

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Description

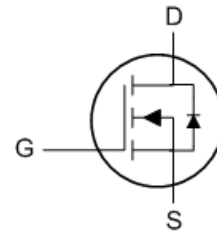
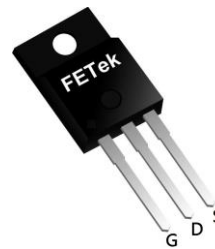
The FKF0024A is the high cell density trenched N-ch MOSFETs, which provide excellent R_{DS(on)} and gate charge for most of the synchronous buck converter applications.

The FKF0024A meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary

| BVDSS | R _{DS(on)} | I _D |
|-------|---------------------|----------------|
| 100V | 12mΩ | 43A |

TO220F Pin Configuration



Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---------------------------------------|--|------------|-------|
| V _{DS} | Drain-Source Voltage | 100 | V |
| V _{GS} | Gate-Source Voltage | ±20 | V |
| I _D @T _C =25°C | Continuous Drain Current, V _{GS} @ 10V ¹ | 43 | A |
| I _D @T _C =100°C | Continuous Drain Current, V _{GS} @ 10V ¹ | 31 | A |
| I _{DM} | Pulsed Drain Current ² | 250 | A |
| EAS | Single Pulse Avalanche Energy ³ | 180 | mJ |
| I _{AS} | Avalanche Current | 60 | A |
| P _D @T _C =25°C | Total Power Dissipation ⁴ | 40 | W |
| T _{STG} | Storage Temperature Range | -55 to 175 | °C |
| T _J | Operating Junction Temperature Range | -55 to 175 | °C |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|------------------|--|------|------|------|
| R _{θJA} | Thermal Resistance Junction-Ambient ¹ | --- | 62 | °C/W |
| R _{θJC} | Thermal Resistance Junction-Case ¹ | --- | 3.7 | °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 | $V_{GS}=0V, I_D=250\mu A$ | 100 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance ² | $V_{GS}=10V, I_D=15A$ | --- | 9 | 12 | m Ω |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}=V_{DS}, I_D=250\mu A$ | 2.5 | --- | 4.5 | V |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$ | --- | --- | 1 | uA |
| | | $V_{DS}=80V, V_{GS}=0V, T_J=55^\circ\text{C}$ | --- | --- | 5 | |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| g_{fs} | Forward Transconductance | $V_{DS}=5V, I_D=30A$ | --- | 50 | --- | S |
| R_g | Gate Resistance | $V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$ | --- | 1.2 | --- | Ω |
| Q_g | Total Gate Charge (10V) | $V_{DS}=80V, V_{GS}=10V, I_D=30A$ | --- | 84 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 28 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 26 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}=40V, V_{GS}=10V, R_G=3.3\Omega, I_D=30A$ | --- | 36 | --- | ns |
| T_r | Rise Time | | --- | 71 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 50 | --- | |
| T_f | Fall Time | | --- | 23 | --- | |
| C_{iss} | Input Capacitance | $V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$ | --- | 5580 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 571 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 278 | --- | |

Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------|--|---|------|------|------|------|
| I_S | Continuous Source Current ^{1,5} | $V_G=V_D=0V, \text{Force Current}$ | --- | --- | 43 | A |
| V_{SD} | Diode Forward Voltage ² | $V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$ | --- | --- | 1.2 | V |
| t_{rr} | Reverse Recovery Time | $I_F=30A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$ | --- | 24 | --- | nS |
| Q_{rr} | Reverse Recovery Charge | | --- | 28 | --- | nC |

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 EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=60A$
- 4.The power dissipation is limited by 150 $^\circ\text{C}$ junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

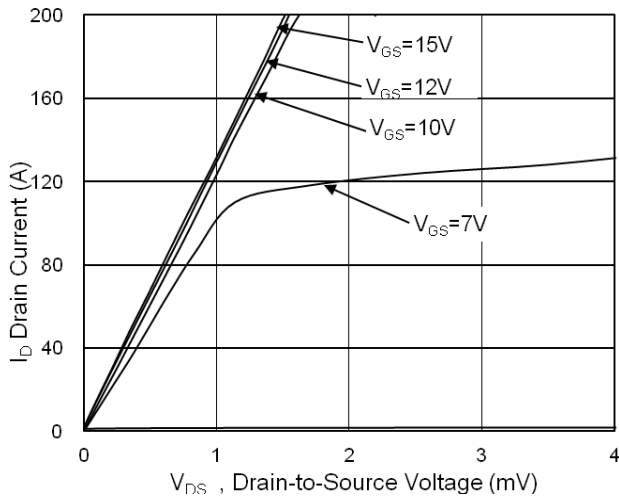


Fig.1 Typical Output Characteristics

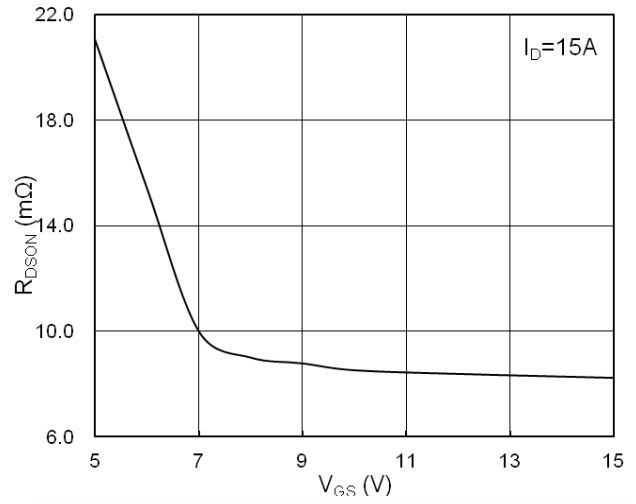


Fig.2 On-Resistance v.s Gate-Source

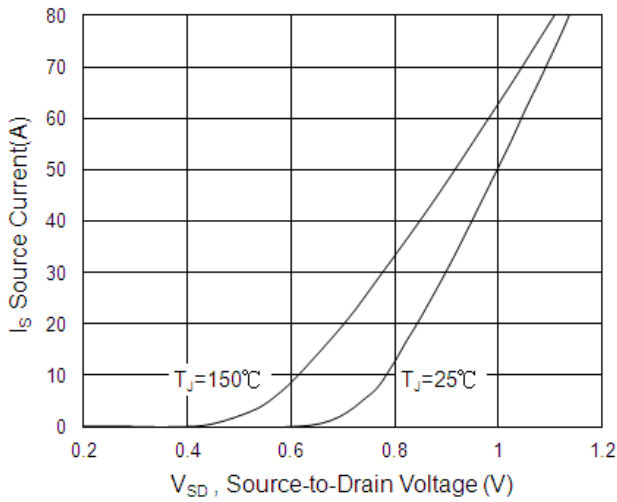


Fig.3 Forward Characteristics of Reverse

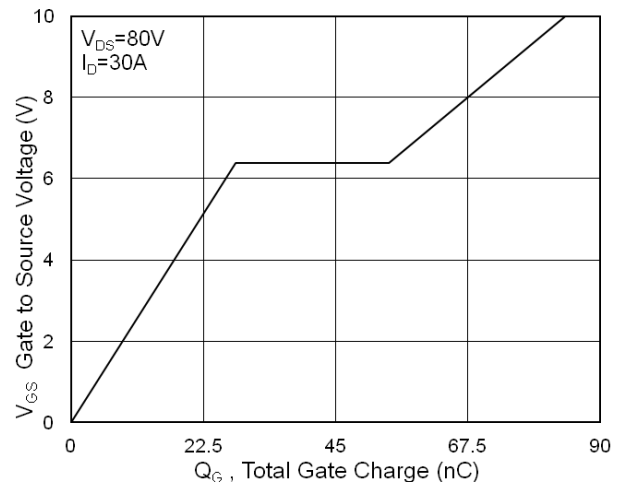


Fig.4 Gate-Charge Characteristics

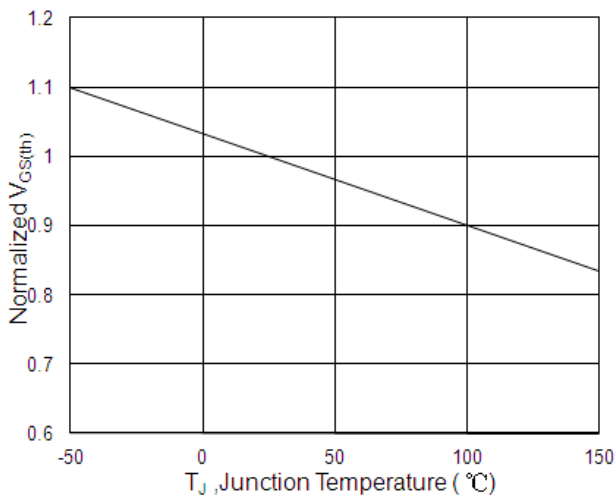


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

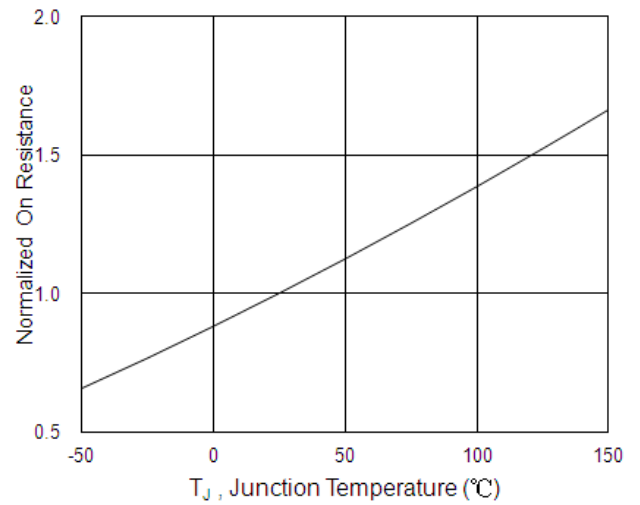


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

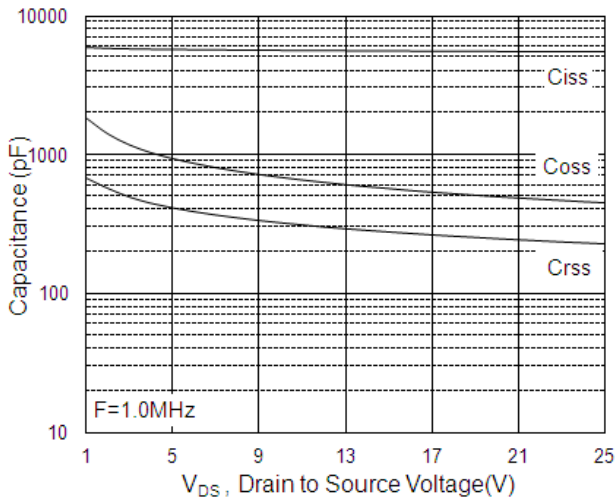


Fig.7 Capacitance

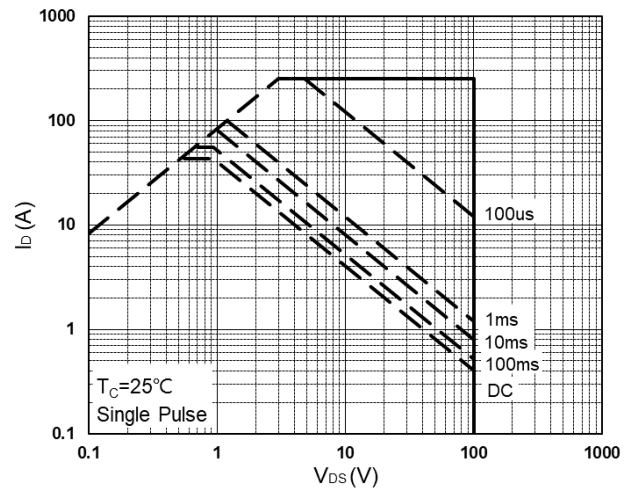


Fig.8 Safe Operating Area

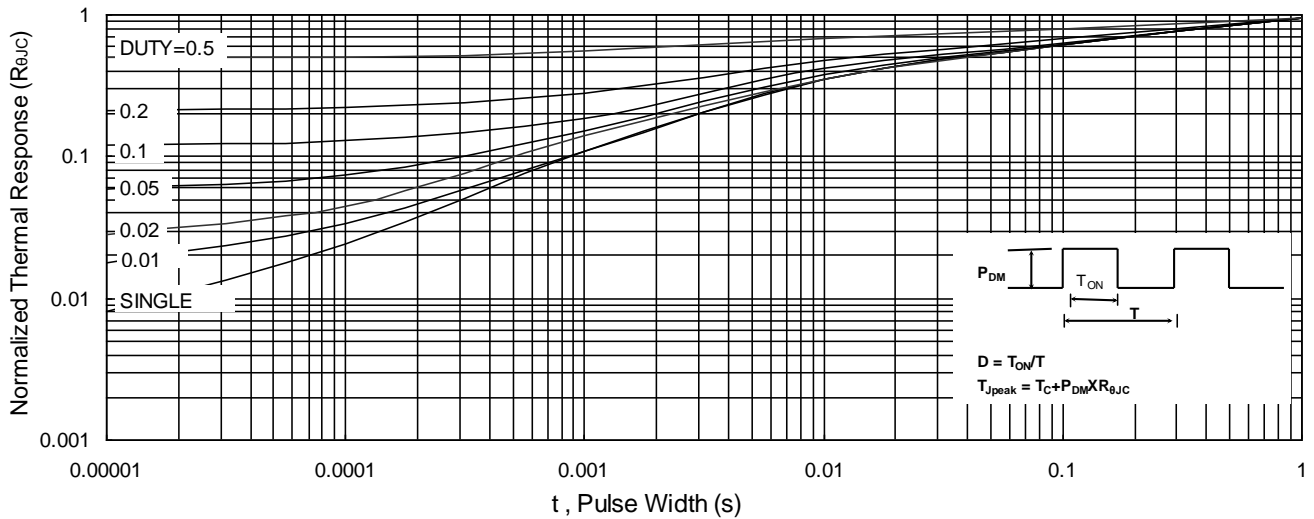


Fig.9 Normalized Maximum Transient Thermal Impedance

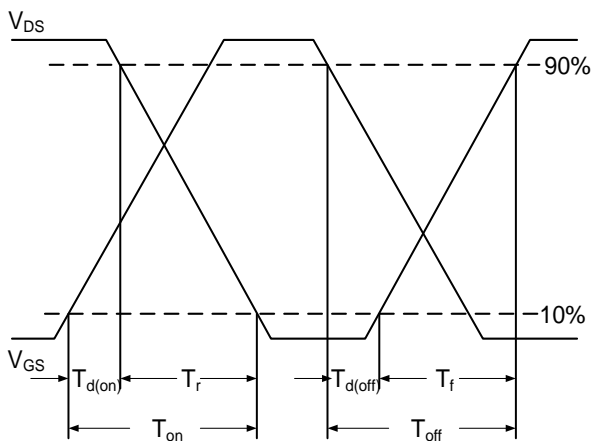


Fig.10 Switching Time Waveform

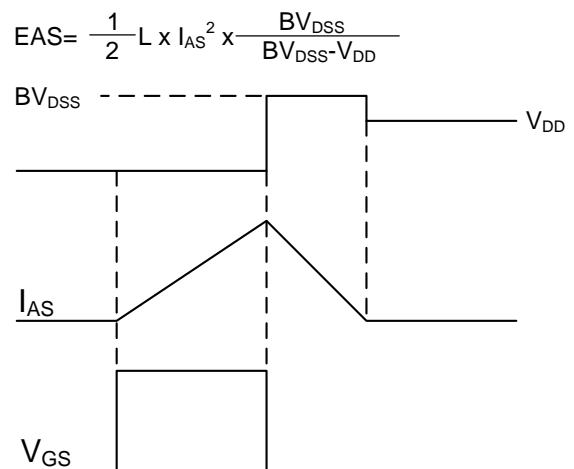


Fig.11 Unclamped Inductive Waveform