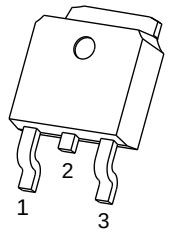
# FTK40P03D

## 30V P-Channel MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)}$MAX | $I_D$ |
|---|---|---|
| -30V | 15mΩ@-10V | -40A |

**TO-252**




1. GATE
2. DRAIN
3. SOURCE

### GENERAL DESCRIPTION

The FTK40P03D uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.

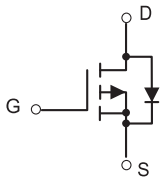
### FEATURE

- $V_{DS}$ =-30V,$I_D$ =-40A
  $R_{DS(on)}$ <15mΩ @ $V_{GS}$=-10V (Typ:10mΩ)
- Advanced trench process technology
- Reliable and rugged
- High density cell design for ultra low On-Resistance

### APPLICATION

- Power management in notebook computer
- Portable equipment and battery powered systems

### EQUIVALENT CIRCUIT




### Maximum ratings ($T_a$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | |
| Continuous Drain Current | $I_D$ ① | -40 | A |
| Pulsed Drain Current | $I_{DM}$ ② | -160 | |
| Single Pulsed Avalanche Energy | $E_{AS}$ ③ | 200 | mJ |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature Range | $T_{STG}$ | -55 ~+150 | |
| Maximum lead temperature for soldering purposes, 1/8"from case for 5 seconds | $T_L$ | 260 | |

## ELECTRICAL CHARACTERISTICS(Ta =25℃ unless otherwise specified)

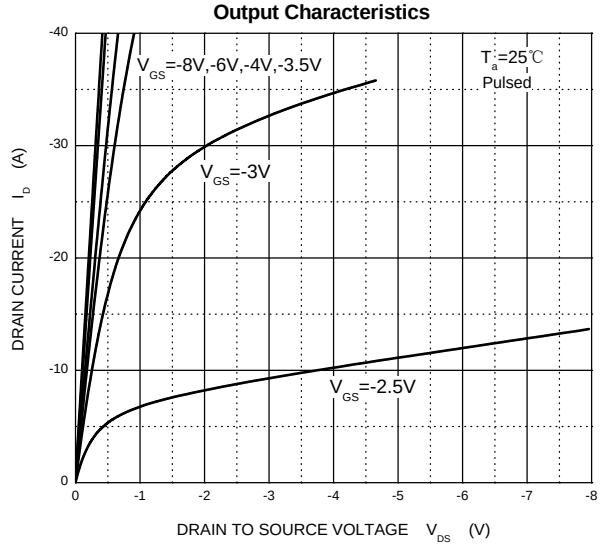
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Off characteristics | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)\ DSS}$ | $V_{GS}$ = 0V, $I_D$ =-250μA | -30 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ = -30V, $V_{GS}$ =0V | | | -1 | μA |
| Gate-body leakage current | $I_{GSS}$ | $V_{DS}$ =0V, $V_{GS}$ =±20V | | | ±100 | nA |
| On characteristics ④ | | | | | | |
| Gate-threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =-250μA | -1 | -1.6 | -2.5 | V |
| Static drain-source on-sate resistance | $R_{DS(on)}$ | $V_{GS}$ =-10V, $I_D$ =-20A | | 10 | 15 | mΩ |
| | $R_{DS(on)}$ | $V_{GS}$ =-4.5V, $I_D$ =-15A | | 14 | 25 | mΩ |
| Dynamic characteristics ④⑤ | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{DS}$ =-15V,$V_{GS}$ =0V, f =1MHz | | 2380 | | pF |
| Output capacitance | $C_{oss}$ | | | 385 | | |
| Reverse transfer capacitance | $C_{rss}$ | | | 288 | | |
| Switching characteristics ④⑤ | | | | | | |
| Total gate charge | $Q_g$ | $V_{DS}$=-15V, $V_{GS}$=-10V, $I_D$=-12A | | 40 | | nC |
| Gate-source charge | $Q_{gs}$ | | | 7.5 | | |
| Gate-drain charge | $Q_{gd}$ | | | 10 | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}$=-15V,$V_{GS}$=-10V, $R_G$=15Ω, $R_L$=2.5 Ω | | 11 | | ns |
| Turn-on rise time | $t_r$ | | | 24 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 35 | | |
| Turn-off fall time | $t_f$ | | | 10 | | |
| Drain-Source Diode Characteristics | | | | | | |
| Drain-source diode forward voltage(note1) | $V_{SD}$ ④ | $V_{GS}$ =0V, $I_S$=-10A | | | -1.2 | V |
| Continuous drain-source diode forward current | $I_S$ ① | | | | -40 | A |
| Pulsed drain-source diode forward current | $I_{SM}$ ② | | | | -160 | A |

Notes:

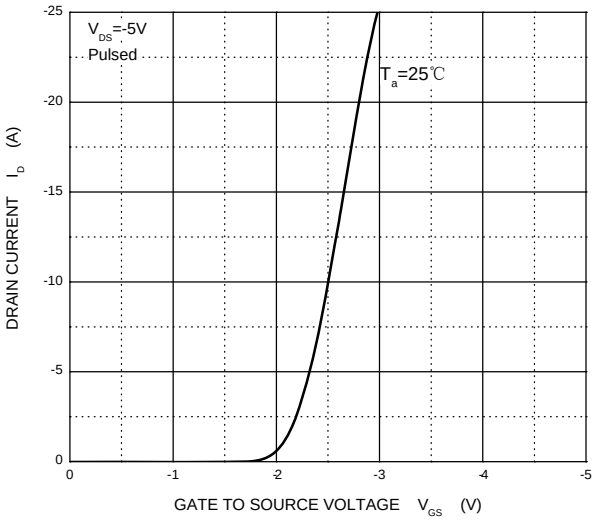
1.$T_C$=25℃ Limited only by maximum temperature allowed.
2.$P_W$≤10μs, Duty cycle≤1%.
3.EAS condition: $V_{DD}$=-15V,$V_{GS}$=-10V, L=0.5mH, Rg=25Ω Starting $T_J$ = 25℃.
4.Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.
5.Guaranteed by design, not subject to production.

## Typical Characteristics

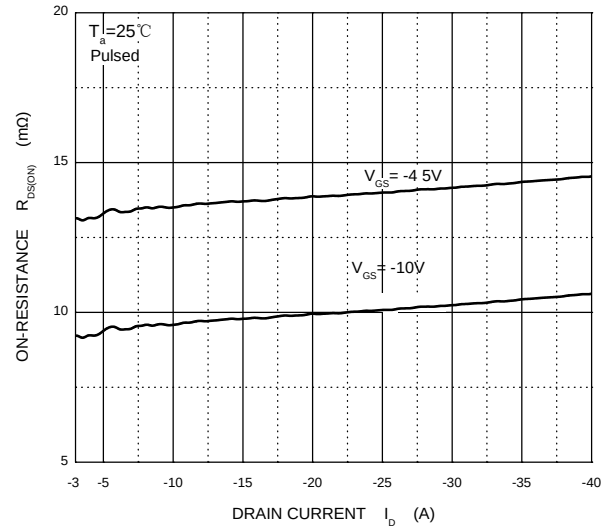
**Output Characteristics**



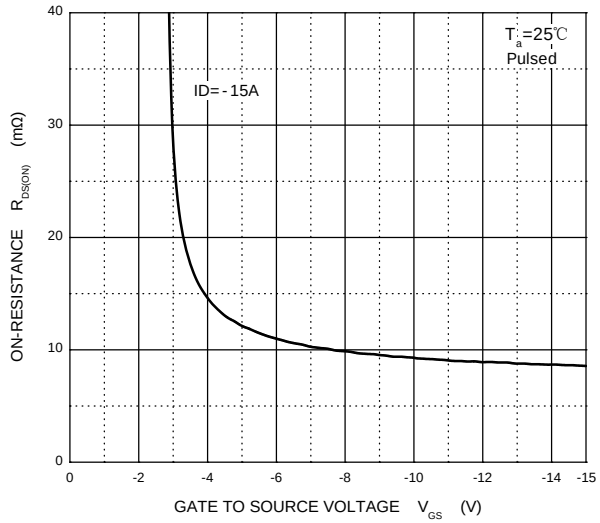

**Transfer Characteristics**



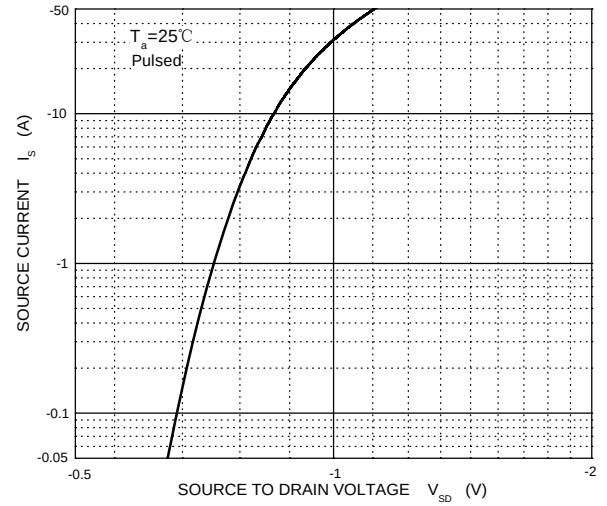

**$R_{DS(ON)}$ —— $I_D$**



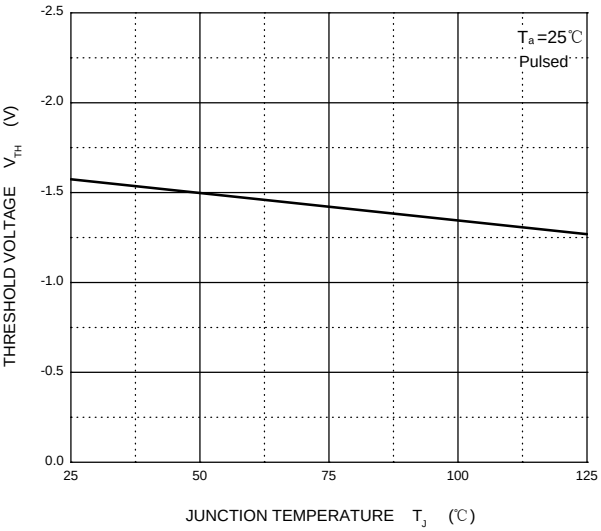

**$R_{DS(ON)}$—— $V_{GS}$**



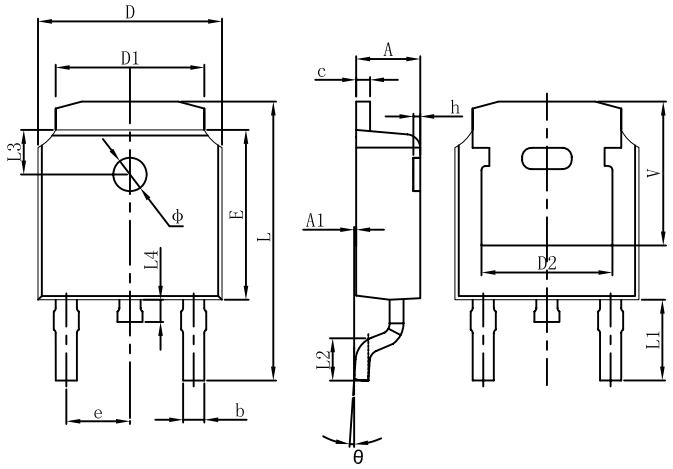

**$I_S$ —— $V_{SD}$**




**Threshold Voltage**

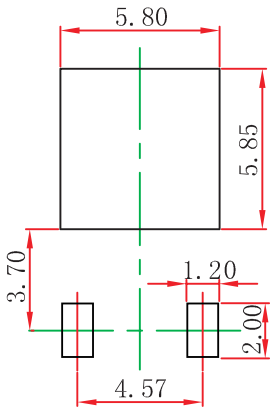


## TO-252 Package Outline Dimensions




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 2 200 | 2.400 | 0.087 | 0.094 |
| A1 | 0 000 | 0.127 | 0.000 | 0.005 |
| b | 0.635 | 0.770 | 0.025 | 0.030 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 4 830 REF. | | 0.190 REF. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.712 | 10 312 | 0.382 | 0.406 |
| L1 | 2 900 REF. | | 0.114 REF. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 REF. | | 0 063 REF. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| Φ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5 250 REF. | | 0 207 REF. | |

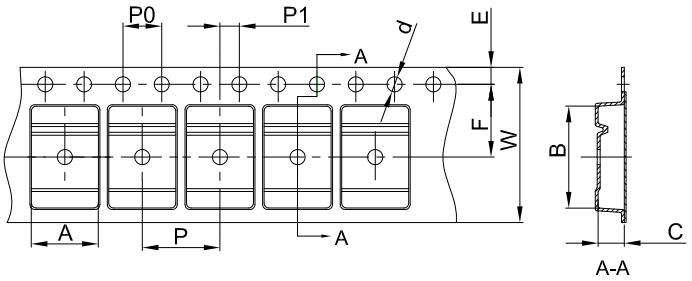
## TO-252 Suggested Pad Layout




Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

## TO-252 Tape and Reel

### TO-252 Embossed Carrier Tape

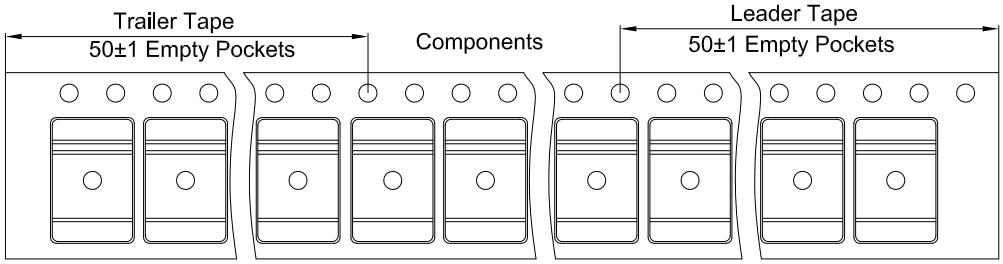



Packaging Description:

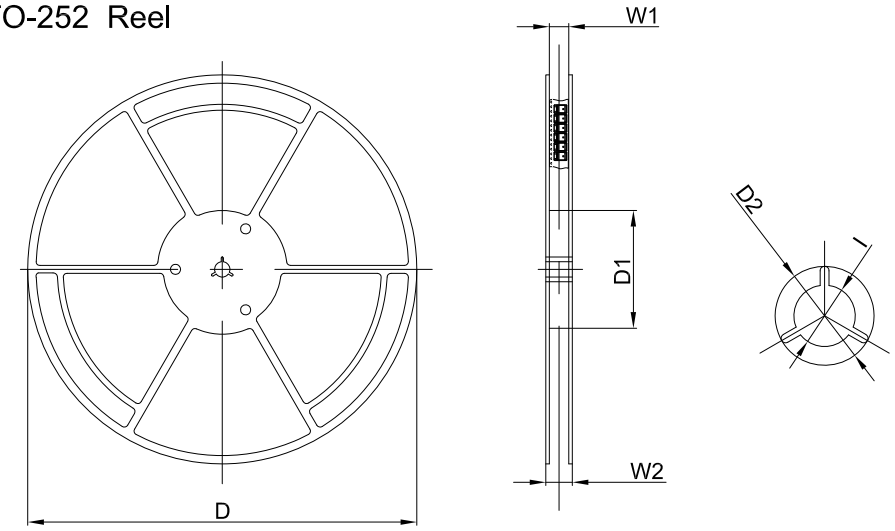
TO-252 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 25,00 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

| Dimensions are in millimeter | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pkg type | A | B | C | d | E | F | P0 | P | P1 | W |
| TO-252 | 6.90 | 10.50 | 2.70 | Ø1.55 | 1.75 | 7.50 | 4.00 | 8.00 | 2.00 | 16.00 |

### TO-252 Tape Leader and Trailer




### TO-252 Reel




| Dimensions are in millimeter | | | | | | |
|---|---|---|---|---|---|---|
| Reel Option | D | D1 | D2 | W1 | W2 | I |
| 13"Dia | 330.00 | 100.00 | Ø21.00 | 16.40 | 21.00 | Ø13.00 |

| REEL | Reel Size | Box | Box Size(mm) | Carton | Carton Size(mm) | G.W.(kg) |
|---|---|---|---|---|---|---|
| 2,500 pcs | 13inch | 2,500 pcs | 340×336×29 | 25,000 pcs | 353×346×365 | |