

FDD6030BL

N-Channel PowerTrench™ MOSFET

General Description

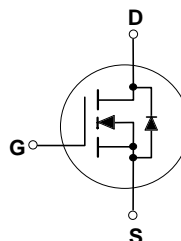
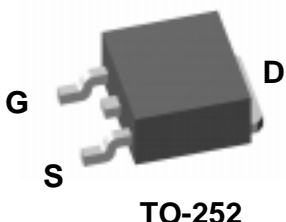
This N-Channel Logic level MOSFET is produced using Fairchild Semiconductor's advanced PowerTrench process that has been especially tailored to minimize the on-state resistance and yet maintain low gate charge for superior switching performance.

Applications

- DC/DC converter
- Motor drives

Features

- 35 A, 30 V. $R_{DS(ON)} = 0.018 \Omega @ V_{GS} = 10 \text{ V}$
 $R_{DS(ON)} = 0.025 \Omega @ V_{GS} = 4.5 \text{ V}$.
- Low gate charge.
- Fast switching speed.
- High performance trench technology for extremely low $R_{DS(ON)}$.



Absolute Maximum Ratings T_c=25°C unless otherwise noted

| Symbol | Parameter | Ratings | Units |
|-----------------------------------|------------------------------------------------------------|-------------|-------|
| V _{DSS} | Drain-Source Voltage | 30 | V |
| V _{GSS} | Gate-Source Voltage | ±20 | V |
| I _D | Maximum Drain Current -Continuous (Note 1) | 35 | A |
| | (Note 1a) | 9 | |
| P _D | Maximum Drain Current -Pulsed | 100 | W |
| | Maximum Power Dissipation @ T _c = 25°C (Note 1) | 44 | |
| | T _A = 25°C (Note 1a) | 2.8 | |
| | T _A = 25°C (Note 1b) | 1.3 | |
| T _J , T _{stg} | Operating and Storage Junction Temperature Range | -55 to +150 | °C |

Thermal Characteristics

| | | | |
|------------------|----------------------------------------------------|-----|------|
| R _{θJC} | Thermal Resistance, Junction-to- Case (Note 1) | 2.8 | °C/W |
| R _{θJA} | Thermal Resistance, Junction-to- Ambient (Note 1b) | 96 | °C/W |

Package Marking and Ordering Information

| Device Marking | Device | Reel Size | Tape width | Quantity |
|----------------|-----------|-----------|------------|----------|
| FDD6030BL | FDD6030BL | 13" | 16mm | 2500 |

Electrical Characteristics T_c=25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|--------|-----------|-----------------|-----|-----|-----|-------|
|--------|-----------|-----------------|-----|-----|-----|-------|

OFF CHARACTERISTICS

| | | | | | | |
|--------------------|---------------------------------|------------------------------------------------|----|--|------|----|
| B _V DSS | Drain-Source Breakdown Voltage | V _{GS} = 0 V, I _D = 250 μA | 30 | | | V |
| I _D SS | Zero Gate Voltage Drain Current | V _{DS} = 24 V, V _{GS} = 0 V | | | 1 | μA |
| I _G SSF | Gate-Body Leakage, Forward | V _{GS} = 20 V, V _{DS} = 0 V | | | 100 | nA |
| I _G SSR | Gate-Body Leakage, Reverse | V _{GS} = -20 V, V _{DS} = 0 V | | | -100 | nA |

ON CHARACTERISTICS (Note 2)

| | | | | | | |
|----------------------|-----------------------------------|-------------------------------------------------------------------------------------------------|---|--|----------------|---|
| V _{GS} (TH) | Gate Threshold Voltage | V _{DS} = V _{GS} , I _D = 250 μA | 1 | | 3 | V |
| R _D (ON) | Static Drain-Source On-Resistance | V _{GS} = 10 V, I _D = 9 A V _{GS} = 4.5 V, I _D = 7.5 A | | | 0.018 0.025 | Ω |

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

| | | | | | | |
|-----------------|-------------------------------------------------------|-----------------------------------------------|--|--|-----|---|
| I _S | Maximum Continuous Drain-Source Diode Forward Current | | | | 2.3 | A |
| V _{SD} | Drain-Source Diode Forward Voltage | V _{GS} = 0 V, I _S = 2.3 A | | | 1.3 | V |

Notes:

- R_{θJA} is the sum of the junction-to-case and case-to-ambient resistance where the case thermal reference is defined as the drain tab. R_{θJC} is guaranteed by design while R_{θJA} is determined by the user's board design.



- a) R_{θJA} = 45°C/W when mounted on a 1in² pad of 2oz copper.

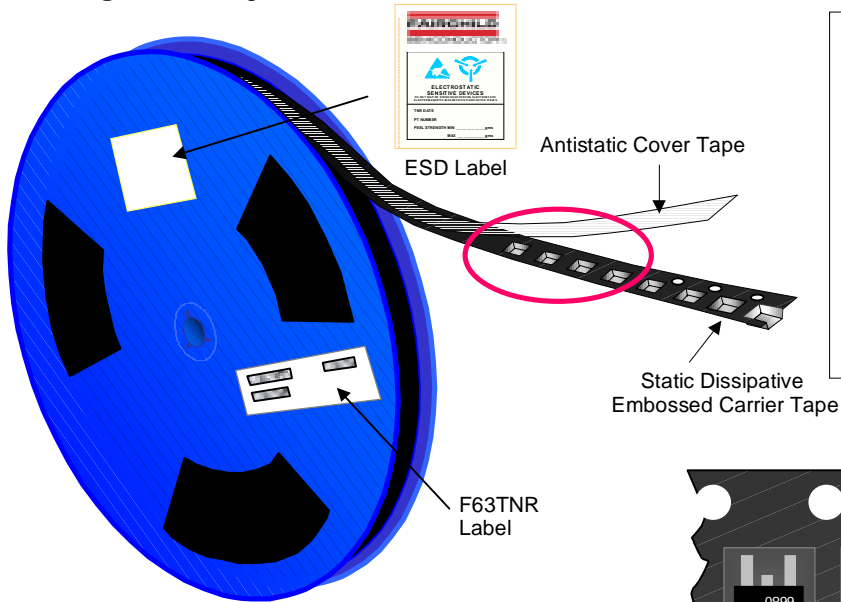


- b) R_{θJA} = 96°C/W when mounted on a minimum pad.

Scale 1 : 1 on letter size paper

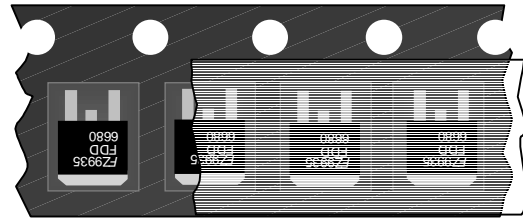
- Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

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



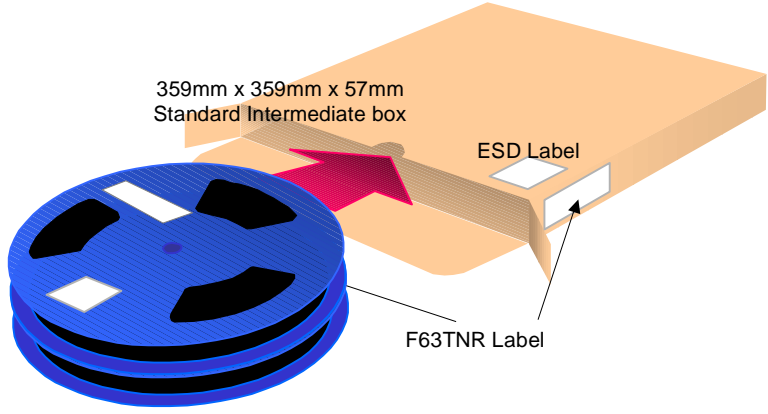
Packaging Description:
 TO-252 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. 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

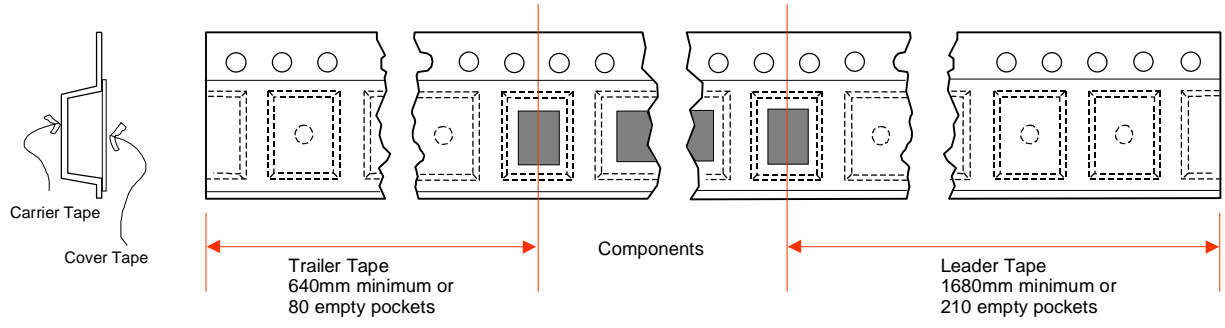
| D-PAK (TO-252) Packaging Information | |
|--------------------------------------|-------------------------|
| Packaging Option | Standard (no flow code) |
| Packaging type | TNR |
| Qty per Reel/Tube/Bag | 2,500 |
| Reel Size | 13" Dia |
| Box Dimension (mm) | 359x359x57 |
| Max qty per Box | 5,000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



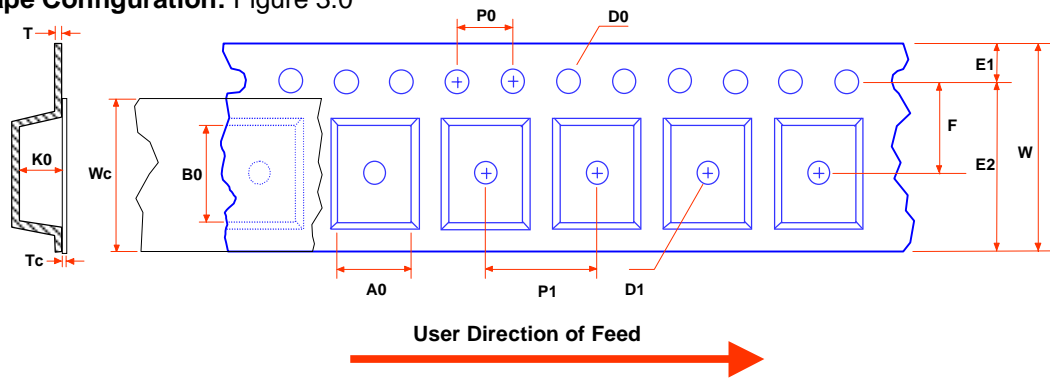
F63TNR Label sample

| | | |
|------------------|-----------|------------------|
| 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

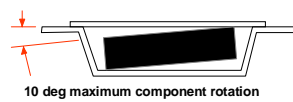


D-PAK (TO-252) Embossed Carrier Tape Configuration: Figure 3.0

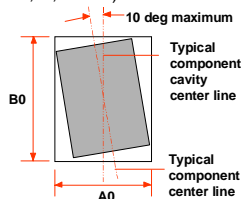


| Dimensions are in millimeter | | | | | | | | | | | | | | |
|------------------------------|-----------------|------------------|----------------|-----------------|----------------|-----------------|--------------|-----------------|---------------|---------------|-----------------|-----------------|----------------|-----------------|
| Pkg type | A0 | B0 | W | D0 | D1 | E1 | E2 | F | P1 | P0 | K0 | T | Wc | Tc |
| TO252 (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 |

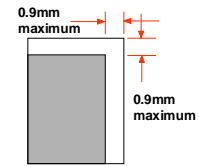
Notes: A0, B0, and K0 dimensions are determined with respect to the EIA/Jedec RS-481 rotational and lateral movement requirements (see sketches A, B, and C).



Sketch A (Side or Front Sectional View)
Component Rotation

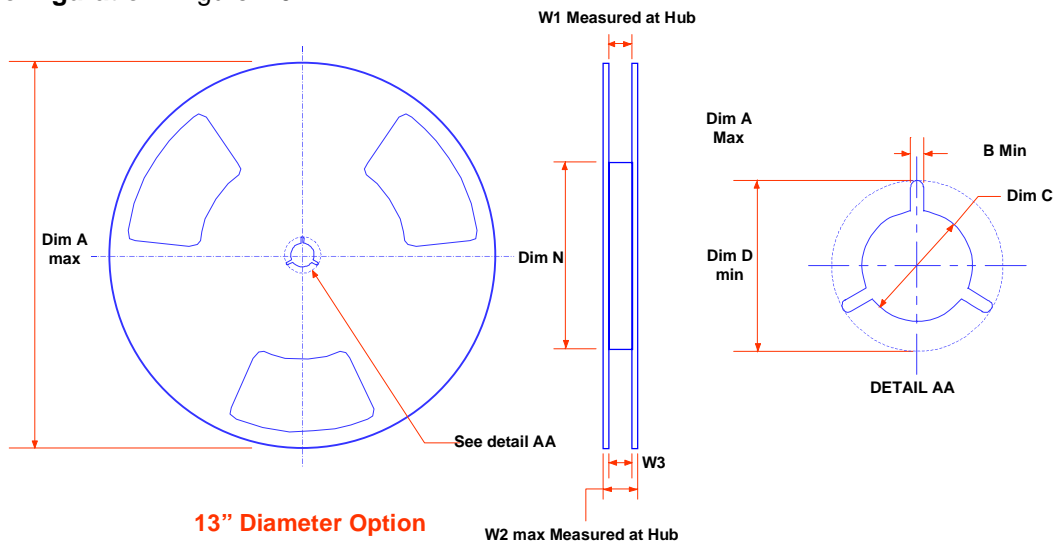


Sketch B (Top View)
Component Rotation



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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| FACT™ | QFET™ | |
| FACT Quiet Series™ | QS™ | |
| FAST® | Quiet Series™ | |
| FASTr™ | SuperSOT™-3 | |
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|--------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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