NEW PRODUCT

Functional Block Diagram

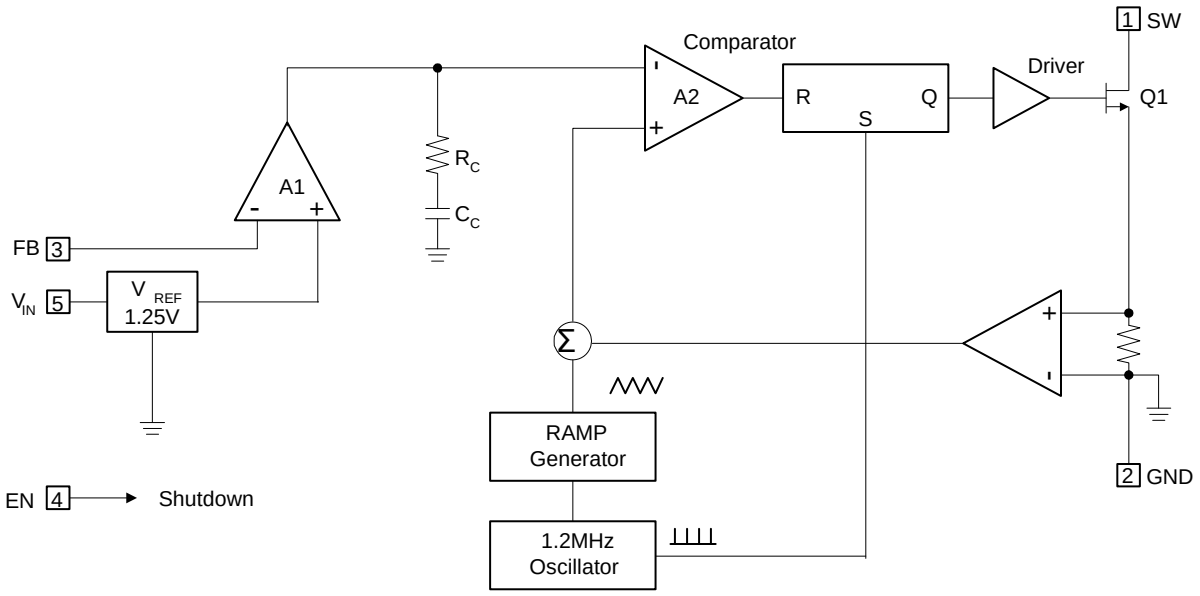


Figure 2. Block Diagram

Pin Descriptions

Name	Description
SW	Switch Pin. Connect inductor/diode here. Minimize trace area at this pin to reduce EMI.
GND	GND pin
FB	Feedback Pin. Reference voltage is 1.25V.
EN	Regulator On/Off Control Input. A high input at EN turns on the converter, and a low input turns it off. When not used, connect EN to the input source for automatic startup. The EN pin cannot be left floating.
V_{IN}	Input Supply Pin. Must be locally decoupled - 4.7µF recommended to reduce input noise.

NEW PRODUCT

Absolute Maximum Ratings (T_A = 25°C)

Symbol	Parameter	Rating	Unit
V_{IN}	VIN Pin Voltage	-0.3~7	V
V_{SW}	SW Voltage	-0.3~32	V
V_{FB}	Feedback Pin Voltage	-0.3~7	V
EN	EN	-0.3~7	V
$T_{J(MAX)}$	Maximum Junction Temperature	150	°C
T_{LEAD}	Lead Temperature	300	°C
T_{ST}	Storage Temperature Range	-65 to +150	°C

Caution: The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any condition.

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{IN}	Input Voltage	2.7	5.5	V
T_J	Operating Junction Temperature	-40	125	°C
T_A	Operating Ambient Temperature	-40	85	°C

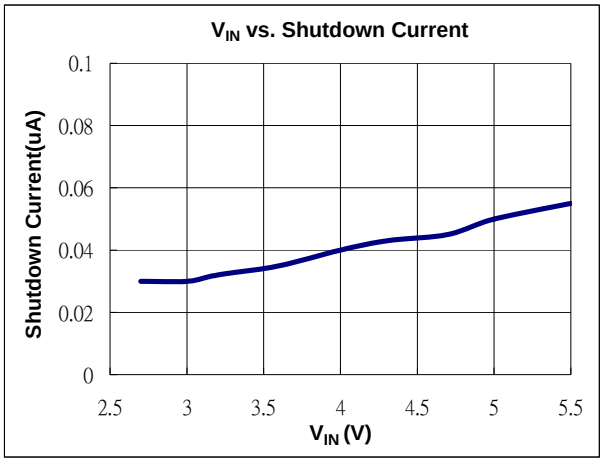
Electrical Characteristics (V_{IN} = 3.6V, T_A = 25°C, unless otherwise specified)

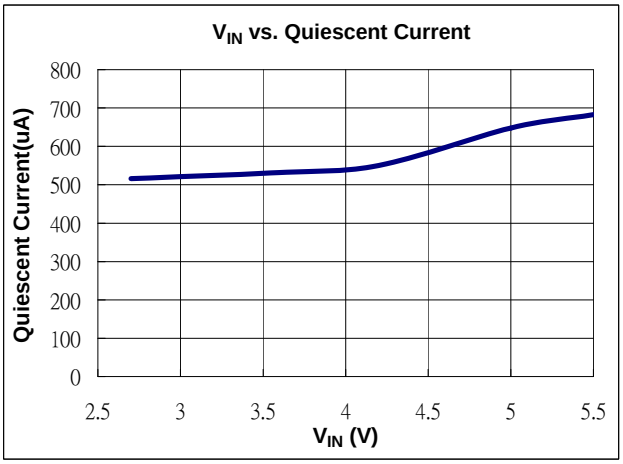
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
System Supply Input						
V_{IN}	Operating Input Voltage		2.7	-	5.5	V
UVLO	Under Voltage Lockout		-	2.2	2.4	V
	Under Voltage Lockout Hysteretic		-	85	-	mV
I_Q	Quiescent Current	FB=1.3V, No Switching	-	500	-	μA
I_{SD}	Shutdown Current	V_{EN} < 0.4V	-	0.1	1	μA
Oscillator						
F_{OSC}	Operation Frequency		1	1.2	1.4	MHz
Dmax	Maximum Duty Cycle		86	90	-	%
Reference Voltage						
V_{FB}	Feedback Voltage		1.225	1.25	1.275	V
I_{FB}	FB Pin Bias Current		10	45	100	nA
MOSFET						
$R_{DS(on)}$	On Resistance of MOSFET		-	0.95	1.2	Ω
I_{OCP}	Switching Current Limit	Normal Operation	-	750	-	mA
Control and Protection						
EN	Voltage High	ON	1.5	-	-	V
EN	Voltage Low	OFF	-	-	0.4	V
I_{EN}	EN Pin Pull Low Current		-	4	6	μA
θ_{JA}	Thermal Resistance Junction-to-Ambient	SOT25 (Note 2)		162		°C/W
θ_{JC}	Thermal Resistance Junction-to-Case	SOT25 (Note 2)		36		°C/W

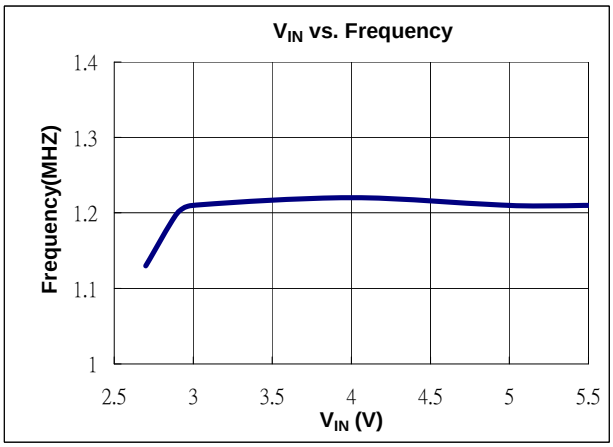
Notes: 2. Test condition for SOT25: Device mounted on FR-4 substrate, single-layer PC board, 2oz copper, with minimum recommended pad layout

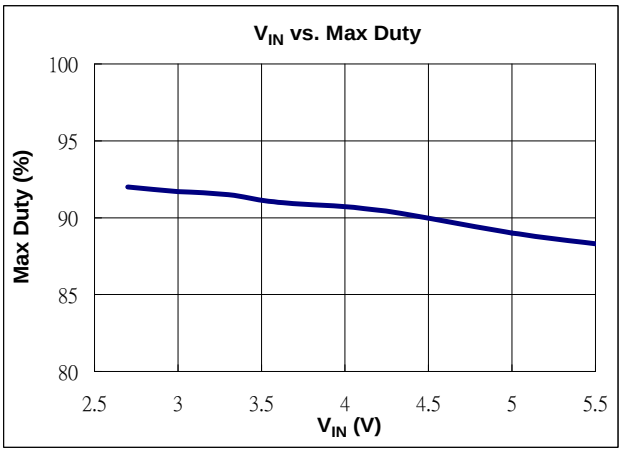
NEW PRODUCT

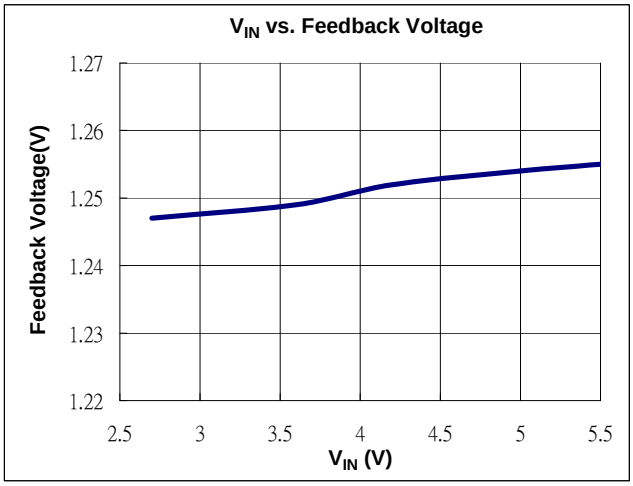
Typical Performance Characteristics (V_{IN} 3.3V; V_{OUT} = 15V I_{OUT} = 20mA)

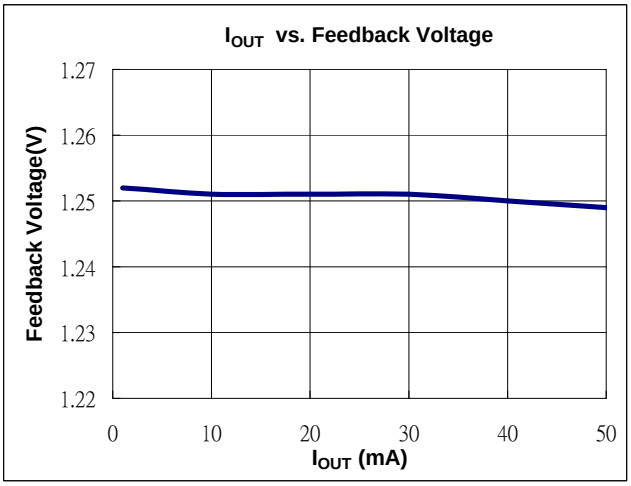






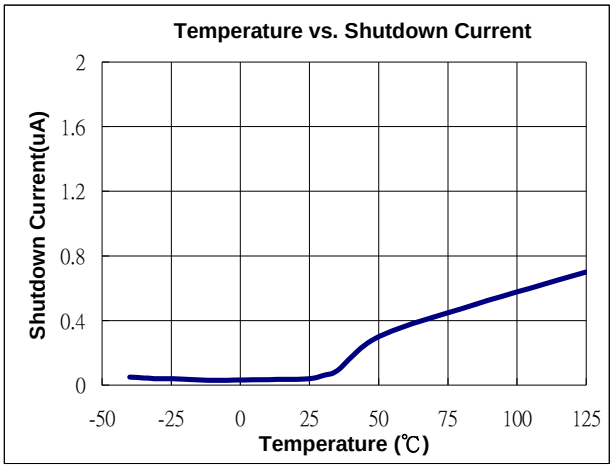


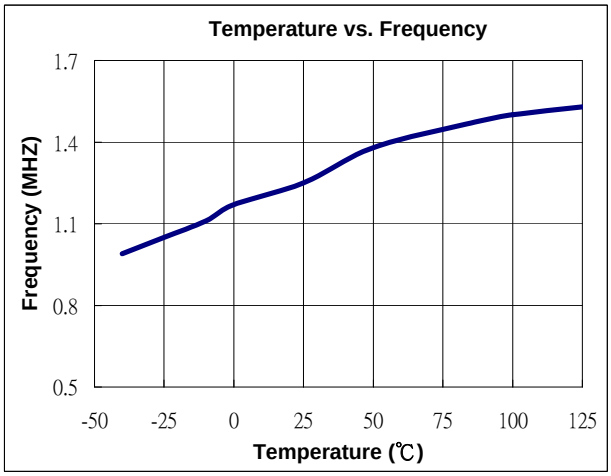


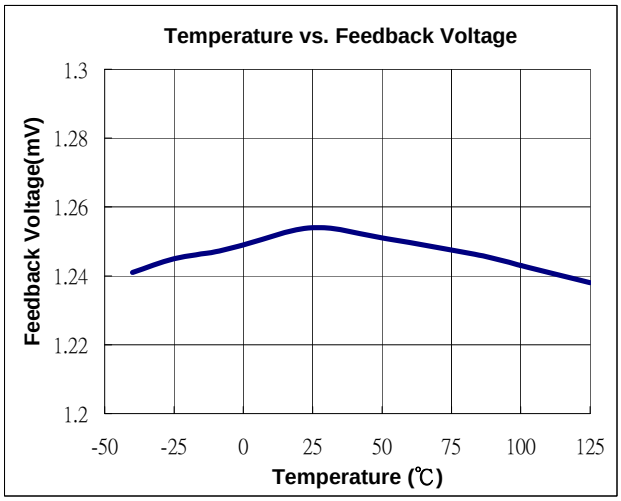


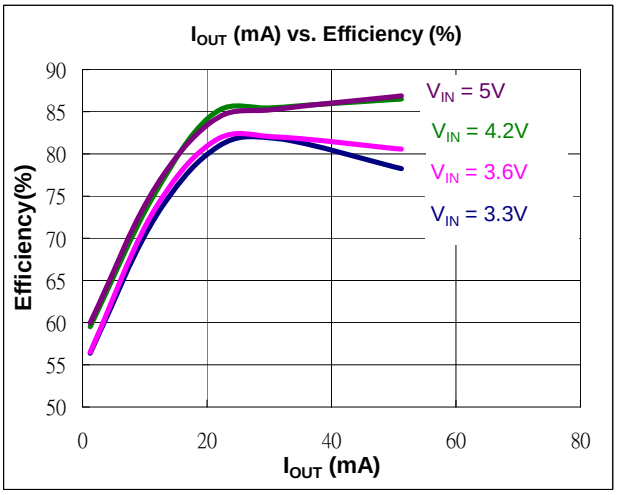
NEW PRODUCT

Typical Performance Characteristics (V_{IN} 3.3V; V_{OUT} = 15V I_{OUT} = 20mA)





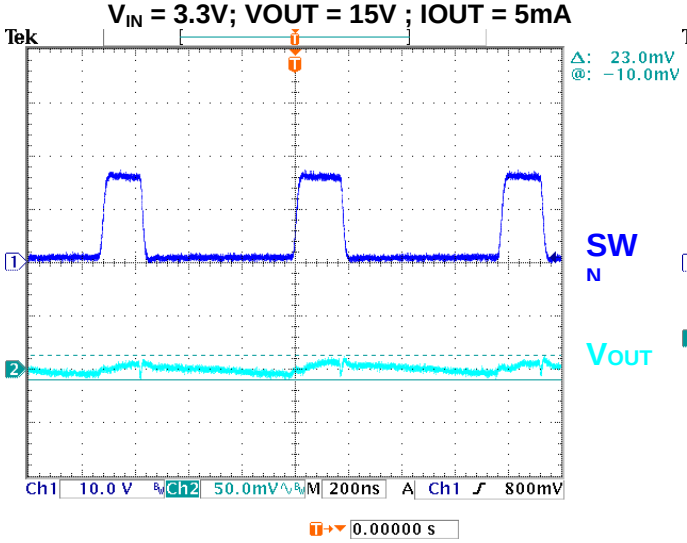




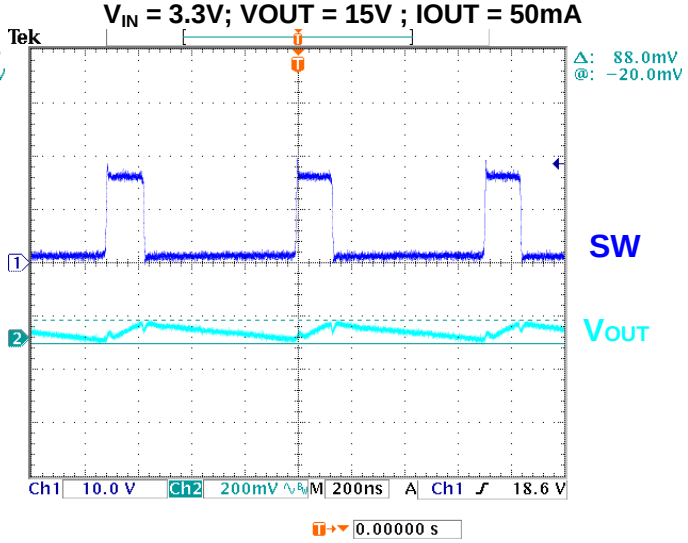
NEW PRODUCT

Typical Performance Characteristics (Continued)

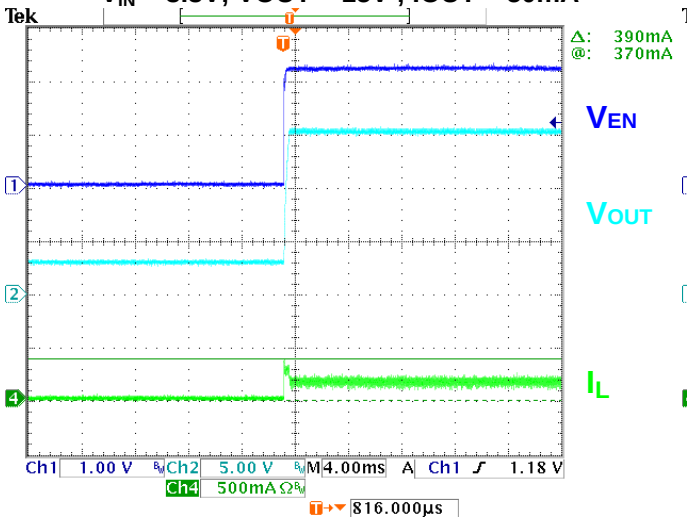
V_{OUT} Ripple
V_{IN} = 3.3V; VOUT = 15V ; IOUT = 5mA



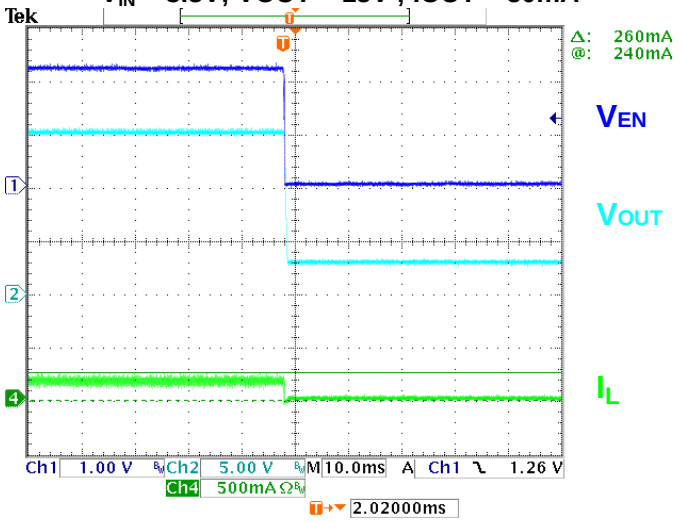
V_{OUT} Ripple
V_{IN} = 3.3V; VOUT = 15V ; IOUT = 50mA



POWER ON
V_{IN} = 3.3V; VOUT = 15V ; IOUT = 50mA



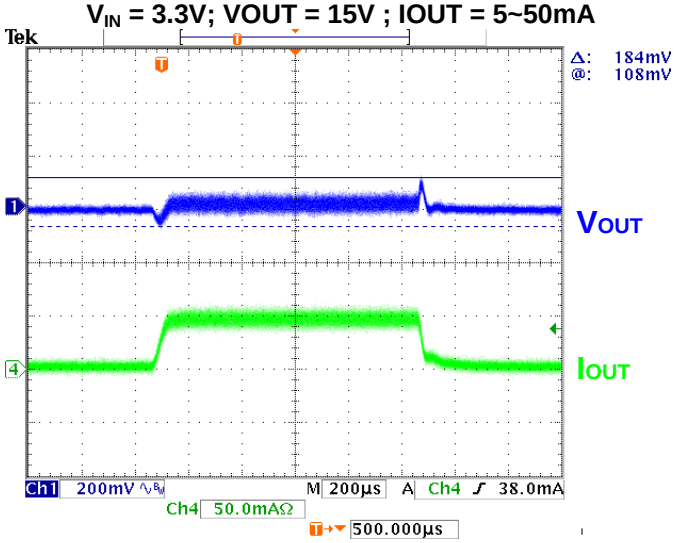
POWER OFF
V_{IN} = 3.3V; VOUT = 15V ; IOUT = 50mA



NEW PRODUCT

Typical Performance Characteristics (Continued)

Load Transient Response
V_{IN} = 3.3V; VOUT = 15V ; IOUT = 5~50mA



Application Information

Inductor Selection

A 10µH~22µH inductor is recommended for most AP5727 applications. Although small size and high efficiency are major concerns, the inductor should have low core loss at 1.2MHz and low DCR.

Capacitor Selection

Ceramic capacitors, due to their small size, are ideal for AP5727 applications. X5R and X7R types are recommended because they retain their capacitance over wider voltage and temperature ranges than other types such as X5R and X7R. A 4.7µF input capacitor and a 10µF output capacitor are sufficient for most AP5727 applications.

Diode Selection

Schottky diodes, with their low forward voltage drop and fast reverse recovery, are the ideal choices for AP5727 applications. The forward voltage drop of a Schottky diode represents the conduction loss in the diode, while the diode capacitance (C_T) represents the switching loss. For diode selection, both forward voltage drop and diode capacitance need to be considered. Schottky diodes with higher current ratings usually have lower forward voltage drop and larger diode capacitance, which can cause significant switching loss at the 1.2MHz switching frequency of the AP5727.

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Application Circuit

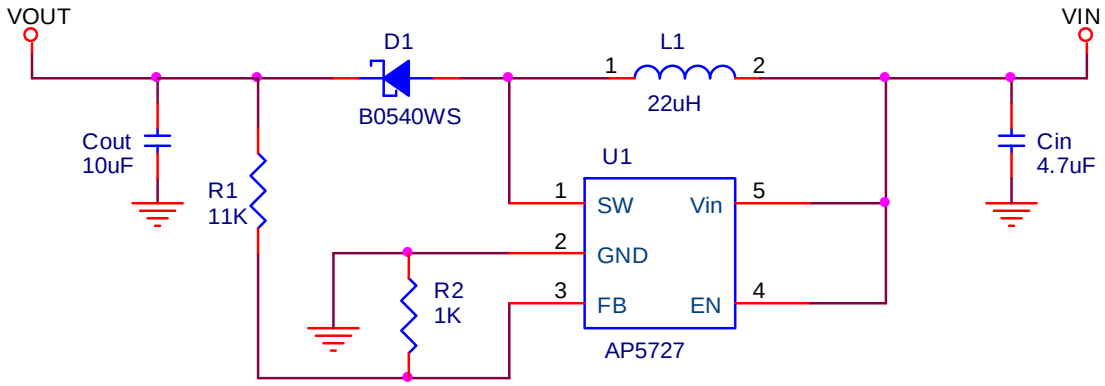


Table 1. Suggested Inductors

Vendor	Inductors (uH)	Current Rating (A)	Type	Dimensions (mm)	Series
Wurth Electronics	22	0.51A	SMD	3.8X 3.8 X 1.6	744031220
GOTREND	22	0.56A	SMD	3.8 X 3.8 X 1.05	GLP3810PH220N
TAIYO YUDEN	22	0.51A	SMD	4.0 X 4.0 X 1.25	NR4012

Table 2. Suggested Capacitors for C_{IN} and C_{OUT}

Vendor	Capacitance	Type	Series
TAIYO YUDEN	4.7uF	SMD	LMK316 B7 475KL-T
TAIYO YUDEN	10uF	SMD	LMK316 F 106ZL-T

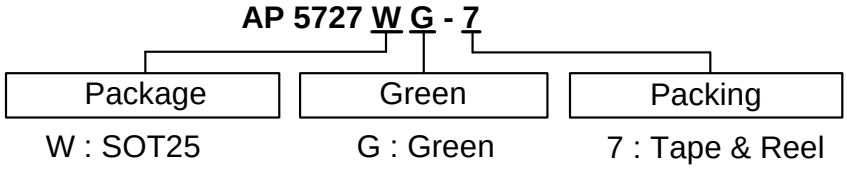
Table 3. Suggested Diodes

Vendor	Rating	Type	Series
ZETEX	40V/0.5A	SOD323	ZLLS400
DIODES	40V/0.5A	SOD323	B0540WS
DIODES	40V/0.25A	SOD523	SDM20U40

Table 4. Suggested Resistor

Vendor	Type	Series
YAGEO	SMD	FR-SK

Ordering Information



Device	Package Code	Packaging (Note 3)	7" Tape and Reel	
			Quantity	Part Number Suffix
AP5727WG-7	W	SOT25	3000/Tape & Reel	-7

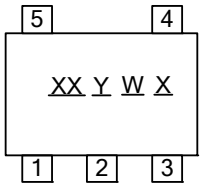
Note: 3. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.

NEW PRODUCT

Marking Information

(1) SOT25

(Top View)

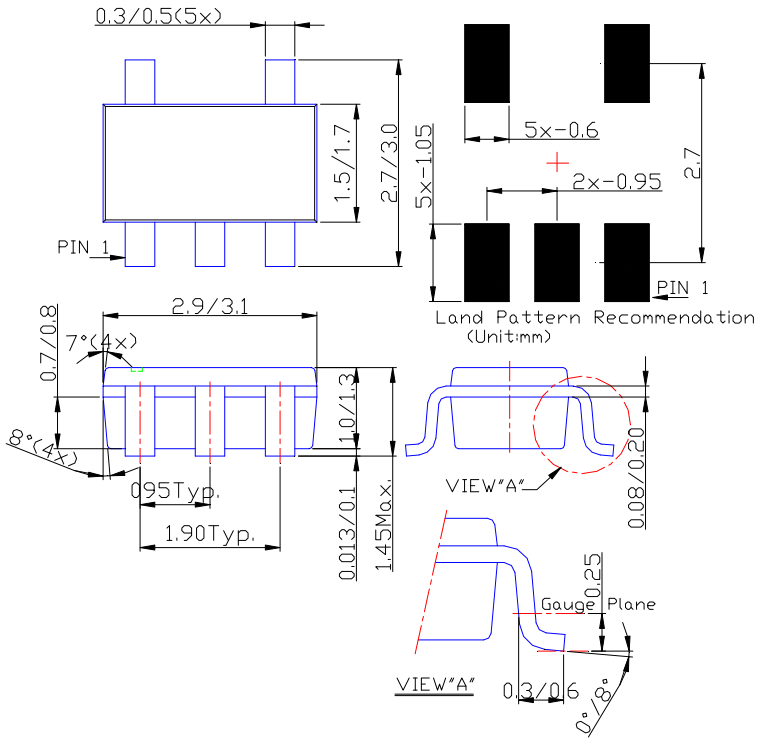


XX : Identification Code
Y : Year 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week; z represents
52 and 53 week
X : A~Z : Green

Part Number	Package	Identification Code
AP5727	SOT25	H8

Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SOT25



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