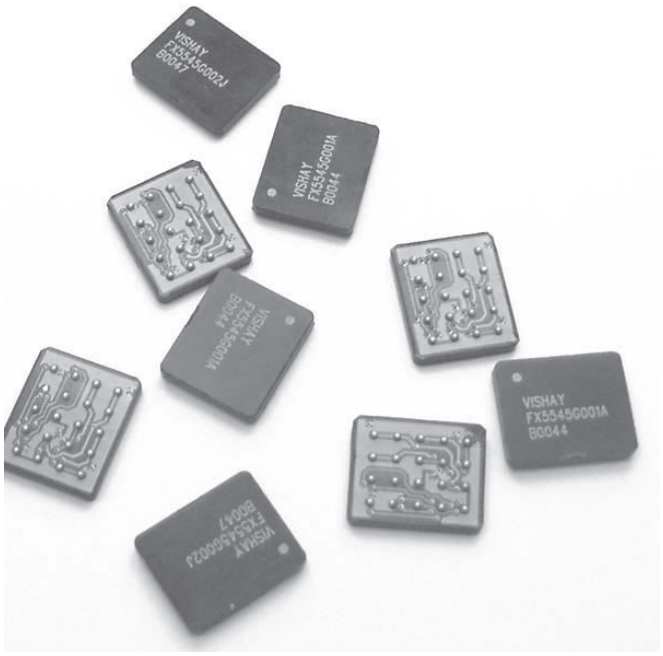
# Industry Smallest and Low Profile 8W 2.5A DC/DC Buck Converter with High Output Density Power




## FEATURES

- Fully integrated DC/DC converter
- High efficiency over large load range
- 100% duty cycle
- Power density - more than 300W/inch$^3$
- 1uA shutdown current
- 2.7V to 6V input range (1Li+ and 3-cell NiCd or NiMH cells)
- 1.5V to 3.6V output voltage
- Programmable PWM/$\overline{\text{PSM}}$ controls
- Low output ripple
- BGA/LGA construction
- Temperature range: - 40°C to + 85°C
- No external components needed
- Output power 8W
- Maximum current 2.5A
- Low profile

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 2.7V 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 sychronous 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, PDAs and others
- Supply voltage source for low-voltage chip sets
- Portable computers
- Battery back-up supplies
- Cameras
- Routers
- Fiber optics
- LANS
- Image processing

## ORDERING INFORMATION

**FX** **5545** **G205** ☐☐☐ ☐☐

FUNCTION

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

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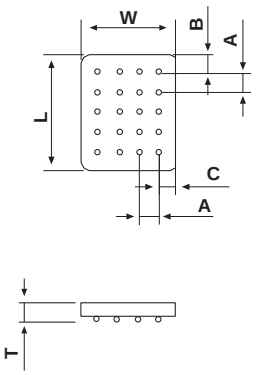
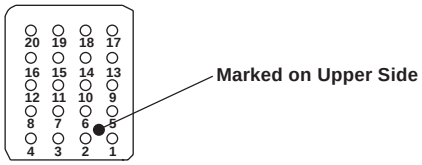
| DIMENSIONS in inches [millimeters] | |
|---|---|
| L | 0.58 ± 0.01<br>[14.7 ± 0.25] |
| W | 0.48 ± 0.01<br>[12.2 ± 0.25] |
| A | 0.1 ± 0.01<br>[2.54 ± 0.25] |
| B | 0.09 ± 0.01<br>[2.29 ± 0.25] |
| C | 0.09 ± 0.01<br>[2.27 ± 0.25] |
| T | 0.12 max<br>[3 max] |



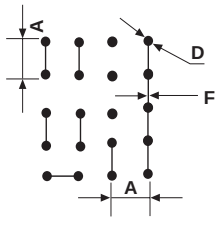

BOTTOM SIDE




***Note:** Pin Description application note is available on page 32.
****Note:** 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/$\overline{PSM}$ |
| 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<br>[2.54 ± 0.25] | 0.03 ± 0.001<br>[0.8 ± 0.02] | 0.02 ± 0.001<br>[0.5 ± 0.02] |



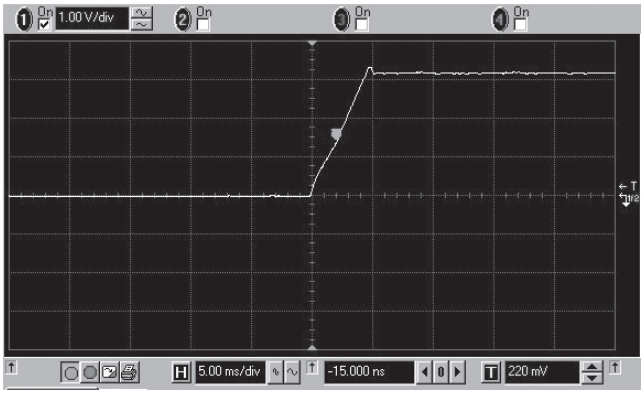

| TAPE AND REEL |
|---|
| See Tape and Reel Information - Type B |

## STANDARD ELECTRICAL SPECIFICATIONS

| PARAMETER | UNIT | CONDITION | MIN | TYP | MAX |
|---|---|---|---|---|---|
| **Input** | | | | | |
| Voltage Range | $V_{DC}$ | | 2.7 | | 6 |
| Quiescent Current | A | PSM mode | | 200 | |
| Soft Start Time | ms | $T_{SS}$ | | 5 | |
| **SD, PWM/PSM, SYNC** | | | | | |
| Logic High | V | $V_H$ | 2.4 | | |
| Logic Low | V | $V_L$ | | | 0.8 |
| Normal Mode | A | $I_{DD}$ | | | 750 |
| PSM Mode | A | $I_{DD}$ | | | 250 |
| Shutdowm Mode | A | $I_{DD}$ | | | 1 |
| Shutdown Time | ms | $T_{SS}$ | | 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 | | | 8 | |
| Voltage | $V_{DC}$ | | | 1.5 to 3.6 | |
| Voltage Tolerance | % | at 25°C Ambient Temperature | - 3 | | 3 |
| Temp. Coefficient | %/°C | | | | 0.03 |
| Ripple and Noise | mVpp | DC to 20MHz | | 130 | |
| | mVpp | With 10µF output capacitor | | 90 | |
| **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 Temp. | °C | $T_j$ | | 150 | |
| Thermal Impedance | °C/WD* | $\theta_{JA}$ | | 82 | |

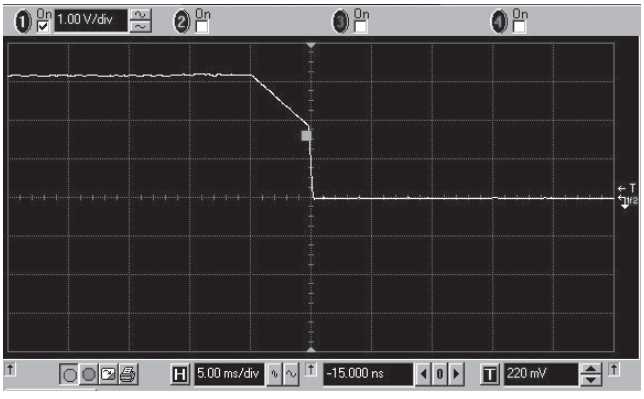
**Note:** $W_D$ = Power Dissipated

### Rise Time




**Rise Time (PWM mode): Vin = 6V; Vout = 3.3V; Iout = 2.5A**

### Fall Time




**Fall Time (PWM mode): Vin = 6V; Vout = 3.3V; Iout = 2.5A**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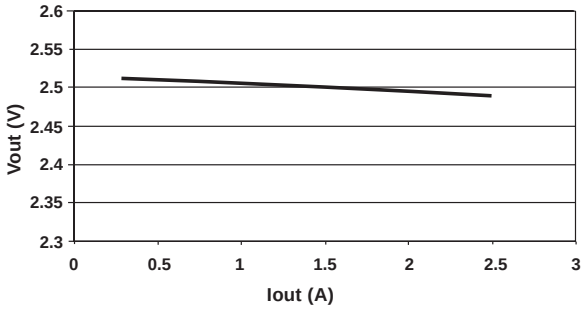
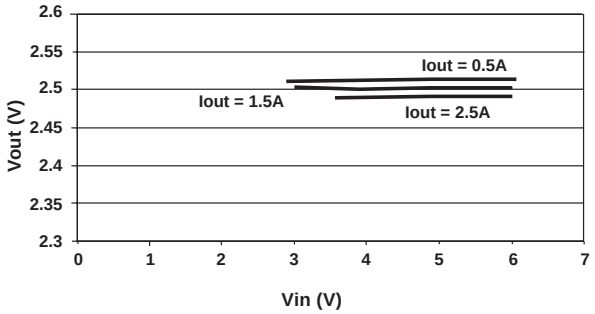
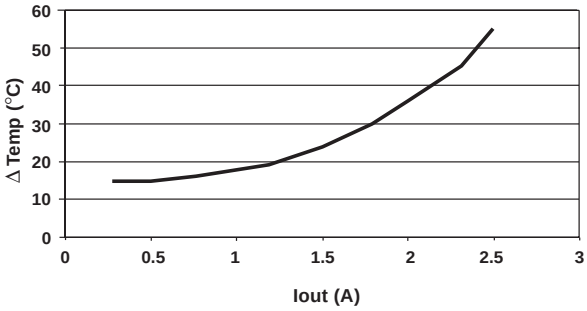
### Vout Vs. Iout
**For Vin = 3.6V; Vout = 2.5V**



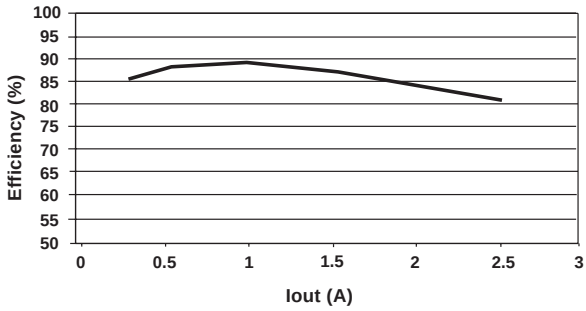

### Vout Vs. Vin



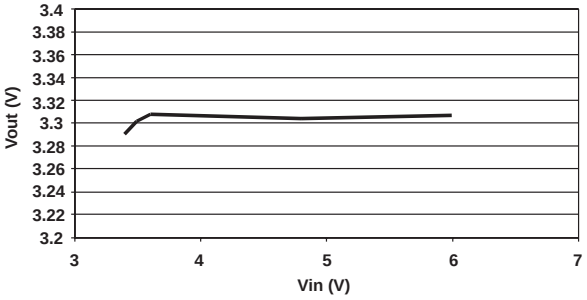

### ∆ Temp. Vs. Iout
**Above 25°C Ambient Temperature; For Vin = 6V**



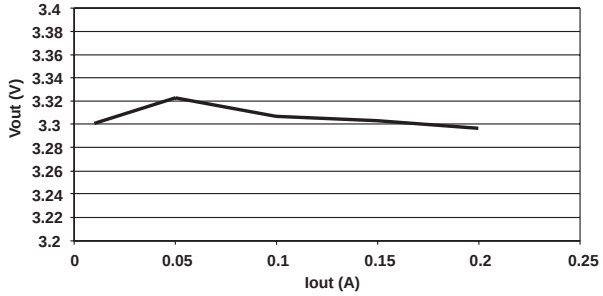

### Efficiency Vs. Iout
**For Vin = 3.6V; Vout = 2.5V**




### Vout Vs. Vin (PSM mode)
**Iout = 0.1A**




### Vout Vs. Iout (PSM mode)
**Vin = 6V**




### Efficiency Vs. Iout (PSM mode)