

# FDD5670

## 60V N-Channel PowerTrench™ MOSFET

### General Description

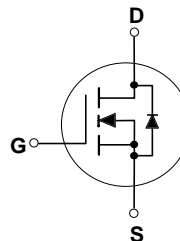
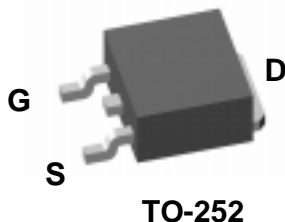
This N-Channel MOSFET has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers.

These MOSFETs feature faster switching and lower gate charge than other MOSFETs with comparable  $R_{DS(ON)}$  specifications.

The result is a MOSFET that is easy and safer to drive (even at very high frequencies), and DC/DC power supply designs with higher overall efficiency.

### Features

- 48 A, 60 V.  $R_{DS(ON)} = 0.015 \Omega @ V_{GS} = 10 \text{ V}$   
 $R_{DS(ON)} = 0.018 \Omega @ V_{GS} = 6 \text{ V}$ .
- Low gate charge.
- Fast switching speed.
- High performance trench technology for extremely low  $R_{DS(ON)}$ .



### Absolute Maximum Ratings T<sub>C</sub>=25°C unless otherwise noted

Symbol	Parameter	Ratings	Units
$V_{DSS}$	Drain-Source Voltage	60	V
$V_{GSS}$	Gate-Source Voltage	±20	V
$I_D$	Maximum Drain Current -Continuous (Note 1)	48	A
	(Note 1a)	10	
$P_D$	Maximum Drain Current -Pulsed	100	W
	Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$ (Note 1)	70	
	$T_A = 25^\circ\text{C}$ (Note 1a)	2.8	
	$T_A = 25^\circ\text{C}$ (Note 1b)	1.3	
$T_J, T_{stg}$	Operating and Storage Junction Temperature Range	-55 to +150	°C

### Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance, Junction-to- Case (Note 1)	1.8	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to- Ambient (Note 1b)	96	°C/W

### Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape width	Quantity
FDD5670	FDD5670	13"	16mm	2500

## Electrical Characteristics T<sub>c</sub>=25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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### OFF CHARACTERISTICS

BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	60			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 48 V, V <sub>GS</sub> = 0 V			1	μA
I <sub>GSSF</sub>	Gate-Body Leakage, Forward	V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0 V			100	nA
I <sub>GSSR</sub>	Gate-Body Leakage, Reverse	V <sub>GS</sub> = -20 V, V <sub>DS</sub> = 0 V			-100	nA

### ON CHARACTERISTICS (Note 2)

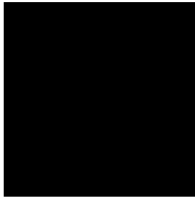
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	2		4	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 A V <sub>GS</sub> = 6 V, I <sub>D</sub> = 9 A			0.015 0.018	Ω

### DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

I <sub>S</sub>	Maximum Continuous Drain-Source Diode Forward Current				48	A
V <sub>SD</sub>	Drain-Source Diode Forward Voltage	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 2.4 A			1.2	V

**Notes:**

- R<sub>θJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the drain tab. R<sub>θJC</sub> is guaranteed by design while R<sub>θCA</sub> is determined by the user's board design.



- a) R<sub>θJA</sub> = 45°C/W when mounted on a 1 in<sup>2</sup> pad of 2oz copper.

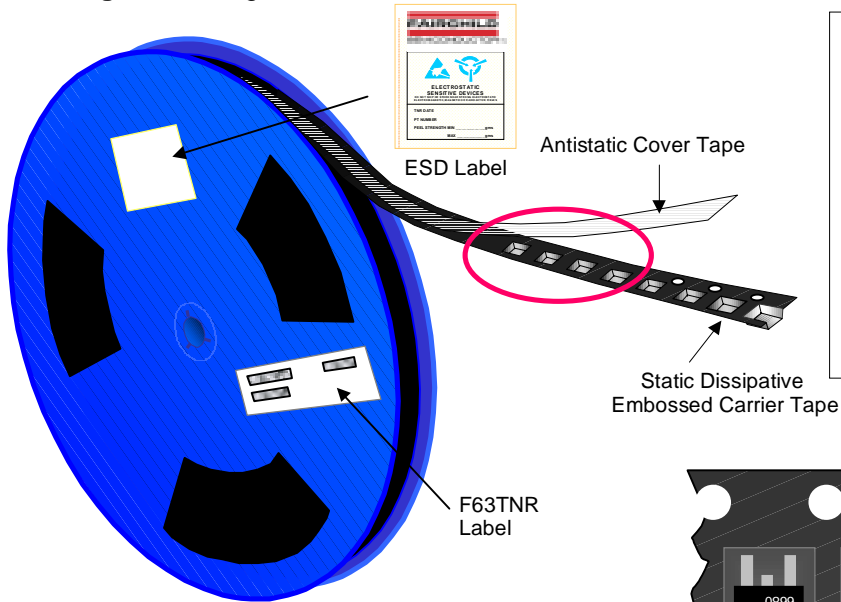


- b) R<sub>θJA</sub> = 96°C/W when mounted on a 0.076 in<sup>2</sup> pad of 2oz copper.

Scale 1 : 1 on letter size paper

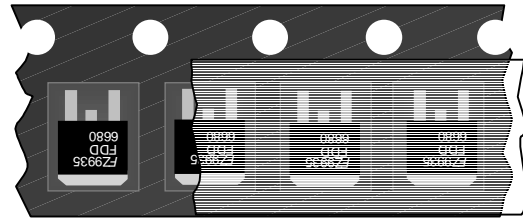
- Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

## D-PAK (TO-252) Packaging Configuration: Figure 1.0



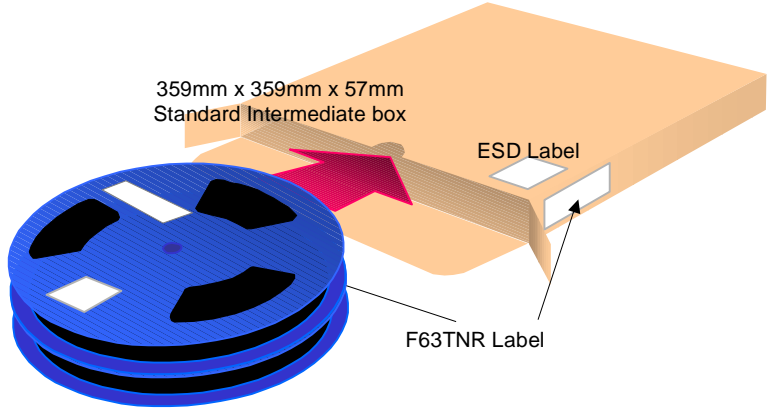
**Packaging Description:**  
 TO-252 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2500 units per 13" or 330cm diameter reel. The reels are dark blue in color and is made of polystyrene plastic (anti-static coated). This and some other options are further described in the Packaging Information table.

These full reels are individually barcode labeled and placed inside a standard intermediate box (illustrated in figure 1.0) made of recyclable corrugated brown paper. One box contains two reels maximum. And these boxes are placed inside a barcode labeled shipping box which comes in different sizes depending on the number of parts shipped.



**D-PAK (TO-252) Unit Orientation**

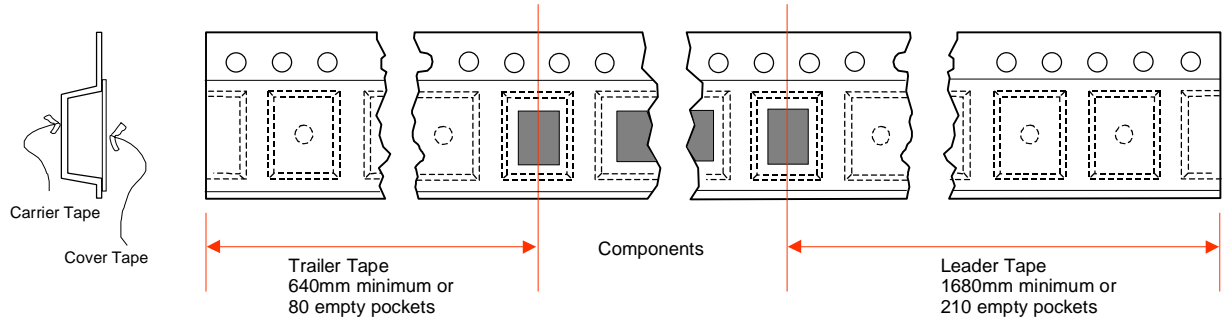
D-PAK (TO-252) Packaging Information	
Packaging Option	Standard (no flow code)
Packaging type	TNR
Qty per Reel/Tube/Bag	2,500
Reel Size	13" Dia
Box Dimension (mm)	359x359x57
Max qty per Box	5,000
Weight per unit (gm)	0.300
Weight per Reel(kg)	1.200
Note/Comments	



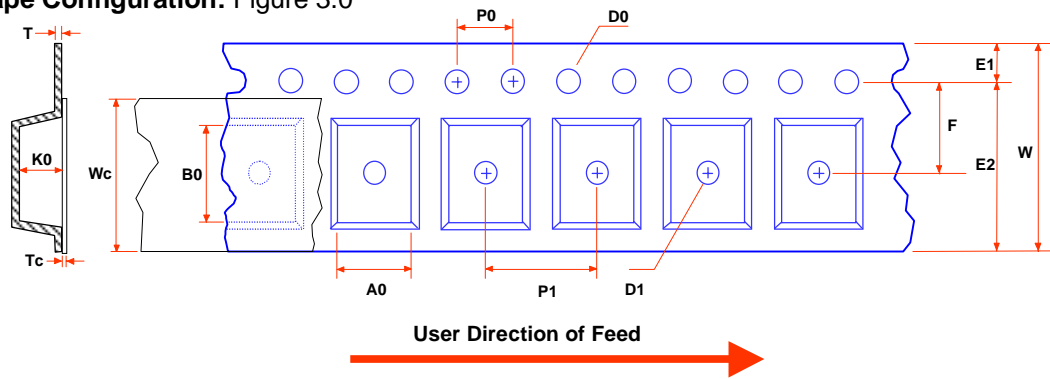
F63TNR Label sample

LOT: CBVK741B019	QTY: 2500	
FSID: FDD6680	SPEC:	
D/C1: Z9942	QTY1:	SPEC REV:
D/C2:	QTY2:	CPN:
		N/F: F (F63TNR)3

## TO-252 (D-PAK) Tape Leader and Trailer Configuration: Figure 2.0

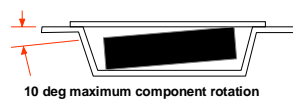


## D-PAK (TO-252) Embossed Carrier Tape Configuration: Figure 3.0

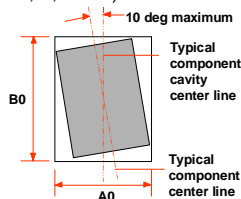


Dimensions are in millimeter														
Pkg type	A0	B0	W	D0	D1	E1	E2	F	P1	P0	K0	T	Wc	Tc
<b>TO252</b> (24mm)	6.90 +/-0.10	10.50 +/-0.10	16.0 +/-0.3	1.55 +/-0.05	1.5 +/-0.10	1.75 +/-0.10	14.25 min	7.50 +/-0.10	8.0 +/-0.1	4.0 +/-0.1	2.65 +/-0.10	0.30 +/-0.05	13.0 +/-0.3	0.06 +/-0.02

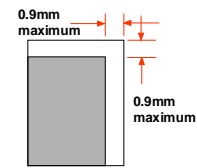
Notes: A0, B0, and K0 dimensions are determined with respect to the EIA/Jedec RS-481 rotational and lateral movement requirements (see sketches A, B, and C).



Sketch A (Side or Front Sectional View)  
Component Rotation

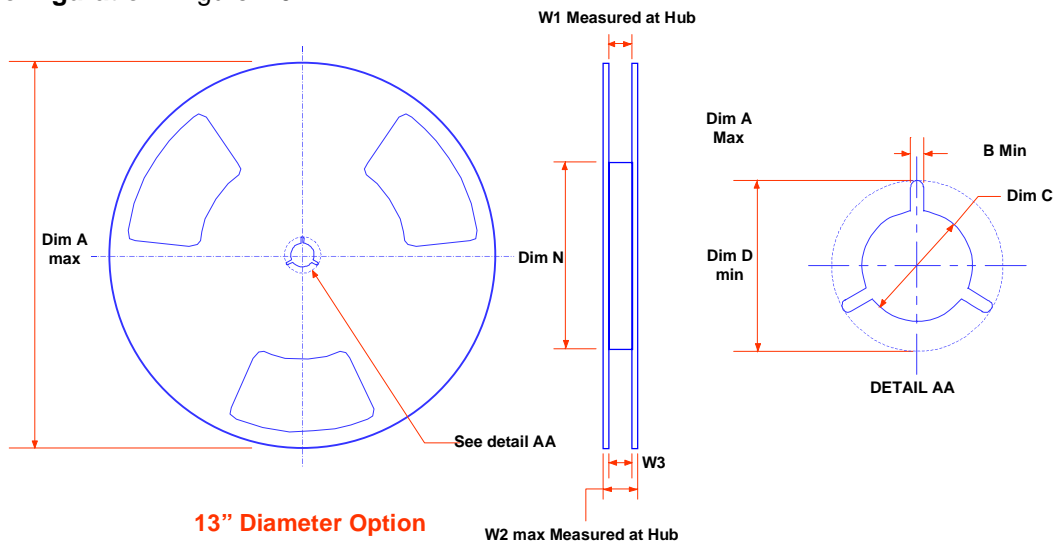


Sketch B (Top View)  
Component Rotation



Sketch C (Top View)  
Component lateral movement

## D-PAK (TO-252) Reel Configuration: Figure 4.0



Dimensions are in inches and millimeters									
Tape Size	Reel Option	Dim A	Dim B	Dim C	Dim D	Dim N	Dim W1	Dim W2	Dim W3 (LSL-USL)
164mm	13" Dia	13.00 330	0.059 1.5	512 +0.020/-0.008 13 +0.5/-0.2	0.795 20.2	4.00 100	0.646 +0.078/-0.000 16.4 +2/0	0.882 22.4	0.626 - 0.764 15.9 - 19.4

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CROSSVOLT™	POP™	UHC™
E <sup>2</sup> CMOS™	PowerTrench®	VCX™
FACT™	QFET™	
FACT Quiet Series™	QS™	
FAST®	Quiet Series™	
FASTr™	SuperSOT™-3	
GTO™	SuperSOT™-6	
HiSeC™	SuperSOT™-8	

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