	–	V
V_{HYS}	UVLO Hysteresis	–	–	0.2	–	
f_{OSC}	Oscillator Frequency	–	1.12	1.40	1.68	MHz
D_{MAX}	Max. Duty Cycle	–	100	–	–	%
D_{MIN}	Min. Duty Cycle	–	–	–	0	
I_{SW_H}	SW Leakage Current	V_{SW} = 0V	–	0.1	–	μA
I_{SW_L}		V_{SW} = 5V	–	0.1	–	
t_{SS}	Soft-start Time	–	–	1	–	ms
T_{OTSD}	Thermal Shutdown	–	–	+160	–	ºC
T_{HYS}	Thermal Shutdown Hysteresis	–	–	+20	–	ºC
V_{IOVP}	Input OVP Threshold	V_{IN} Rising	–	6.3	–	V
V_{IOVP_HYS}	Input OVP Hysteresis	–	–	0.5	–	V

Performance Characteristics

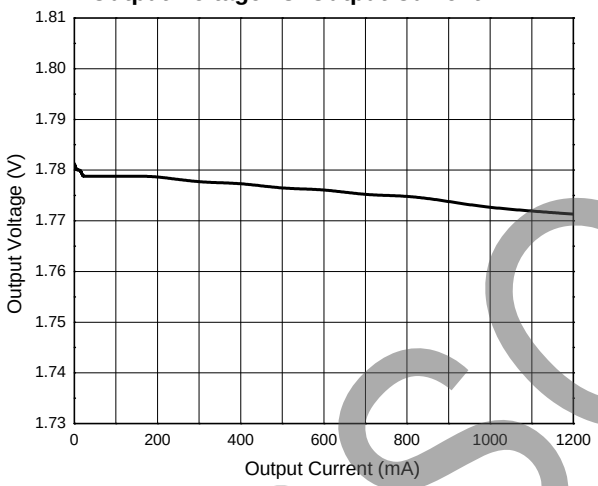
Efficiency vs. Output Current



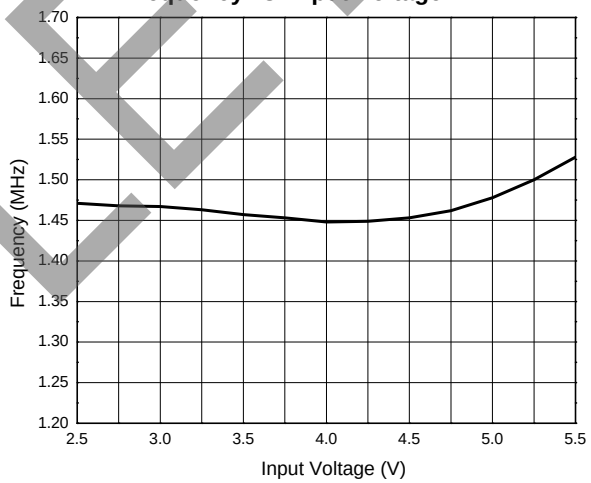
Efficiency vs. Output Current



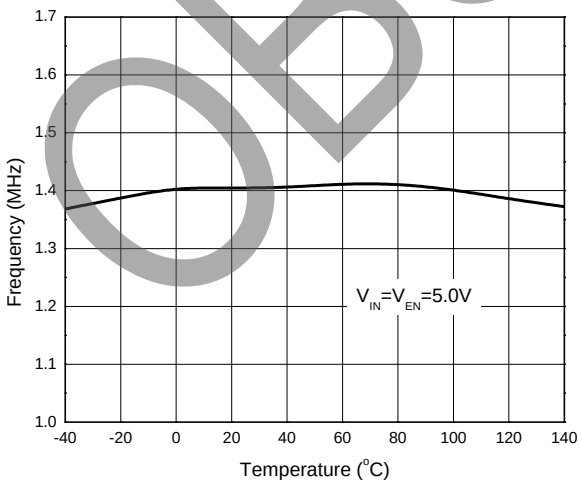
Output Voltage vs. Output Current



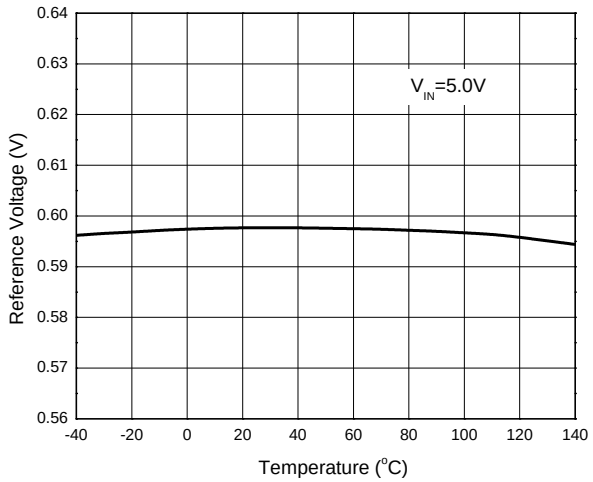
Frequency vs. Input Voltage



Frequency vs. Temperature

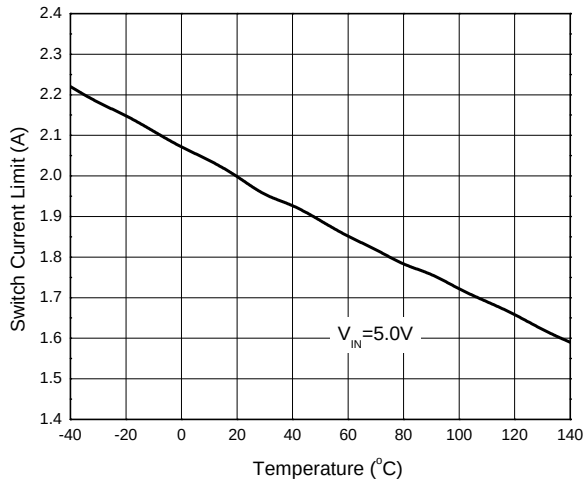


Reference Voltage vs. Temperature

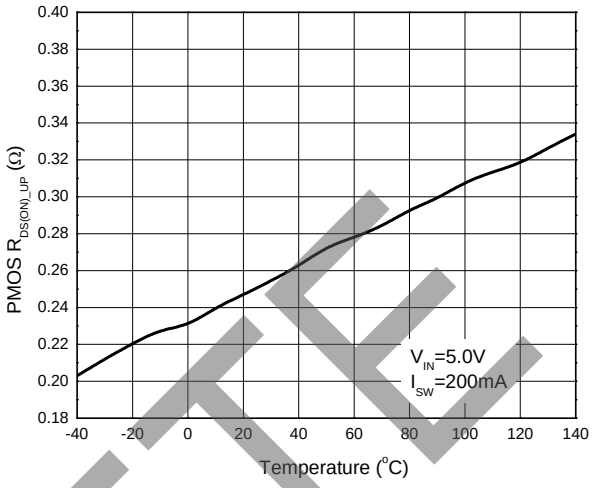


Performance Characteristics (Cont.)

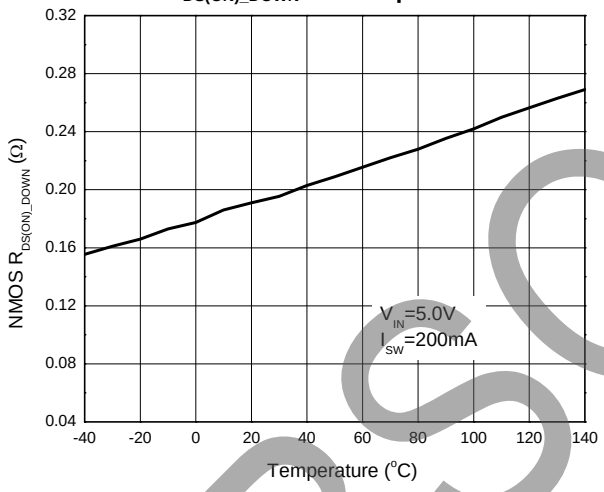
Switch Current Limit vs. Temperature



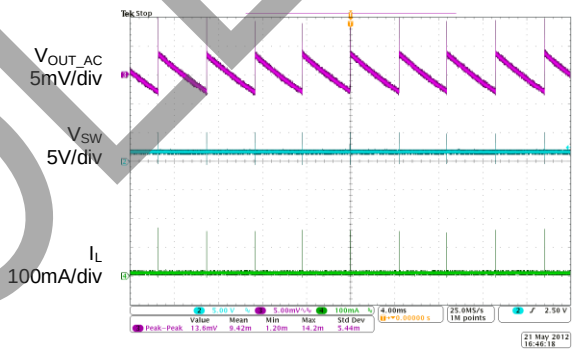
$R_{DS(ON)\_UP}$ vs. Temperature



$R_{DS(ON)\_DOWN}$ vs. Temperature

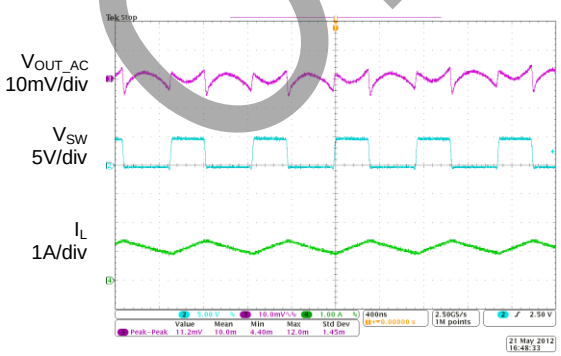


Output Ripple (I_{OUT} = 0A)



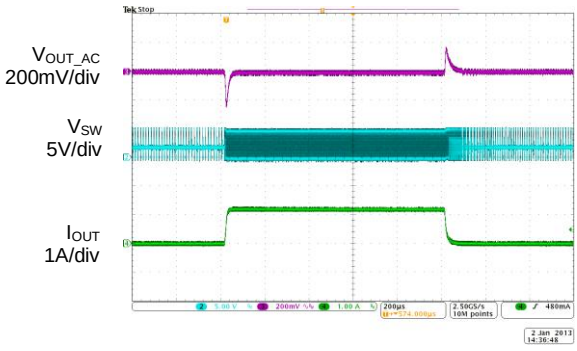
Time 4ms/div

Output Ripple (I_{OUT} = 1.2A)



Time 400ns/div

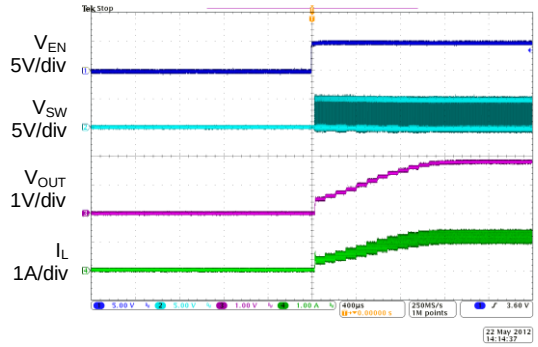
Load Transient (I_{OUT} = 0A to 1.2A)



Time 200µs/div

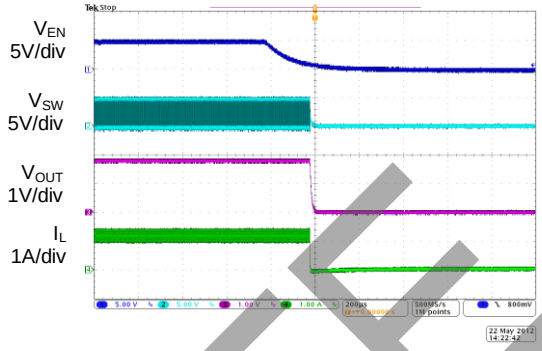
Performance Characteristics (Cont.)

Enable Turn On (I_{OUT} = 1.2A)



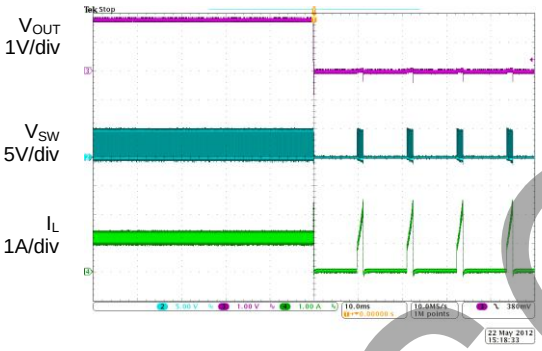
Time 400µs/div

Enable Turn Off (I_{OUT} = 1.2A)



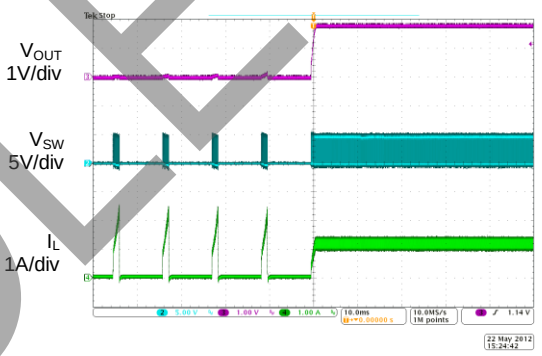
Time 200µs/div

Short Circuit Protection (I_{OUT} = 1.2A)



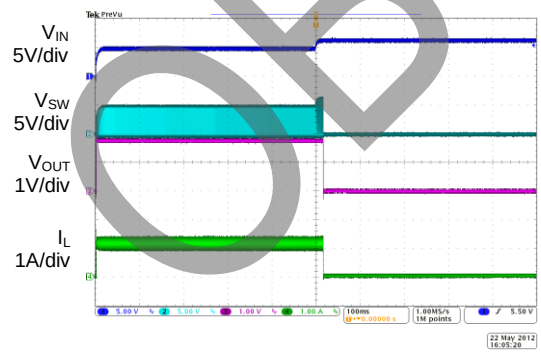
Time 10ms/div

Short Circuit Protection Recovery (I_{OUT} = 1.2A)



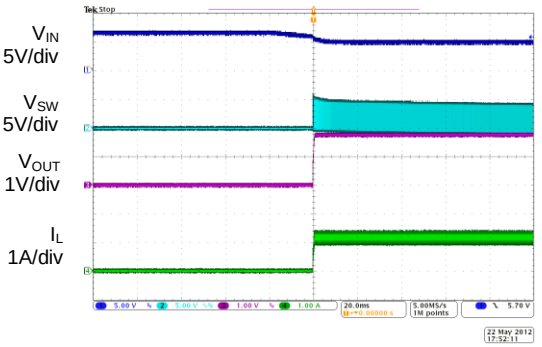
Time 10ms/div

Over Voltage Protection (I_{OUT} = 1.2A)



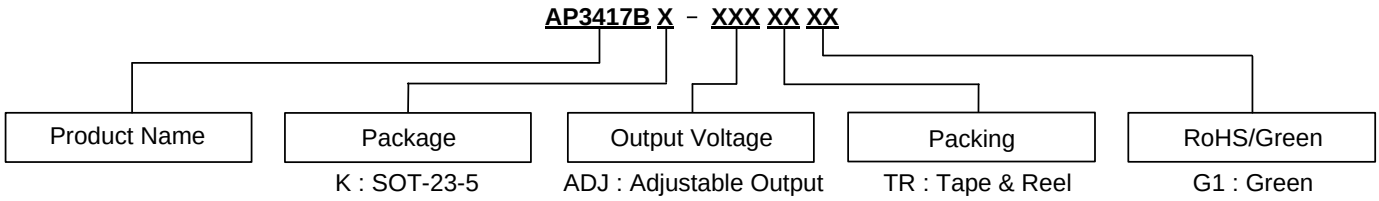
Time 100ms/div

Over Voltage Protection Recovery (I_{OUT} = 1.2A)



Time 20ms/div

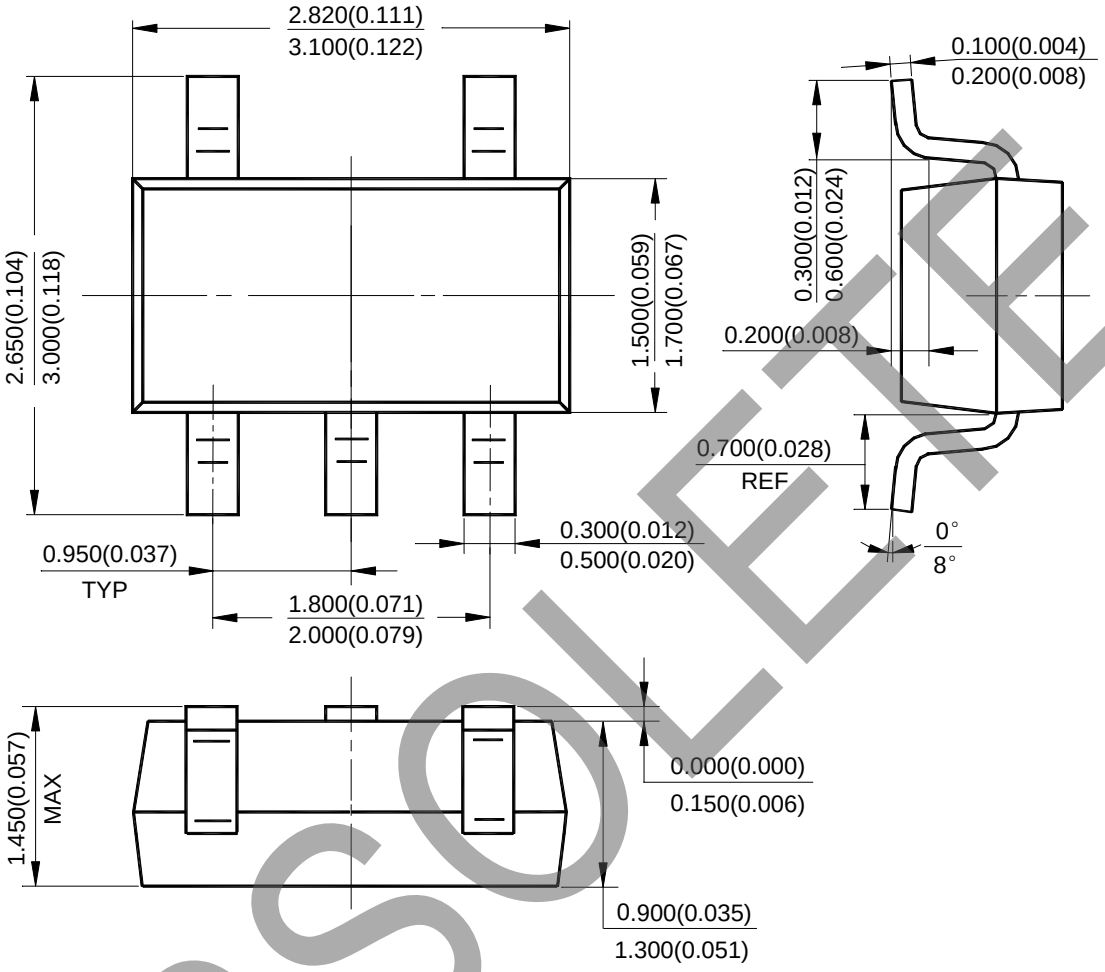
Ordering Information



Package	Temperature Range	Part Number	Marking ID	Packing
SOT-23-5	-40 to +85ºC	AP3417BK-ADJTRG1	G2J	Tape & Reel

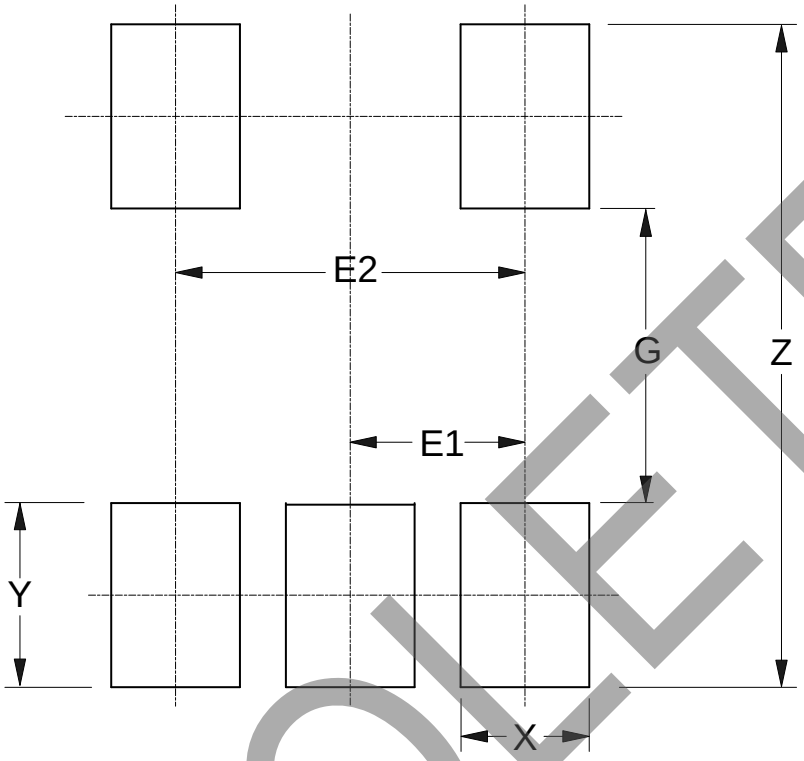
Package Outline Dimensions (All dimensions in mm(inch).)

(1) Package Type: SOT-23-5



Suggested Pad Layout

(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

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