

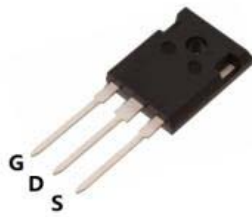
Type: YZPST-65R72GF

N-channel Power MOSFET

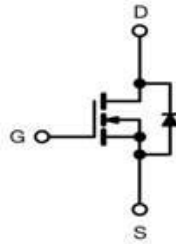
| PRODUCT SUMMARY | |
|--------------------------------|-------------------|
| V_{DS} (V) at T_J max. | 700 |
| $R_{DS(on)}$ max. at 25°C (mΩ) | $V_{GS}=10V$ 72 |
| Q_g max. (nC) | 130 |
| Q_{gs} (nC) | 30 |
| Q_{gd} (nC) | 34 |
| Configuration | single |

Features

- Fast Body Diode MOSFET
- $I_D=47A(V_{GS}=10V)$
- Ultra Low Gate Charge
- Improved dv/dt Capability
- RoHS compliant



TO-247



Schematic diagram

Applications

- Switching Mode Power Supplies (SMPS)
- Server and Telecom Power Supplies
- Welding & Battery Chargers
- Solar (PV Inverters)
- AC/DC Bridge Circuits

| ORDERING INFORMATION | |
|----------------------|---------------|
| Device | YZPST-65R72GF |
| Device Package | TO-247 |
| Marking | 65R72GF |

| ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ C$, unless otherwise noted) | | | |
|---|----------------|--------------------|------|
| Parameter | Symbol | Limit | Unit |
| Drain to Source Voltage | V_{DSS} | 650 | V |
| Continuous Drain Current (@ $T_C=25^\circ C$) | I_D | 47 ⁽¹⁾ | A |
| Continuous Drain Current (@ $T_C=100^\circ C$) | | 29 ⁽¹⁾ | A |
| Drain current pulsed ⁽²⁾ | I_{DM} | 138 ⁽¹⁾ | A |
| Gate to Source Voltage | V_{GS} | ± 30 | V |
| Single pulsed Avalanche Energy ⁽³⁾ | E_{AS} | 1500 | mJ |
| MOSFET dv/dt ruggedness (@ $V_{DS}=0\sim 400V$) | dv/dt | 25 | V/ns |
| Peak diode Recovery dv/dt ⁽⁴⁾ | dv/dt | 15 | V/ns |
| Total power dissipation (@ $T_C=25^\circ C$) | P_D | 417 | W |
| Derating Factor above 25°C | | 3.34 | W/°C |
| Operating Junction Temperature & Storage Temperature | T_{STG}, T_J | -55 to + 150 | °C |
| Maximum lead temperature for soldering purpose | T_L | 260 | °C |

Notes

1. Drain current is limited by maximum junction temperature.
2. Repetitive rating : pulse width limited by junction temperature.
3. $L = 37mH, I_{AS} = 9A, V_{DD} = 50V, R_G=25\Omega$, Starting at $T_J = 25^\circ C$
4. $I_{SD} \leq I_D, di/dt = 100A/us, V_{DD} \leq BV_{DSS}$, Starting at $T_J = 25^\circ C$

| THERMAL CHARACTERISTICS | | | |
|---|------------|-------|-----------------------------|
| Parameter | Symbol | Value | Unit |
| Thermal resistance, Junction to case | R_{thjc} | 0.33 | $^{\circ}\text{C}/\text{W}$ |
| Thermal resistance, Junction to ambient | R_{thja} | 40 | $^{\circ}\text{C}/\text{W}$ |

| ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}\text{C}$ unless otherwise specified) | | | | | | |
|--|--------------------------------|---|--|------|------|-----------------------------|
| Parameter | Symbol | Test conditions | Min. | Typ. | Max. | Unit |
| Off Characteristics | | | | | | |
| Drain to source breakdown voltage | BV_{DSS} | $V_{GS}=0\text{V}, I_D=250\mu\text{A}$ | 650 | -- | -- | V |
| Breakdown voltage temperature coefficient | $\Delta BV_{DSS} / \Delta T_J$ | $I_D=250\mu\text{A}$, referenced to 25°C | -- | 0.7 | -- | $\text{V}/^{\circ}\text{C}$ |
| Drain to source leakage current | I_{DSS} | $V_{DS}=650\text{V}, V_{GS}=0\text{V}$ | -- | -- | 10 | μA |
| | | $V_{DS}=520\text{V}, T_C=125^{\circ}\text{C}$ | -- | 75 | 500 | μA |
| Gate to source leakage current, forward | I_{GSS} | $V_{GS}=30\text{V}, V_{DS}=0\text{V}$ | -- | -- | 150 | nA |
| Gate to source leakage current, reverse | | $V_{GS}=-30\text{V}, V_{DS}=0\text{V}$ | -- | -- | -150 | nA |
| On Characteristics | | | | | | |
| Gate threshold voltage | $V_{GS(TH)}$ | $V_{DS}=V_{GS}, I_D=250\mu\text{A}$ | 2.5 | -- | 4.5 | V |
| Drain to source on state resistance | $R_{DS(ON)}$ | $V_{GS}=10\text{V}, I_D=24\text{A}$ | -- | 60 | 72 | $\text{m}\Omega$ |
| Forward Transconductance | G_{fs} | $V_{DS}=30\text{V}, I_D=24\text{A}$ | -- | 32 | -- | S |
| Dynamic Characteristics | | | | | | |
| Input capacitance | C_{iss} | $V_{GS}=0\text{V}, V_{DS}=200\text{V}, f=1\text{MHz}$ | -- | 4655 | -- | pF |
| Output capacitance | C_{oss} | | -- | 185 | -- | |
| Reverse transfer capacitance | C_{rss} | | -- | 5.1 | -- | |
| Turn on delay time | $t_{d(on)}$ | | $V_{DS}=380\text{V}, I_D=24\text{A}, R_G=25\Omega$ | -- | 34 | -- |
| Rising time | t_r | -- | | 31 | -- | |
| Turn off delay time | $t_{d(off)}$ | -- | | 80 | -- | |
| Fall time | t_f | -- | | 26 | -- | |
| Total gate charge | Q_g | $V_{DS}=520\text{V}, V_{GS}=10\text{V}, I_D=24\text{A}$ | -- | 104 | 130 | nC |
| Gate-source charge | Q_{gs} | | -- | 30 | -- | |
| Gate-drain charge | Q_{gd} | | -- | 34 | -- | |

| SOURCE TO DRAIN DIODE RATINGS CHARACTERISTICS | | | | | | |
|---|----------|---|------|------|------|---------------|
| Parameter | Symbol | Test conditions | Min. | Typ. | Max. | Unit |
| Continuous source current | I_S | Integral reverse p-n Junction diode in the MOSFET | -- | -- | 47 | A |
| Pulsed source current | I_{SM} | | -- | -- | 138 | A |
| Diode forward voltage drop. | V_{SD} | $I_S=24\text{A}, V_{GS}=0\text{V}$ | -- | 0.9 | 1.2 | V |
| Reverse recovery time | T_{rr} | $I_S=24\text{A}, V_{GS}=0\text{V}, di_f/dt=100\text{A}/\mu\text{s}$ | -- | 230 | 320 | ns |
| Reverse recovery Charge | Q_{rr} | | -- | 2.7 | 5.0 | μC |

Fig1. Output characteristics

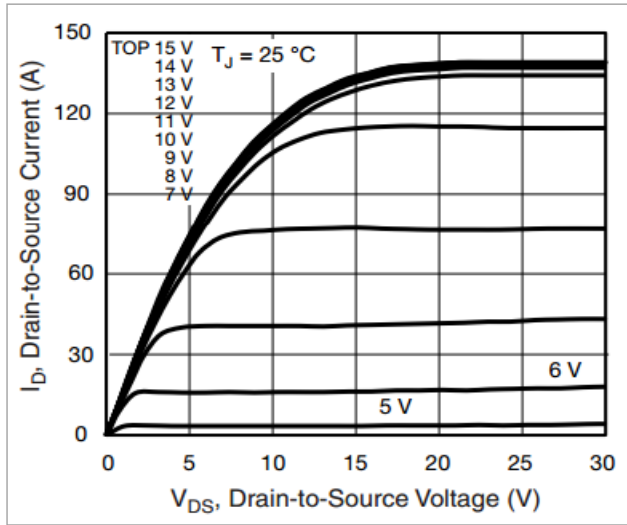


Fig2. - Maximum Drain Current vs. Case Temperature

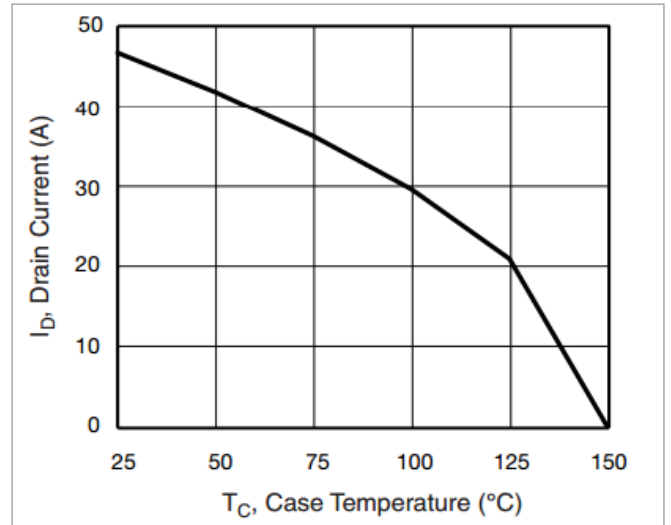


Fig3. Gate charge characteristics

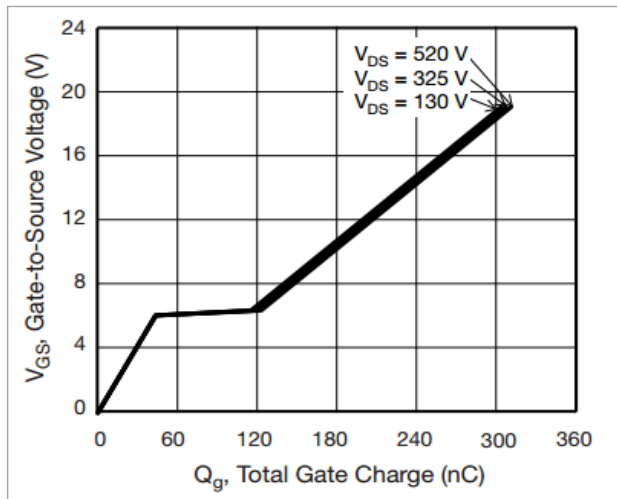


Fig 4. Capacitance Characteristics

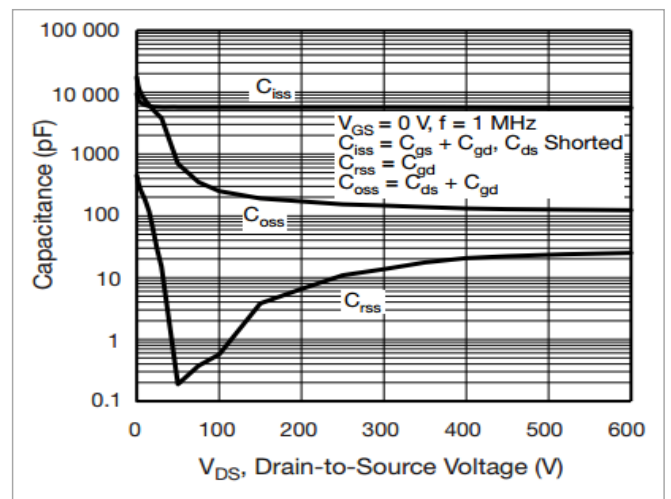


Fig 5. $R_{DS(ON)}$ vs junction temperature

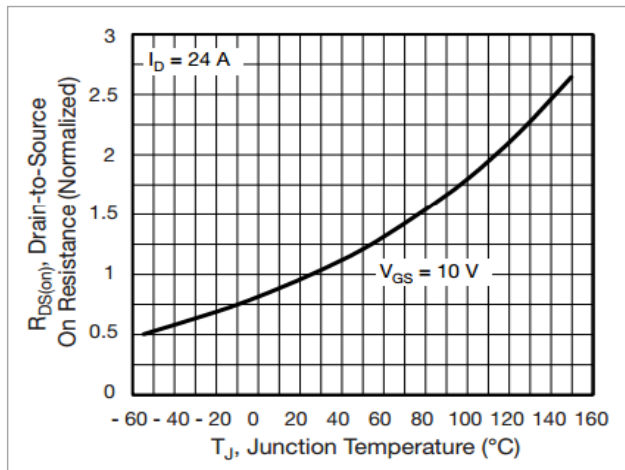


Fig 6. - Temperature vs. Drain-to-Source Voltage

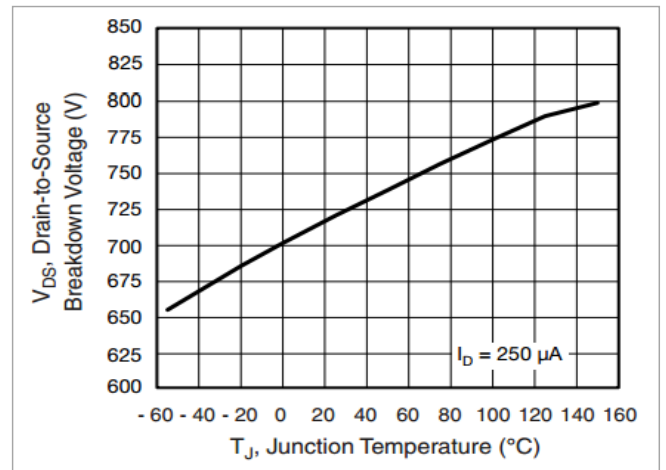


Fig 7 . Safe operating area

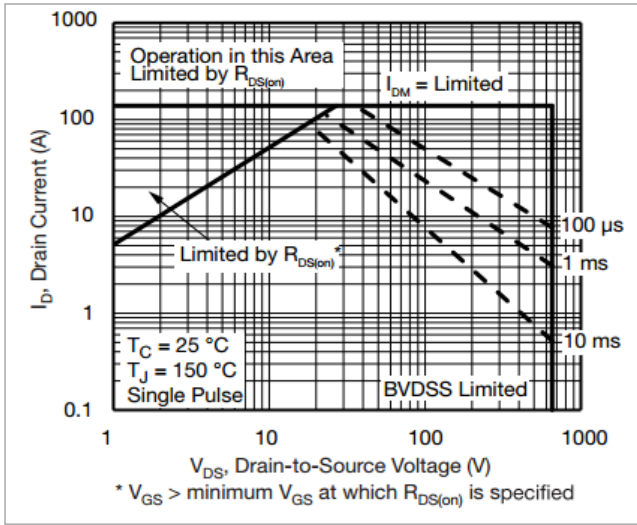


Fig 8. Forward characteristics of reverse diode

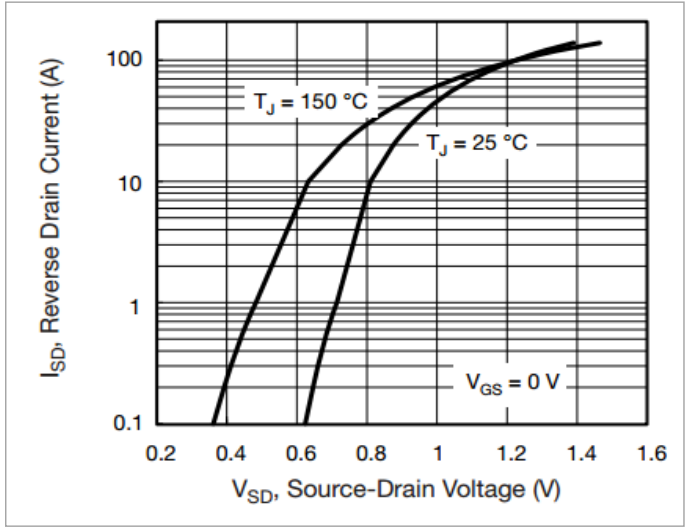


Fig 9 . Transient thermal impedance

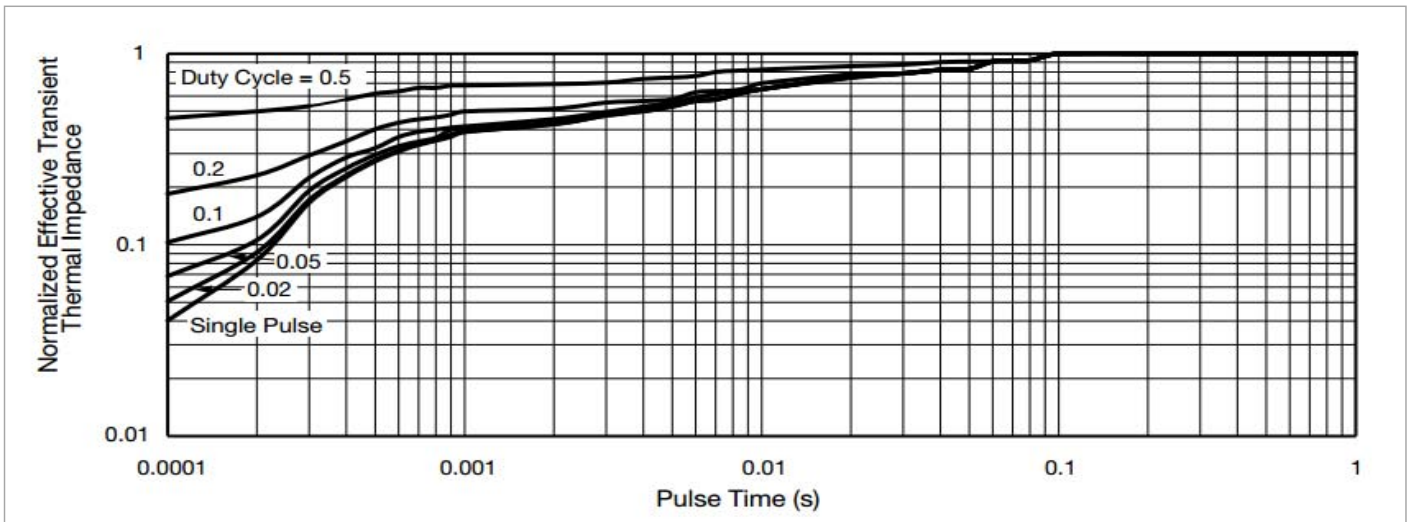


Fig 10. Gate charge test circuit & waveform

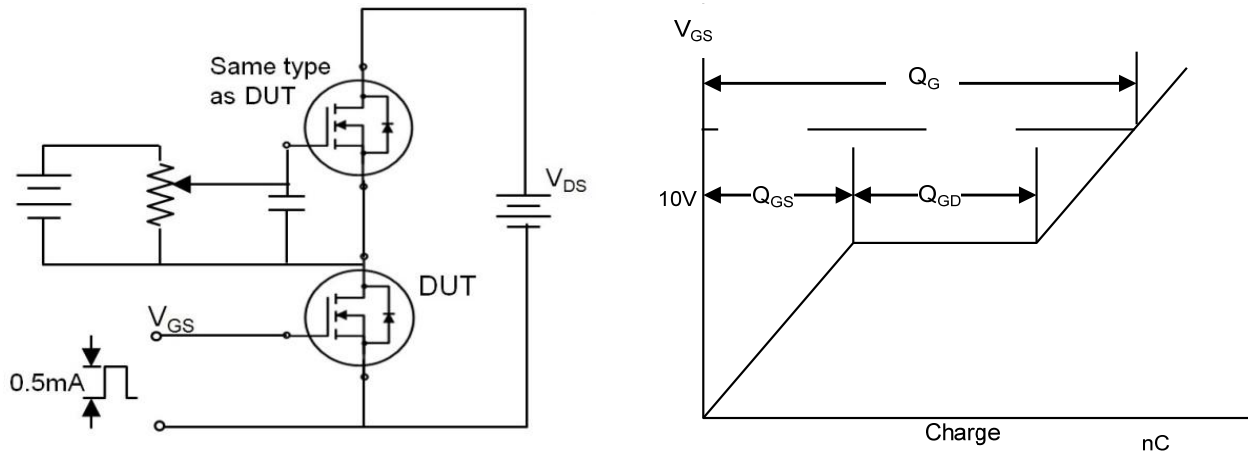


Fig 11. Switching time test circuit & waveform

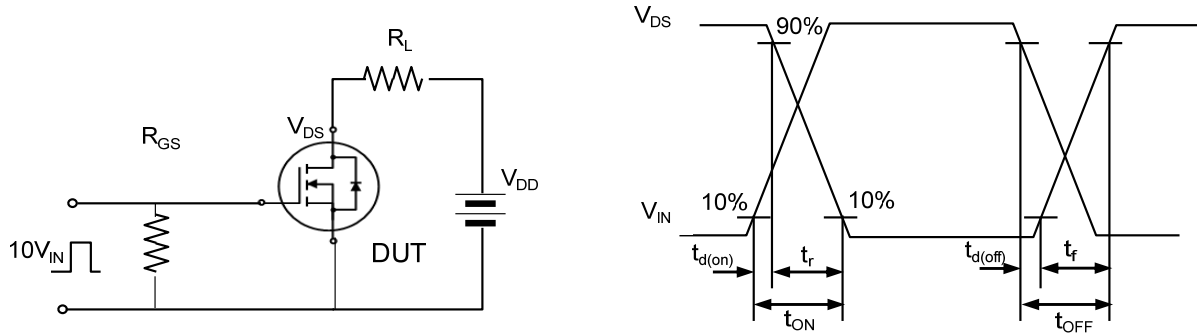


Fig 12. Unclamped Inductive switching test circuit & waveform

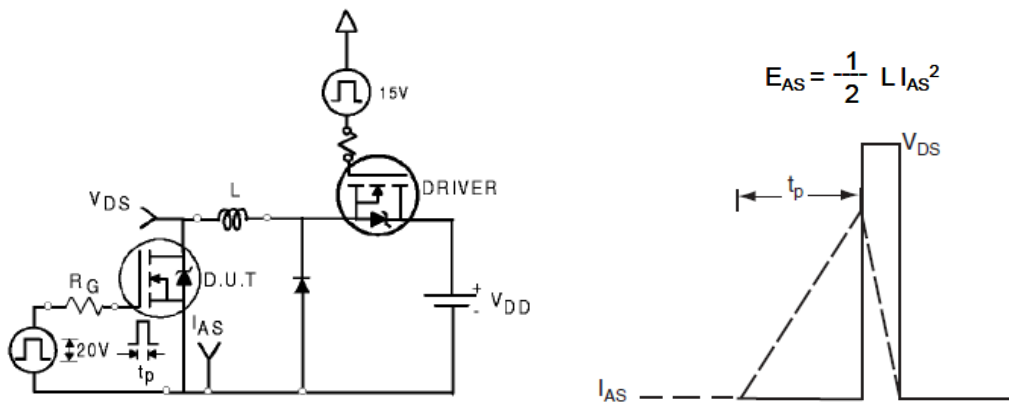


Fig 13. Peak diode recovery dv/dt test circuit & waveform

