

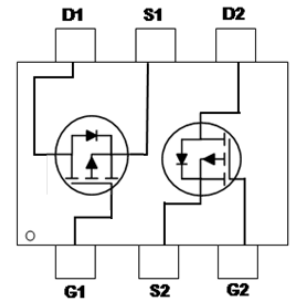
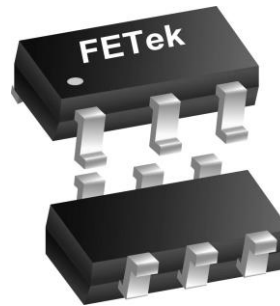
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent Cdv/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary


| BVDSS | RDSON | ID |
|-------|-------|-------|
| -20V | 100mΩ | -3.0A |

Description

The FKQ4953 is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the small power switching and load switch applications. The FKQ4953 meet the RoHS and Green Product requirement with full function reliability approved.

TSOP6 Pin Configuration

Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|----------------------|--|------------|------------|
| V_{DS} | Drain-Source Voltage | -20 | V |
| V_{GS} | Gate-Source Voltage | ± 12 | V |
| $I_D@T_A=25^\circ C$ | Continuous Drain Current, $V_{GS} @ -4.5V^1$ | -3 | A |
| $I_D@T_A=70^\circ C$ | Continuous Drain Current, $V_{GS} @ -4.5V^1$ | -2 | A |
| I_{DM} | Pulsed Drain Current ² | -10 | A |
| $P_D@T_A=25^\circ C$ | Total Power Dissipation ³ | 1.25 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|-----------------|---|------|------|--------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient ¹ | --- | 100 | $^\circ C/W$ |
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient ¹ , $t \leq 10s$ | --- | 70 | $^\circ C/W$ |

**Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, unless otherwise noted)**

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|--------------|--|---|------|------|-----------|------------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=-250\mu A$ | -20 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance ² | $V_{GS}=-4.5V, I_D=-3A$ | --- | 85 | 100 | m Ω |
| | | $V_{GS}=-2.5V, I_D=-2A$ | --- | 120 | 140 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}=V_{DS}, I_D=-250\mu A$ | -0.4 | -0.6 | -1.2 | V |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=-16V, V_{GS}=0V, T_J=25^\circ C$ | --- | --- | -1 | μA |
| | | $V_{DS}=-16V, V_{GS}=0V, T_J=55^\circ C$ | --- | --- | -5 | |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 12V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| g_{fs} | Forward Transconductance | $V_{DS}=-5V, I_D=-3A$ | --- | 12.2 | --- | S |
| Q_g | Total Gate Charge (-4.5V) | $V_{DS}=-15V, V_{GS}=-4.5V, I_D=-3A$ | --- | 10.1 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 1.21 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 2.46 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}=-10V, V_{GS}=-4.5V, R_G=3.3\Omega, I_D=-3A$ | --- | 5.6 | --- | ns |
| T_r | Rise Time | | --- | 32.2 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 45.6 | --- | |
| T_f | Fall Time | | --- | 29.2 | --- | |
| C_{iss} | Input Capacitance | $V_{DS}=-15V, V_{GS}=0V, f=1MHz$ | --- | 677 | --- | μF |
| C_{oss} | Output Capacitance | | --- | 82 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 73 | --- | |

Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------|--|--------------------------------------|------|------|------|------|
| I_S | Continuous Source Current ^{1,4} | $V_G=V_D=0V$, Force Current | --- | --- | -2 | A |
| V_{SD} | Diode Forward Voltage ² | $V_{GS}=0V, I_S=-1A, T_J=25^\circ C$ | --- | --- | -1 | V |

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150 $^\circ C$ junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

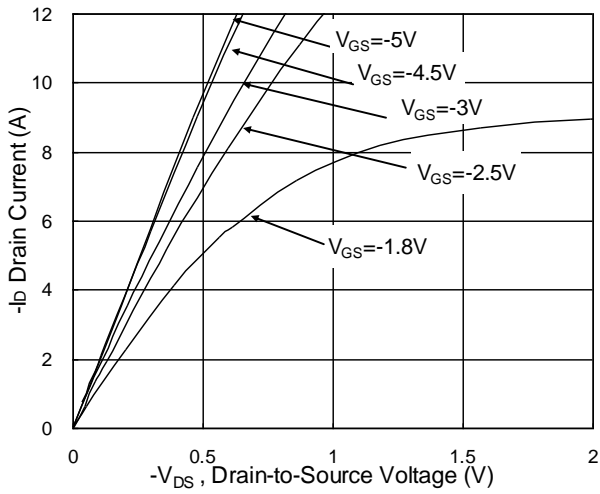


Fig.1 Typical Output Characteristics

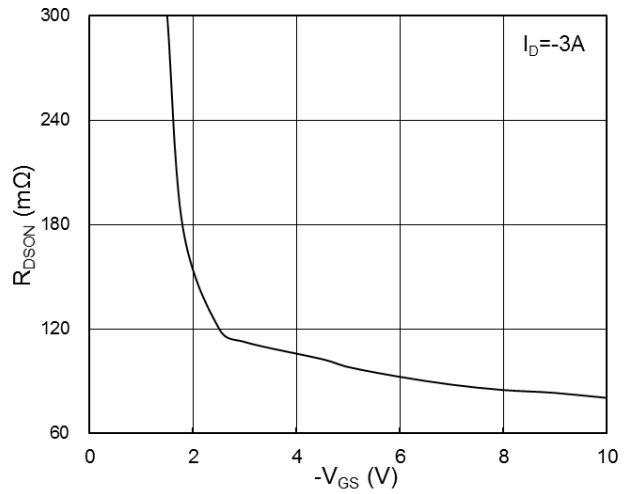


Fig.2 On-Resistance vs G-S Voltage

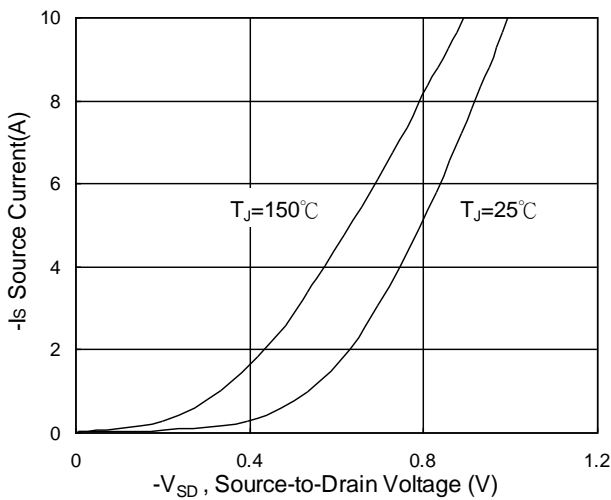


Fig.3 Source Drain Forward Characteristics

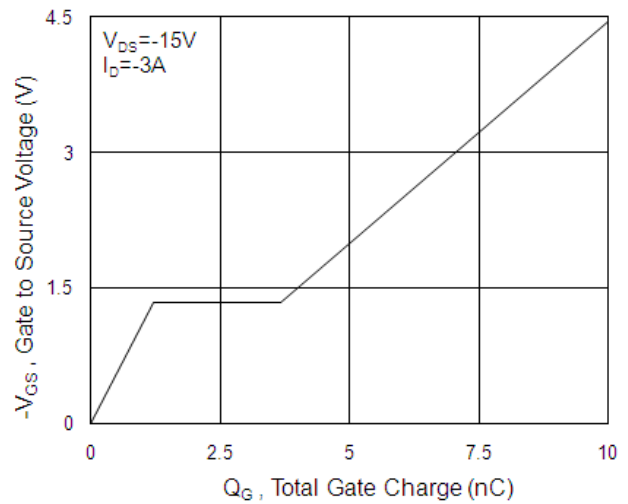


Fig.4 Gate-Charge Characteristics

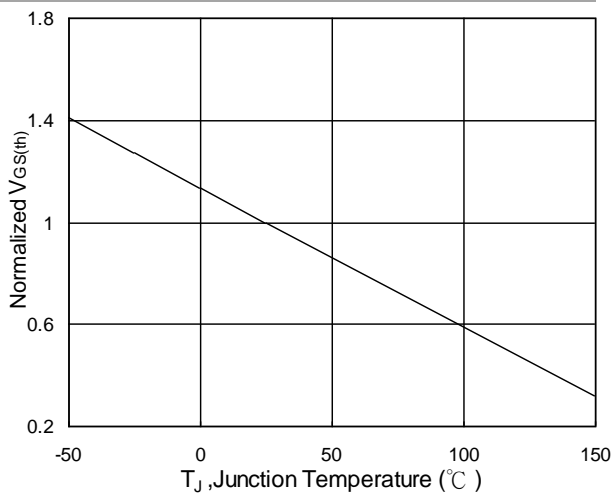


Fig.5 Normalized $V_{GS(th)}$ vs T_J

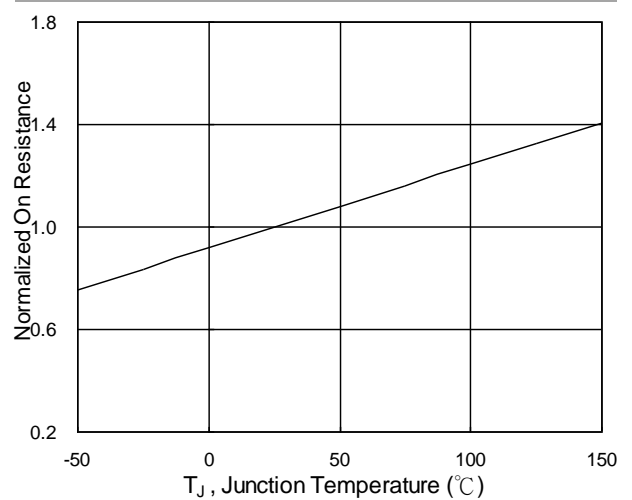


Fig.6 Normalized $R_{DS(on)}$ vs T_J

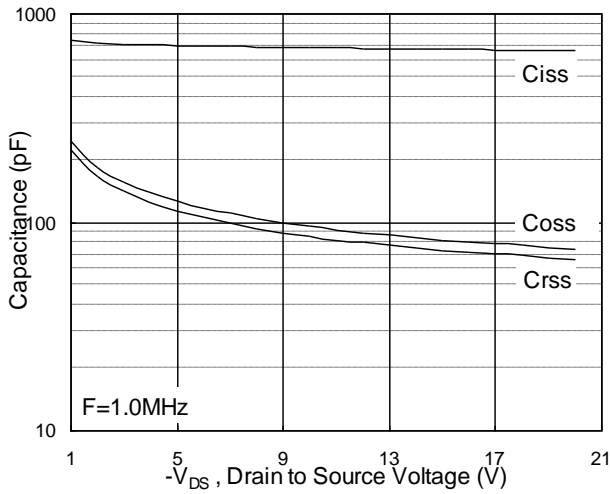


Fig.7 Capacitance

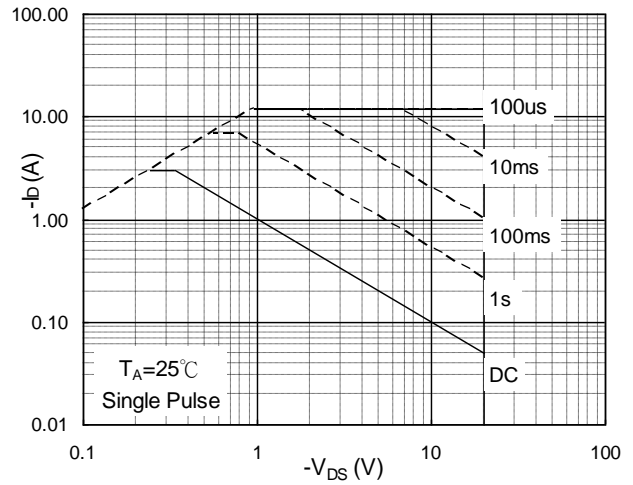


Fig.8 Safe Operating Area

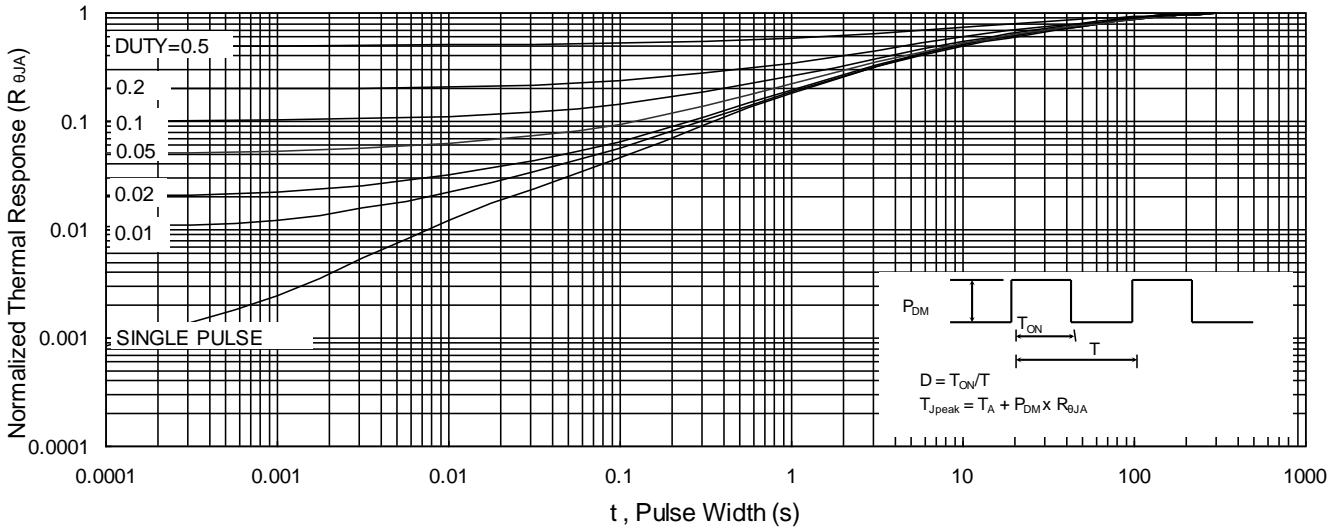


Fig.9 Normalized Maximum Transient Thermal Impedance

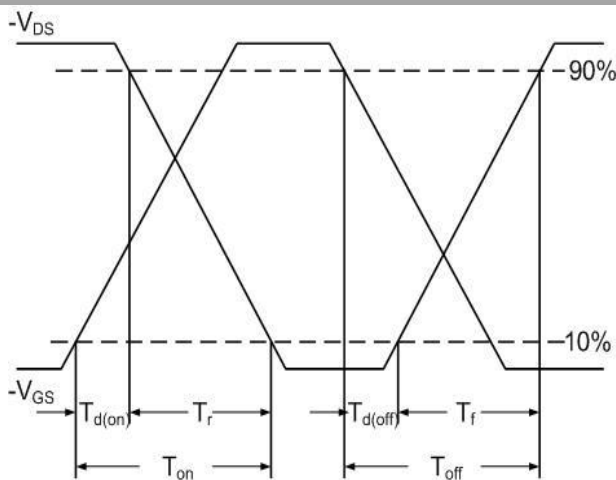


Fig.10 Switching Time Waveform

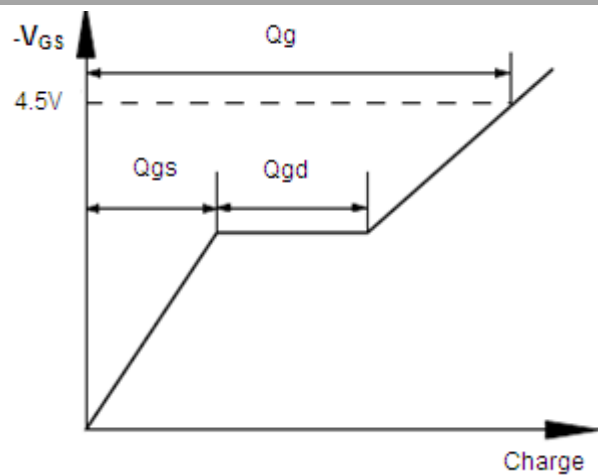
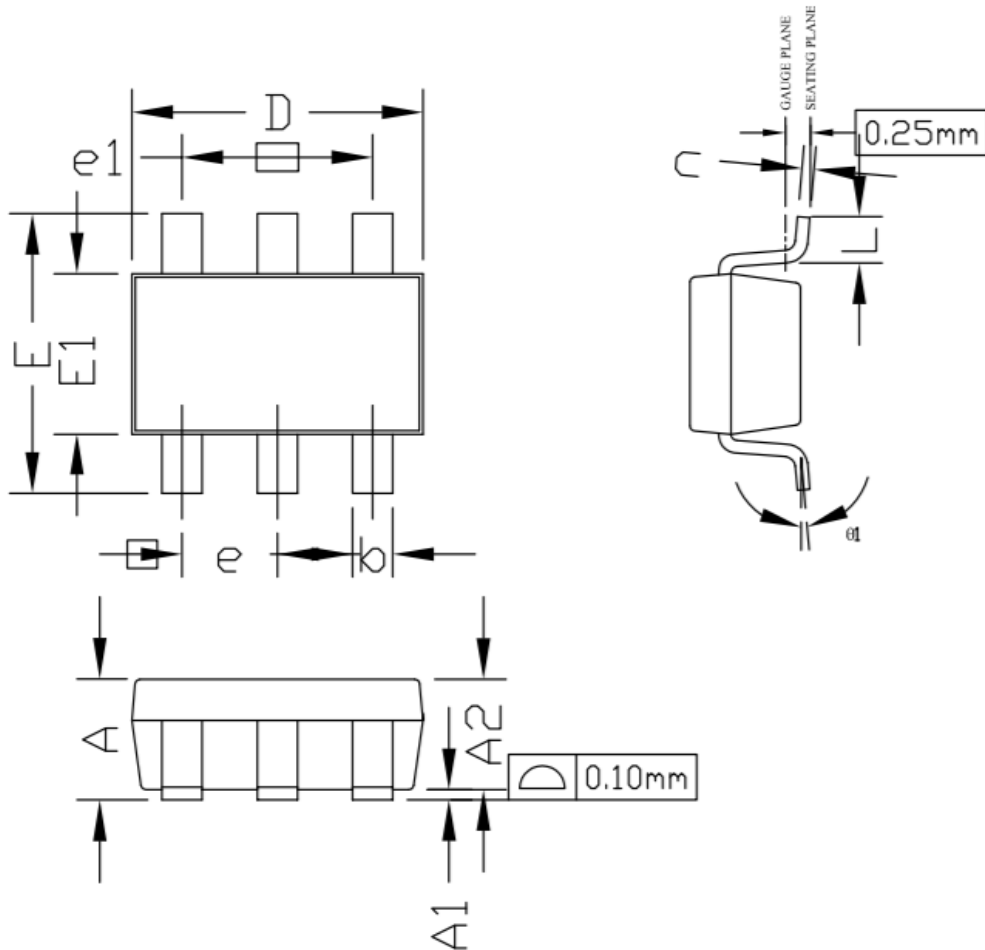
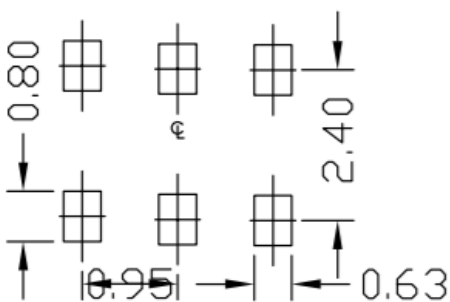


Fig.11 Gate Charge Waveform

TSOP6 Package Outline Dimensions



RECOMMENDED LAND PATTERN



UNIT: mm

| SYMBOLS | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHES | | |
|------------|---------------------------|------|------|----------------------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.80 | — | 1.25 | 0.031 | — | 0.049 |
| A1 | 0.00 | — | 0.15 | 0.000 | — | 0.006 |
| A2 | 0.70 | 1.10 | 1.20 | 0.028 | 0.043 | 0.047 |
| b | 0.30 | 0.40 | 0.50 | 0.012 | 0.016 | 0.020 |
| c | 0.08 | 0.13 | 0.20 | 0.003 | 0.005 | 0.008 |
| D | 2.70 | 2.90 | 3.10 | 0.106 | 0.114 | 0.122 |
| E | 2.50 | 2.80 | 3.10 | 0.098 | 0.110 | 0.122 |
| E1 | 1.50 | 1.60 | 1.70 | 0.059 | 0.063 | 0.067 |
| e | 0.95 BSC. | | | 0.037BSC. | | |
| e1 | 1.90 BSC. | | | 0.075 BSC. | | |
| L | 0.30 | — | 0.60 | 0.012 | — | 0.024 |
| $\theta 1$ | 0° | — | 8° | 0° | — | 8° |