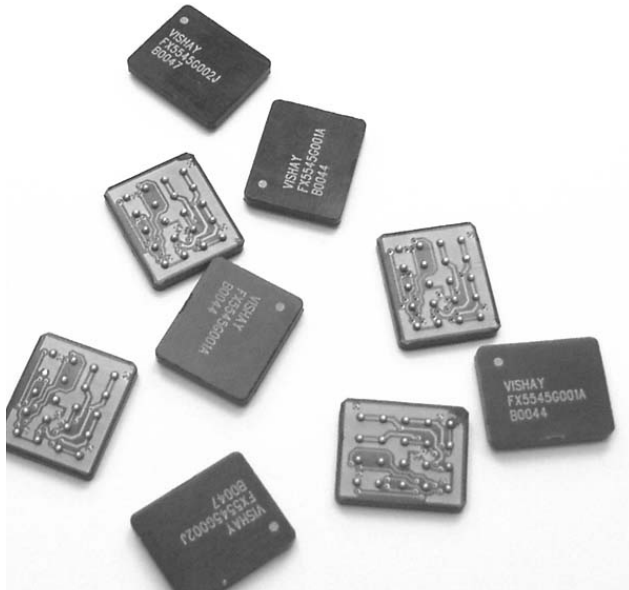# Industry Smallest and Lowest Profile
Synchronous 1.5W 0.6A DC/DC
Buck Converter with High Output Power Density

FEATURES

- Fully integrated DC/DC converter
- High efficiency over large load range
- 2MHz switching frequency
- 100% duty cycle
- Power density - more than 80W/inch^3
- 1µA shutdown current
- 2.7V to 6V input range (1Li+ and 3-cell NiCd or NiMH cells)
- 1.35V to 4.5V** output voltage with max output current of 600mA
- Programmable PWM/$\overline{\text{PSM}}$ controls
- Low output ripple
- BGA/LGA construction
- Temperature range: - 40°C to + 85°C
- No external components needed
- Low profile
- UL recognized component E250930

Note: For higher output voltage please consult factory at FunctionPAK@Vishay.com

RoHS*
COMPLIANT

The DC/DC converter provides fully integrated synchronous buck converter solution for the latest one-cell lithium ion cellular phones. Its input voltage is between 2.7V to 6V, capable of delivering 600mA of output current at 1.5V to 3.6V.

The DC/DC converter combines the 2MHz-switching controller with fully integrated passive components needed to deliver the smallest and most efficient converter available today. The high switching frequency minimizes the output capacitance with peak to peak output ripple as low as 20mV. The DC/DC converter delivers efficiency up to 95%. The programmable pulse-skipping mode ($\overline{\text{PSM}}$) maintains this high efficiency even during the standby and idle modes to increase overall battery life and talktime. In order to extract the last ounce of power from the battery, the DC/DC converter is designed with 100% duty cycle control for this mode. This function enables the DC/DC converter to operate like a saturated linear regulator delivering the highest potential output voltage for longer talk time.

The DC/DC converter is available in 20-ports BGA/LGA package. In order to satisfy the stringent ambient temperature requirements, the DC/DC converter is designed to handle the industrial temperature range of - 40°C to + 85°C.
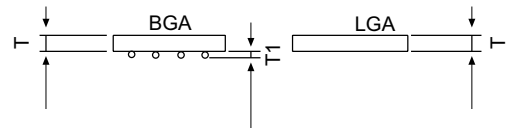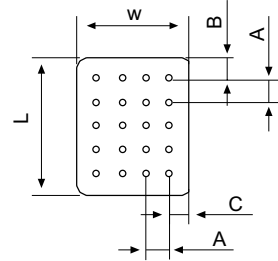
APPLICATION

- Point of Load (POL) applications such as drivers for FPGA's, microprocessors, DSP's amplifiers, etc.
- Cellular and cordless phones, PDAs and others
- Supply voltage source for low voltage chip sets
- Portable computers
- Battery back-up supplies
- Digital cameras
- Routers
- Fiber optics
- LANS
- Image processing

ORDERING INFORMATION

FX	5545	G001	□ □ □	□ □

FUNCTIONPAK

SIZE

CIRCUIT IDENTIFIER

OUTPUT VOLTAGE - Example: 2.7V should be written as 2V7 as the V indicates the decimal point, or ADJ for adjustable version - self selectable output voltage.

PACKAGING - B1 = 10pcs in bulk; B5 = 50pcs in bulk; T1 = 13" reel; T2 = 7" reel.

For lead (Pb)-free solder please add E2 suffix.

* Pb containing terminations are not RoHS compliant, exemptions may apply

Document Number: 10101
Revision: 04-Sep-06

For technical questions, contact FunctionPAK@vishay.com
For marketing questions, contact FunctionPAK.marketing@vishay.com

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DIMENSIONS in inches [millimeters]	
L	0.58 ± 0.01 [14.7 ± 0.25]
W	0.48 ± 0.01 [12.2 ± 0.25]
A	0.1 ± 0.01 [2.54 ± 0.25]
B	0.09 ± 0.01 [2.29 ± 0.25]
C	0.09 ± 0.01 [2.29 ± 0.25]
T	0.071 ± 0.04 [1.8 ± 0.1]
T1	0.022 [0.55]
Ball Diameter	0.03 ± 0.001 [0.762 ± 0.025]

BOTTOM SIDE

Marked on Upper Side
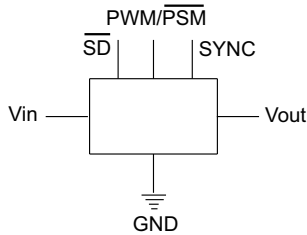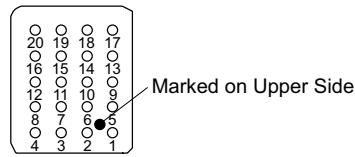
PIN CONFIGURATION*

PIN	CONNECTION
1, 2	$\overline{SD}$
3, 7	SYNC
4, 8	N/C
5, 9	Vin
6, 10	PWM/$\overline{PSM}$
11, 12	N/C
13, 17	GND
14, 18	Vout
15, 19	N/C
16, 20	GND

*Note: Pin Description application note is available at
www.vishay.com/doc?10119

| RECOMMENDED PAD PATTERN in inches [millimeters]		
A	D	F
0.1 ± 0.01 [2.54 ± 0.25]	0.03 ± 0.002 [0.8 ± 0.05]	0.02 ± 0.002 [0.5 ± 0.05]
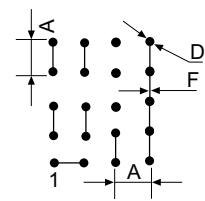
TAPE AND REEL

See Tape and Reel Information - Type A

STANDARD ELECTRICAL SPECIFICATIONS

| PARAMETER	UNIT	CONDITION	MIN	TYP	MAX
Input Voltage Range	V_{DC}		2.7		6
Insulation Test Voltage Resistance Leakage Current	V_{AC} Ω nA	60 Hz 60 sec $V_{ISO} = 500V_{DC}$ $V_{ISO} = 500V_{DC}$	750 1×10^{11}		5
Output Power Voltage Voltage Tolerance Temp. Coefficient Ripple and Noise	W V_{DC} % %/°C mVpp	at 25°C Ambient Temperature DC to 20MHz	- 3	1.5 1.35 to 4.5 15	3 0.03 30
General Switching Frequency Package Weight	MHz gr.			2	0.9
Temperature Operation Storage	°C °C		- 40 - 55		+ 85 + 125

Vout Vs. Iout (Typ)*
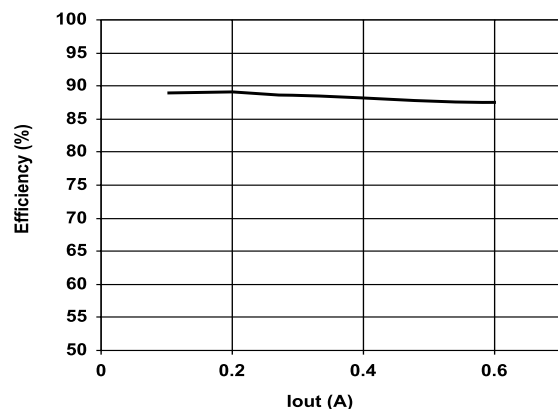**Vin = 3.6V; Vout = 2.7V**
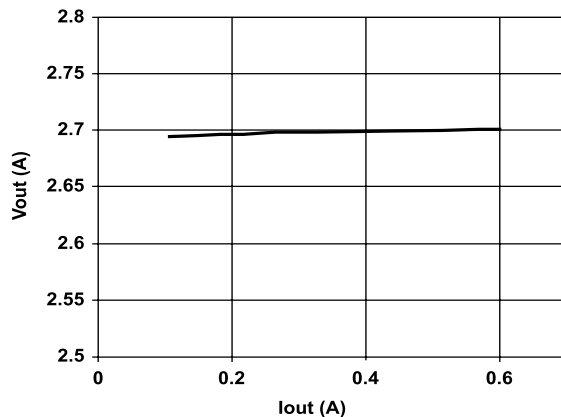
Vout Vs. Vin (Typ)*
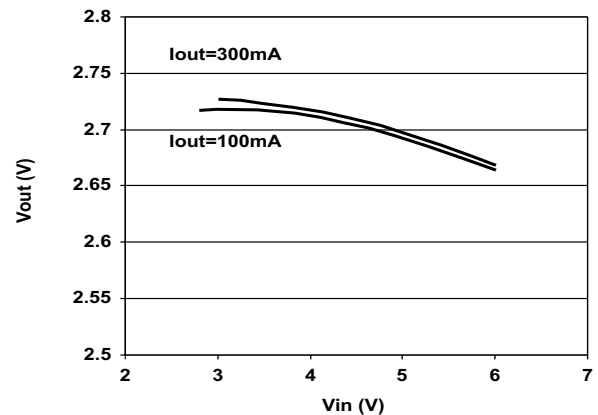
Δ Temp Vs. Iout*
Above 25 °C Ambient Temperature
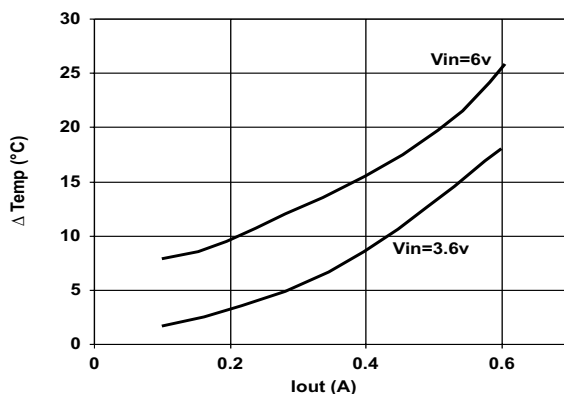
Efficiency Vs. Iout (Typ)*
Vin = 3.6V; Vout = 2.7V

*Note: Measurements were taken with Power supply: ZUP 20-40 from Nemic Lambda; Electronic load: 6063B from Agilent; Multimeter: Fluke 45 from Fluke and 34401 digital multimeter from Agilent; Scope: Infiniium 54815A from Agilent.

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