

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced VD MOSFETS

Product Summary



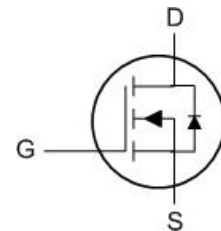
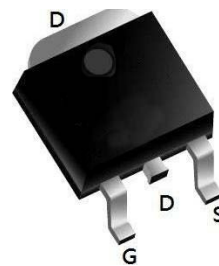
| BVDSS | RDSON | ID |
|-------|-------|----|
| 500V | 2.8Ω | 3A |

Description

The YÜ3P50FR is the Advanced VD N-ch MOSFETS, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The YÜ3P50FR meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

TO252-3L Pin Configuration



Absolute Maximum Ratings

| Symbol | Parameter | Value | Units |
|-----------------------------------|---|-------------|-------|
| V _{DSS} | Drain-Source Voltage | 500 | V |
| I _D | Drain Current - Continuous (TC= 25°C) - Continuous (TC= 100°C) | 3 | A |
| | | 1.8 | A |
| I _{DM} | Drain Current - Pulsed (Note 1) | 12 | A |
| V _{GSS} | Gate-Source Voltage | ± 30 | V |
| E _{AS} | Single Pulsed Avalanche Energy (Note 2) | 67 | mJ |
| I _{AR} | Avalanche Current (Note 1) | 5 | A |
| E _{AR} | Repetitive Avalanche Energy (Note 1) | 63 | mJ |
| dv/dt | Peak Diode Recovery dv/dt (Note 3) | 5 | V/ns |
| P _D | Power Dissipation (TC = 25°C) - Derate above 25°C | 100 | W |
| | | 0.2 | W/°C |
| T _j , T _{stg} | Operating and Storage Temperature Range | -55 to +150 | °C |
| T _L | Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds | 300 | °C |

Thermal Characteristics

| Symbol | Parameter | Value | Units |
|------------------|---|-------|-------|
| R _{θJC} | Thermal Resistance, Junction-to-Case | 1.25 | °C/W |
| R _{θJS} | Thermal Resistance, Case-to-Sink Typ. | -- | °C/W |
| R _{θJA} | Thermal Resistance, Junction-to-Ambient | 110 | °C/W |

Electrical Characteristics (T_J=25°C, unless otherwise noted)

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|------------------|---------------------------------------|--|-----|------|------|------|
| V(BR)DSS | Drain-Source Breakdown Voltage | V _{GS} = 0V, I _D = 250μA | 500 | 550 | -- | V |
| IDSS | Zero Gate Voltage Drain Current | V _{DS} = 500V, V _{GS} = 0V, T _J =25°C | -- | -- | 1 | μA |
| IGSS | Gate-Source Leakage | V _{GS} = ±30V | -- | -- | ±100 | nA |
| VGS(th) | Gate-Source Threshold Voltage | V _{DS} = V _{GS} , I _D = 250μA | 2.0 | 3.0 | 4.0 | V |
| RDS(on) | Drain-Source On-Resistance (Note3) | V _{GS} = 10V, I _D = 1.5A | -- | 2.8 | 3.5 | Ω |
| C _{iss} | Input Capacitance | V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz | -- | 250 | -- | pF |
| C _{oss} | Output Capacitance | | -- | 45 | -- | |
| C _{rss} | Reverse Transfer Capacitance | | -- | 5 | -- | |
| Q _g | Total Gate Charge | V _{DD} =480V, I _D = 1A, V _{GS} = 10V | -- | 6.5 | -- | nC |
| Q _{gs} | Gate-Source Charge | | -- | 1.6 | -- | |
| Q _{gd} | Gate-Drain Charge | | -- | 2.4 | -- | |
| td(on) | Turn-on Delay Time | V _{DD} =250V, I _D = 3A, R _G = 25Ω | -- | 7.8 | -- | ns |
| t _r | Turn-on Rise Time | | -- | 33 | -- | |
| td(off) | Turn-off Delay Time | | -- | 13 | -- | |
| t _f | Turn-off Fall Time | | -- | 59 | -- | |
| IS | Continuous Body Diode Current | T _C = 25 °C | -- | -- | 3 | A |
| ISM | Pulsed Diode Forward Current | | -- | -- | 12 | A |
| V _{SD} | Body Diode Voltage | T _J = 25°C, I _{SD} = 3A, V _{GS} = 0V | -- | -- | 1.4 | V |
| trr | Reverse Recovery Time | V _{GS} = 0V, I _S = 3A, di _F /dt = 100A / μs | -- | 190 | -- | ns |
| Q _{rr} | Reverse Recovery Charge | | -- | 0.53 | -- | μC |

Note :

- 1、 The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、 The EAS data shows Max. rating . IAS = 2.4A, VDD = 50V, RG = 25 Ω, Starting T_J = 25 °C
- 3、 The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

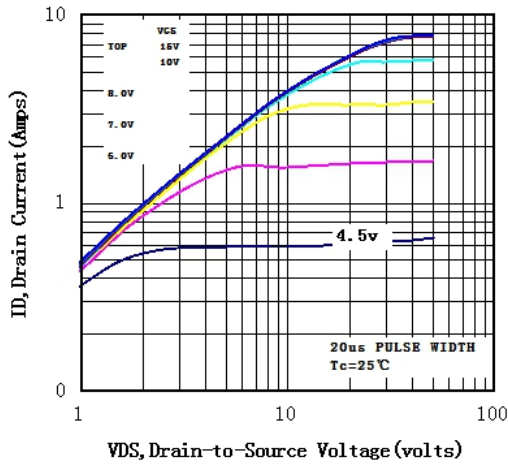


Fig1 Typical Output Characteristics, $T_c=25^\circ\text{C}$

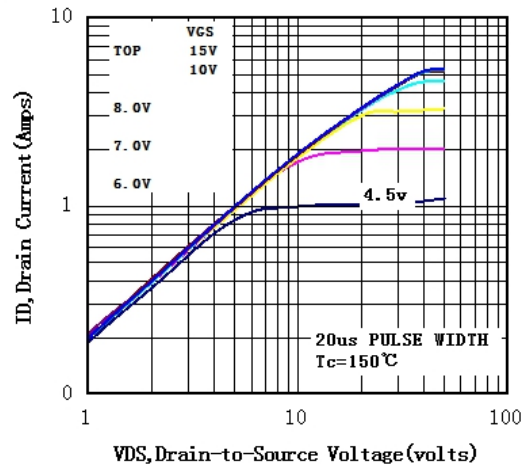


Fig2 Typical Output Characteristics, $T_c=150^\circ\text{C}$

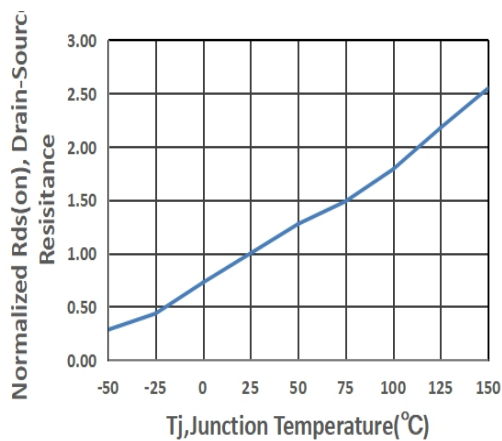


Fig3 Normalized On-Resistance Vs. Temperature

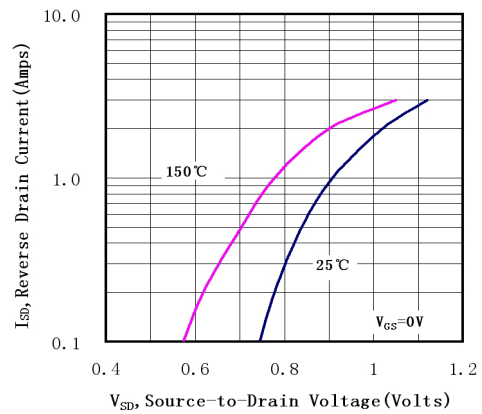


Fig4 Typical Source-Drain Diode Forward Voltage

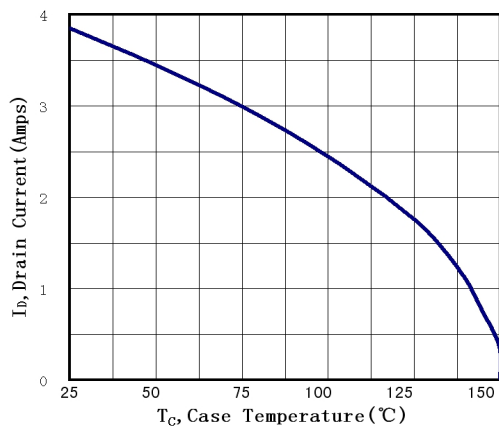


Fig5 Maximum Drain Current Vs. Case Temperature

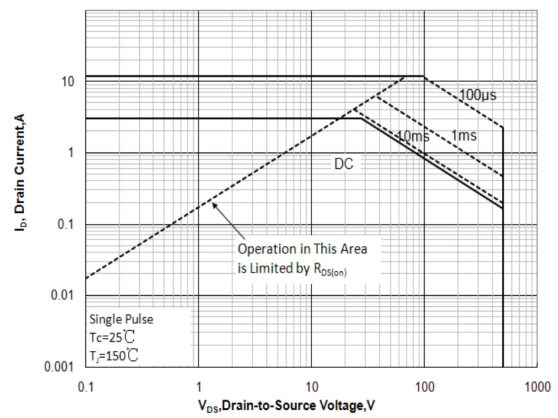
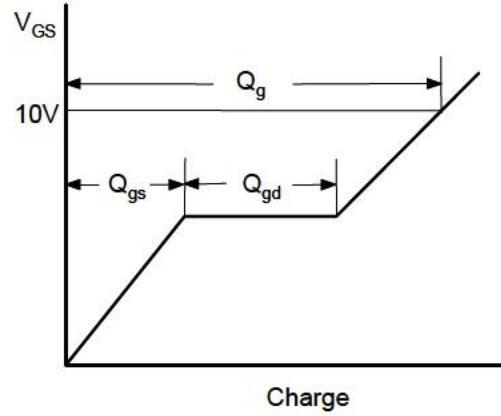
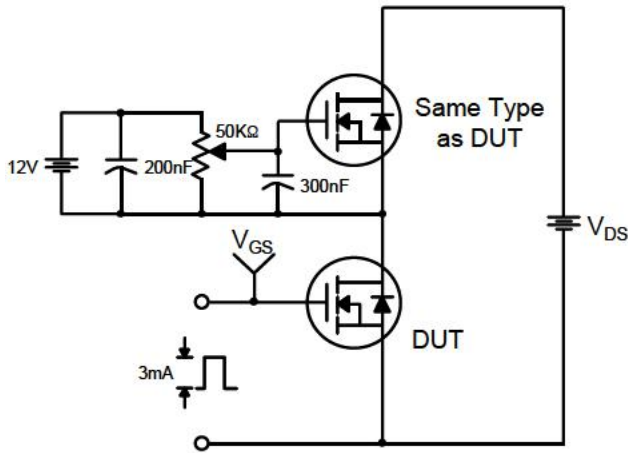
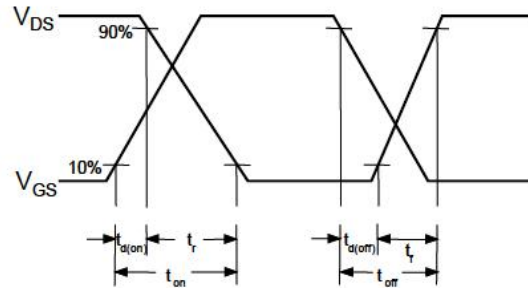
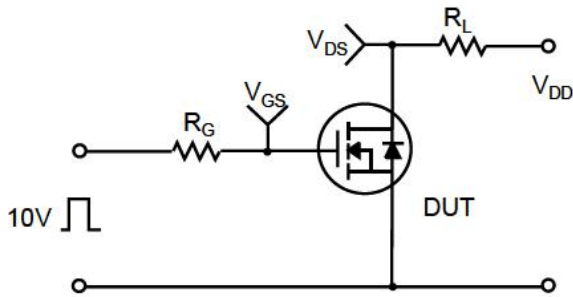


Fig6 Maximum Safe Operating Area

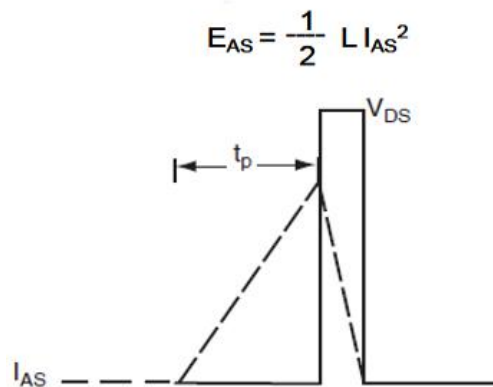
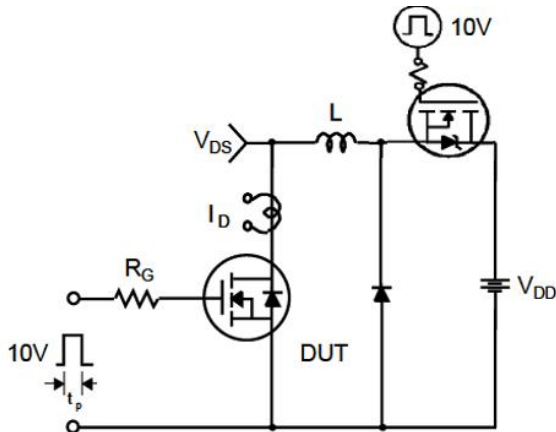
Gate Charge Test Circuit & Waveform



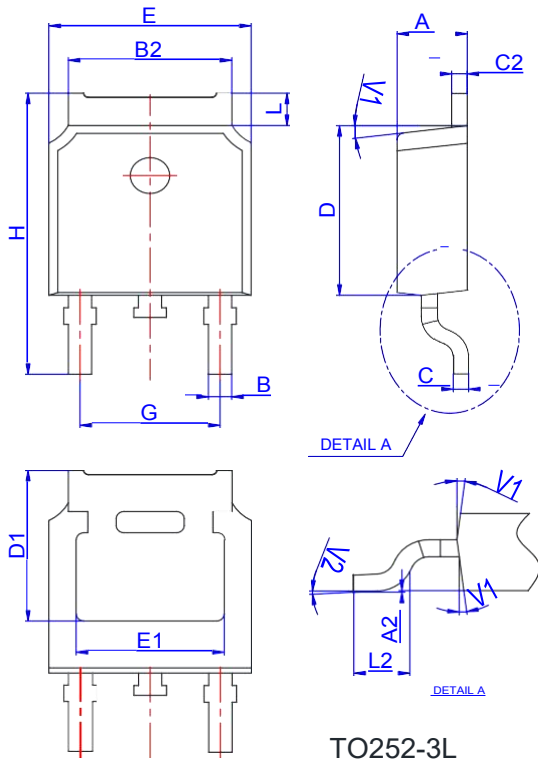
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

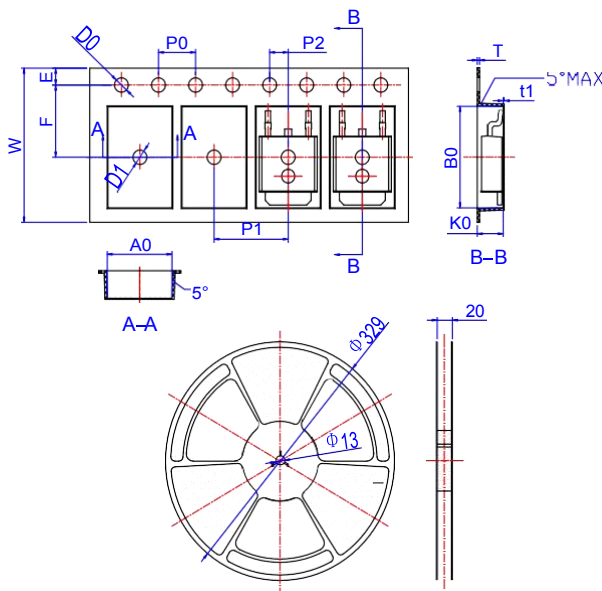


Package Mechanical Data-TO252-3L



| Ref. | Dimensions | | | | | |
|------|-------------|------|-------|----------|------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.10 | | 2.50 | 0.083 | | 0.098 |
| A2 | 0 | | 0.10 | 0 | | 0.004 |
| B | 0.66 | | 0.86 | 0.026 | | 0.034 |
| B2 | 5.18 | | 5.48 | 0.202 | | 0.216 |
| C | 0.40 | | 0.60 | 0.016 | | 0.024 |
| C2 | 0.44 | | 0.58 | 0.017 | | 0.023 |
| D | 5.90 | | 6.30 | 0.232 | | 0.248 |
| D1 | 5.30REF | | | 0.209REF | | |
| E | 6.40 | | 6.80 | 0.252 | | 0.268 |
| E1 | 4.63 | | | 0.182 | | |
| G | 4.47 | | 4.67 | 0.176 | | 0.184 |
| H | 9.50 | | 10.70 | 0.374 | | 0.421 |
| L | 1.09 | | 1.21 | 0.043 | | 0.048 |
| L2 | 1.35 | | 1.65 | 0.053 | | 0.065 |
| V1 | | 7° | | | 7° | |
| V2 | 0° | | 6° | 0° | | 6° |

Reel Specification-TO252-3L



| Ref. | Dimensions | | | | | |
|------|-------------|-------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| W | 15.90 | 16.00 | 16.10 | 0.626 | 0.630 | 0.634 |
| E | 1.65 | 1.75 | 1.85 | 0.065 | 0.069 | 0.073 |
| F | 7.40 | 7.50 | 7.60 | 0.291 | 0.295 | 0.299 |
| D0 | 1.40 | 1.50 | 1.60 | 0.055 | 0.059 | 0.063 |
| D1 | 1.40 | 1.50 | 1.60 | 0.055 | 0.059 | 0.063 |
| P0 | 3.90 | 4.00 | 4.10 | 0.154 | 0.157 | 0.161 |
| P1 | 7.90 | 8.00 | 8.10 | 0.311 | 0.315 | 0.319 |
| P2 | 1.90 | 2.00 | 2.10 | 0.075 | 0.079 | 0.083 |
| A0 | 6.85 | 6.90 | 7.00 | 0.270 | 0.271 | 0.276 |
| B0 | 10.45 | 10.50 | 10.60 | 0.411 | 0.413 | 0.417 |
| K0 | 2.68 | 2.78 | 2.88 | 0.105 | 0.109 | 0.113 |
| T | 0.24 | | 0.27 | 0.009 | | 0.011 |
| t1 | 0.10 | | | 0.004 | | |
| 10P0 | 39.80 | 40.00 | 40.20 | 1.567 | 1.575 | 1.583 |