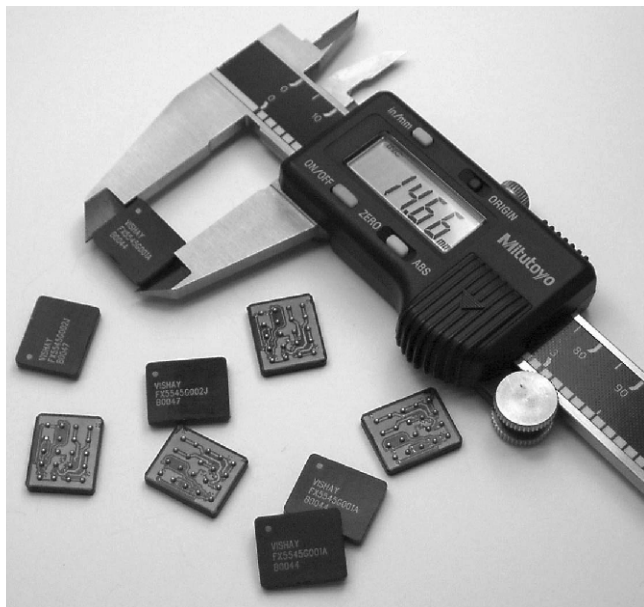


The Smallest and Low Profile 0.9V to 4.5V**, 4A with 570W/in³ Power Density Efficiency up to 95% DC/DC Buck Converter



FEATURES

- Fully integrated DC/DC converter
- High efficiency over large load range
- 100% duty cycle
- Power density - more than 570W/inch³
- 1μA shutdown current
- 2.5V to 6V input range (1Li+ and 3-cell NiCd or NiMH cells)
- 0.9V to 4.5V output voltage
- Programmable PWM/PSM controls
- Low output ripple
- BGA construction
- Temperature range: - 40°C to + 85°C
- No external components needed
- Output power 15W
- Maximum current 4A
- Low profile
- UL recognized component E250930

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



The DC/DC converter is a programmable topology synchronized Buck converter for today's continuous changing portable electronic market. The DC/DC converter provides flexibility of utilizing various battery configurations and chemistries such as NiCd, NiMH, or Li+ with an input voltage range of 2.5V to 6V. An additional flexibility is provided with topology programmability to power multiple loads such as power amplifiers, microcontrollers, or baseband logic IC's. For ultra-high efficiency, converters are designed to operate in synchronous rectified PWM mode under full load while transforming into externally controlled pulse-skipping mode (PSM) under light load.

The DC/DC converter is available in 20-ports BGA 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

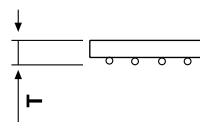
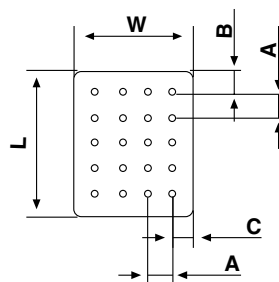
- Cordless phones, PDA's and others
- Supply voltage source for low-voltage chip sets
- Point of Load (POL) applications such as drivers for FPGA's, microprocessors, DSP's amplifiers, etc.
- Portable computers
- Battery back-up supplies
- Cameras

ORDERING INFORMATION

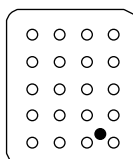
FUNCTION	FX	5545	G108	☐	☐	☐	☐	☐	☐
SIZE									
CIRCUIT IDENTIFIER									
OUTPUT VOLTAGE - Output Voltage-Example: 2.7V should be written as 2V7 as the V indicates the decimal point, or ADJ for adjustable version - self selectable output voltage.									
PACKAGING - B1 = 10pcs in bulk; B5 = 50pcs in bulk; T1 = 13" reel; T2 = 7" reel.									
For lead (Pb)-free solder please add E2 suffix. Leave blank for regular SnPb.									

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

DIMENSIONS in inches [millimeters]	
L	0.58 ± 0.01 [14.7 $\pm$ 0.25]
W	0.48 ± 0.01 [12.2 $\pm$ 0.25]
A	0.1 ± 0.01 [2.54 $\pm$ 0.25]
B	0.09 ± 0.01 [2.29 $\pm$ 0.25]
C	0.09 ± 0.01 [2.27 $\pm$ 0.25]
T	0.126 max [3.2 max]
Ball Diameter	0.03 ± 0.001 [0.762 $\pm$ 0.025]



BOTTOM SIDE



Note:

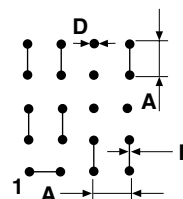
* Pin Description application note is available at
www.vishay.com/doc?10116

** If not used must be connected to Vin.

PIN CONFIGURATION*

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

RECOMMENDED PAD PATTERN in inches [millimeters]		
A	D	F
0.1 ± 0.01 [2.54 $\pm$ 0.25]	0.03 ± 0.001 [0.8 $\pm$ 0.02]	0.02 ± 0.001 [0.5 $\pm$ 0.02]



TAPE AND REEL

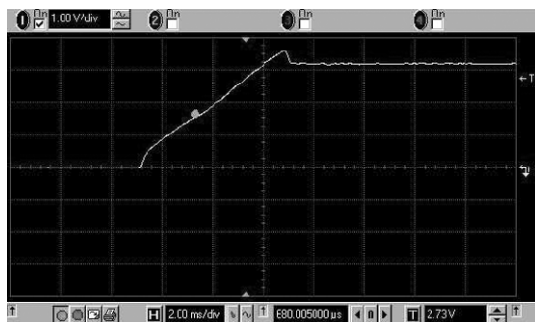
See Tape and Reel Information - Type B



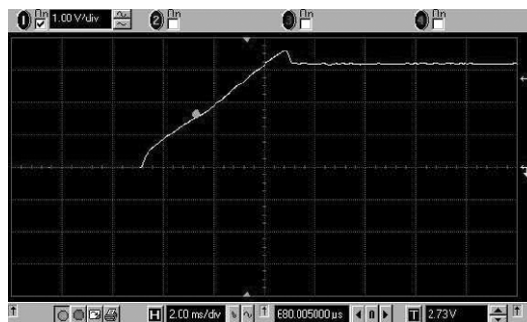
STANDARD ELECTRICAL SPECIFICATIONS					
PARAMETER	UNIT	CONDITION	MIN	TYP	MAX
Input					
Voltage Range	V _{DC}		2.5		6
Quiescent Current	μA	$\overline{\text{PSM}}$ mode		200	
Soft Start Time	ms	T _{SS}		6	
SD, PWM/$\overline{\text{PSM}}$, SYNC					
Logic High	V	V _H	2.4		
Logic Low	V	V _L			0.8
Normal Mode	μA	I _{DD}			750
$\overline{\text{PSM}}$ Mode	μA	I _{DD}			250
Shutdown Mode	μA	I _{DD}			1
Shutdown Time	ms	T _{SS}		5.5	
Insulation					
Test Voltage	V _{AC}	60Hz 60sec	750		
Resistance	Ω	V _{ISO} = 500 V _{DC}	1 x 10 ¹¹		
Leakage Current	nA	V _{ISO} = 500 V _{DC}			5
Output					
Power	W			15	
Voltage	V _{DC}			0.9 to 4.5	
Voltage Tolerance	%	at 25 °C Ambient Temperature	- 3		+3
Temp. Coefficient	%/°C				0.03
Ripple and Noise	mVpp	DC to 20 MHz		65	
General					
Package Weight	gr.				1.5
Oscillator					
Frequency	KHz			400	
SYNC Range		F _{SYNC} /F _{OSC}	1.2		1.5
Temperature					
Operation	°C		- 40		+ 85
Storage	°C		- 55		+ 125
Operating Junction	°C	T _J		150	
Thermal Impedance	°C/W _D *	Q _{JA}		82	

*Note: W_D = Power Dissipated

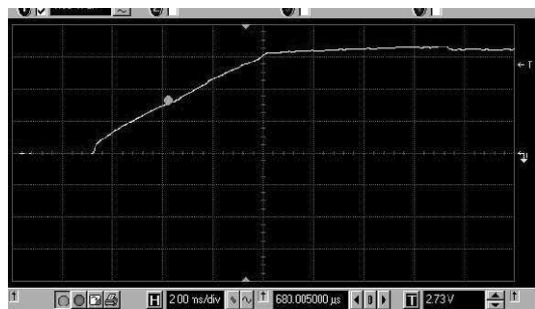
Rise Time



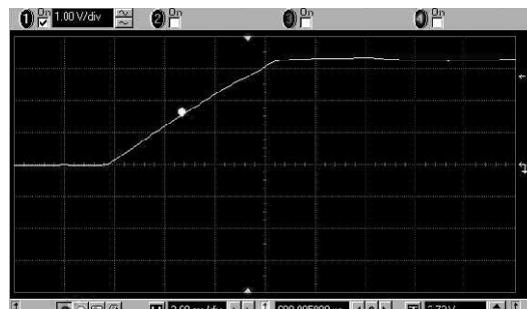
Rise Time (PWM mode): Vin = 6V; Vout = 3.3V; Iout = 4A



Fall Time (PWM mode): Vin = 6V; Vout = 3.3V; Iout = 1A

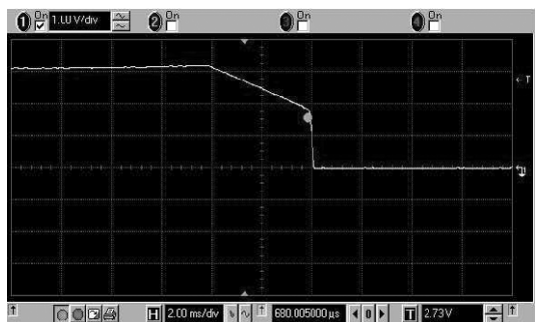


Rise Time (PWM mode): Vin = 4V; Vout = 3.3V; Iout = 4A

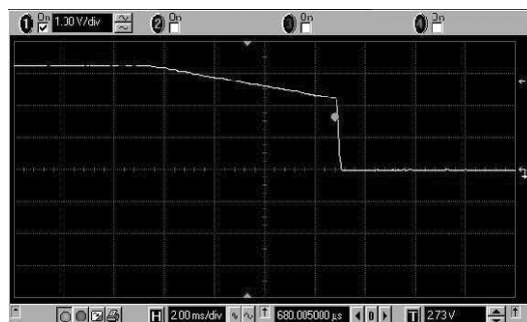


Fall Time (PWM mode): Vin = 4V; Vout = 3.3V; Iout = 1A

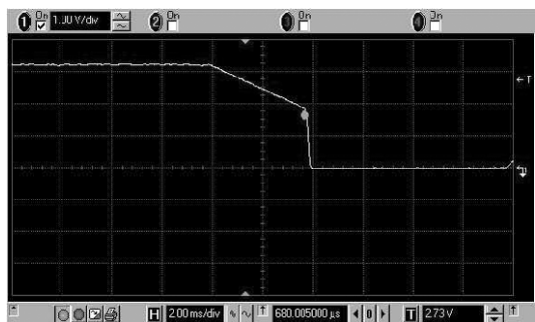
Fall Time



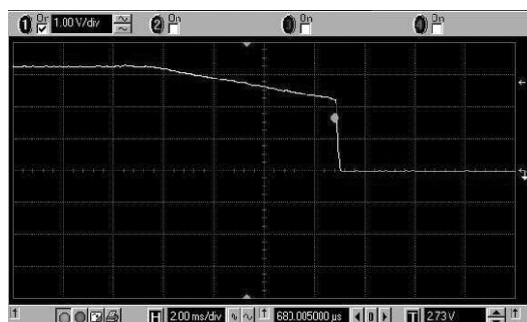
Fall Time (PWM mode): Vin = 4V; Vout = 3.3V; Iout = 4A



Fall Time (PWM mode): Vin = 4V; Vout = 3.3V; Iout = 1A



Fall Time (PWM mode): Vin = 4V; Vout = 3.3V; Iout = 4A

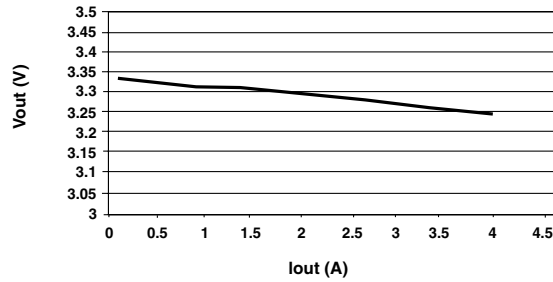


Fall Time (PWM mode): Vin = 4V; Vout = 3.3V; Iout = 1A

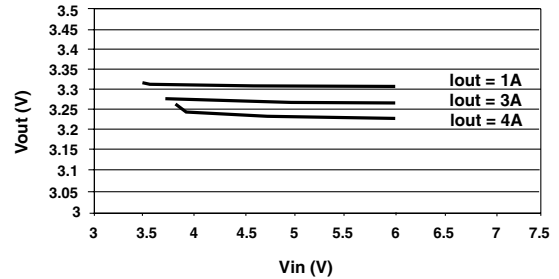


PWM Mode

Vout Vs. Iout*
Vin = 4V

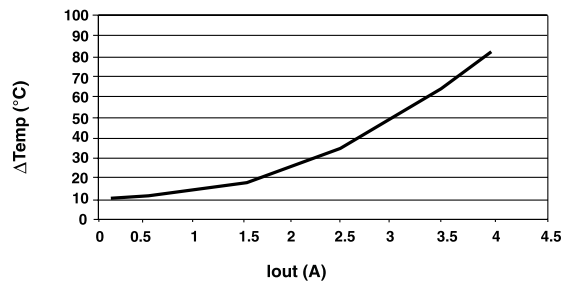


Vout Vs. Vin*

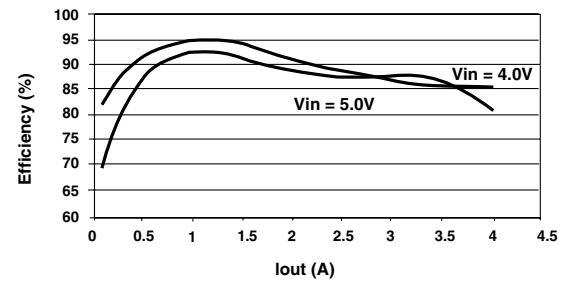


Temp Vs. Iout*

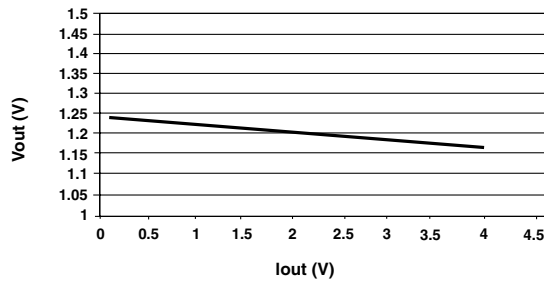
Above 25°C Ambient Temperature Vin = 6.0V; Vout = 3.3V



Efficiency Vs. Iout*Vs. Vin*
Vout = 3.3V



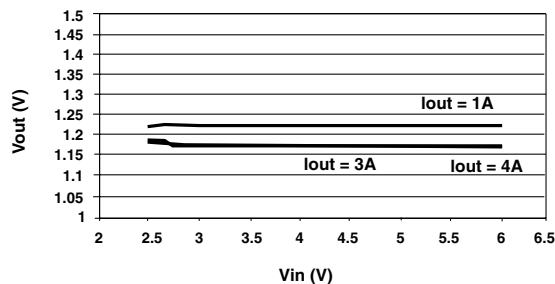
Vout Vs Iout*
Vin = 4V



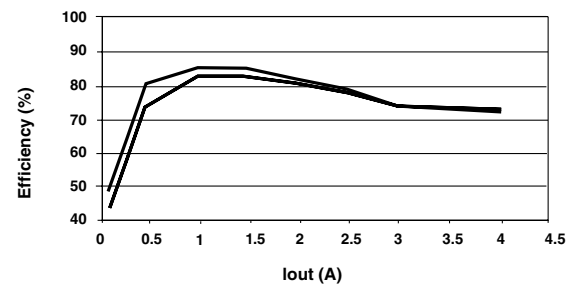
Temp Vs. Iout*
Above 25°C Ambient Temperature Vin = 6.0V;
Vout = 1.2V



Vout Vs. Vin*



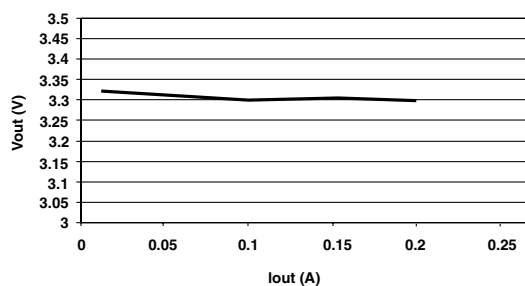
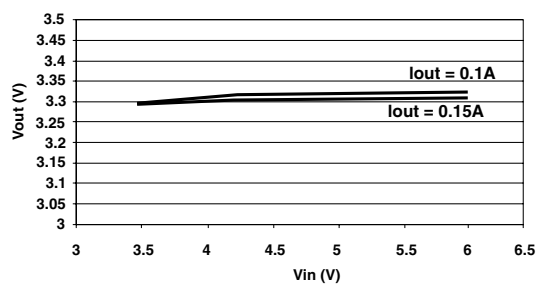
Efficiency Vs. Iout*
Vout = 1.2V



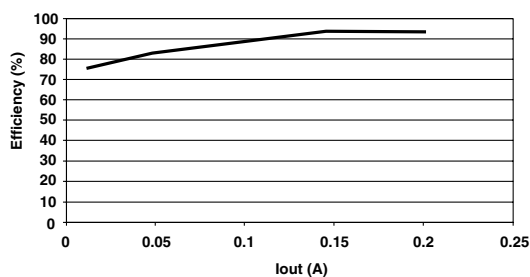
*Note: Measurements were taken with Power supply: ZUP 20-40 from Nemic Lambda; Electronic load: 6063B from Agilent; Multimeter: Fluke 45 from Fluke and 34401 digital multimeter from Agilent; Scope: Infiniium 54815A from Agilent.

PSM MODE**Vout Vs. Iout***

Vin = 4V

**Vout Vs. Vin*****Efficiency Vs. Iout** ***

Vin = 4.0V; Vout = 3.3V



*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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