FETek Technology Corp.

## Dual N-Ch 30V Fast Switching MOSFETs

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

### Product Summary

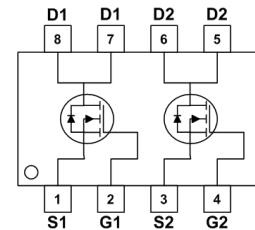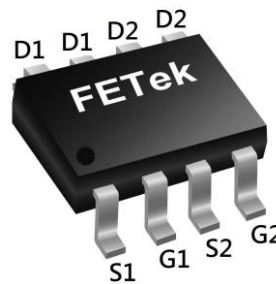| BVDSS | RDSON | ID |
|-------|-------|-----|
| 30V | 6mΩ | 13A |

### Description

The FKS3206 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The FKS3206 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

### Dual SOP8 Pin Configuration



### Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|--------|-----------|--------|-------|
| $V_{DS}$ | Drain-Source Voltage | 30 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_A$=25°C | Continuous Drain Current, $V_{GS}$ @ 10V[1] | 13 | A |
| $I_D$@$T_A$=70°C | Continuous Drain Current, $V_{GS}$ @ 10V[1] | 10 | A |
| $I_{DM}$ | Pulsed Drain Current[2] | 65 | A |
| EAS | Single Pulse Avalanche Energy[3] | 105.8 | mJ |
| $I_{AS}$ | Avalanche Current | 46 | A |
| $P_D$@$T_A$=25°C | Total Power Dissipation[4] | 1.5 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | °C |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | °C |

### Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|--------|-----------|------|------|------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient [1] | --- | 85 | °C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case[1] | --- | 25 | °C/W |

## Electrical Characteristics ($T_J$=25 ℃, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=250uA | 30 | --- | --- | V |
| $\triangle BV_{DSS}/\triangle T_J$ | BVDSS Temperature Coefficient | Reference to 25℃ , $I_D$=1mA | --- | 0.028 | --- | V/℃ |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance[2] | $V_{GS}$=10V , $I_D$=12A | --- | --- | 6 | mΩ |
| | | $V_{GS}$=4.5V , $I_D$=10A | --- | --- | 10 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =250uA | 1.2 | --- | 2.5 | V |
| $\triangle V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | --- | -6.16 | --- | V/℃ |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=24V , $V_{GS}$=0V , $T_J$=25℃ | --- | --- | 1 | uA |
| | | $V_{DS}$=24V , $V_{GS}$=0V , $T_J$=55℃ | --- | --- | 5 | |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| gfs | Forward Transconductance | $V_{DS}$=5V , $I_D$=12A | --- | 47 | --- | S |
| $R_g$ | Gate Resistance | $V_{DS}$=0V , $V_{GS}$=0V , f=1MHz | --- | 1.7 | --- | Ω |
| $Q_g$ | Total Gate Charge (4.5V) | $V_{DS}$=15V , $V_{GS}$=4.5V , $I_D$=10A | --- | 21 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 7 | --- | |
| $Q_{gd}$ | Gate-Drain Charge | | --- | 6.9 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}$=15V , $V_{GS}$=10V , $R_G$=3.3Ω $I_D$=10A | --- | 9.6 | --- | ns |
| $T_r$ | Rise Time | | --- | 8.6 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 59 | --- | |
| $T_f$ | Fall Time | | --- | 15.6 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=15V , $V_{GS}$=0V , f=1MHz | --- | 2295 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 267 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 210 | --- | |

## Diode Characteristics

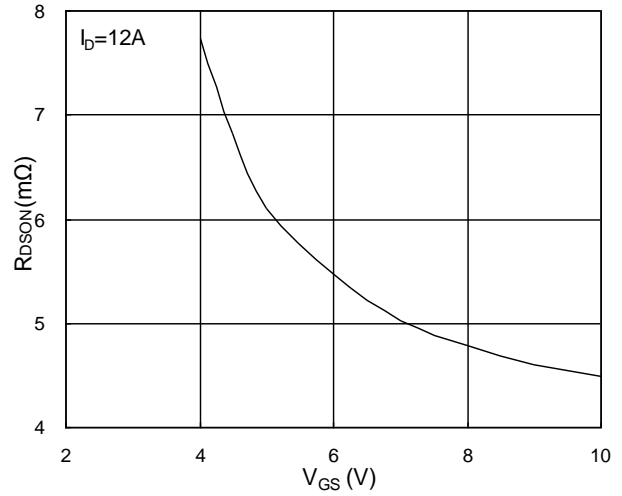| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current[1,5] | $V_G$=$V_D$=0V , Force Current | --- | --- | 13 | A |
| $I_{SM}$ | Pulsed Source Current[2,5] | | --- | --- | 65 | A |
| $V_{SD}$ | Diode Forward Voltage[2] | $V_{GS}$=0V , $I_S$=1A , $T_J$=25℃ | --- | --- | 1.2 | V |
| $t_{rr}$ | Reverse Recovery Time | IF=10A , dI/dt=100A/µs , $T_J$=25℃ | --- | 12 | --- | nS |
| $Q_{rr}$ | Reverse Recovery Charge | | --- | 4.8 | --- | nC |

Note :

1.The data tested by surface mounted on a 1 inch[2] FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is $V_{DD}$=25V,$V_{GS}$=10V,L=0.1mH,$I_{AS}$=46A

4.The power dissipation is limited by 150℃ 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.

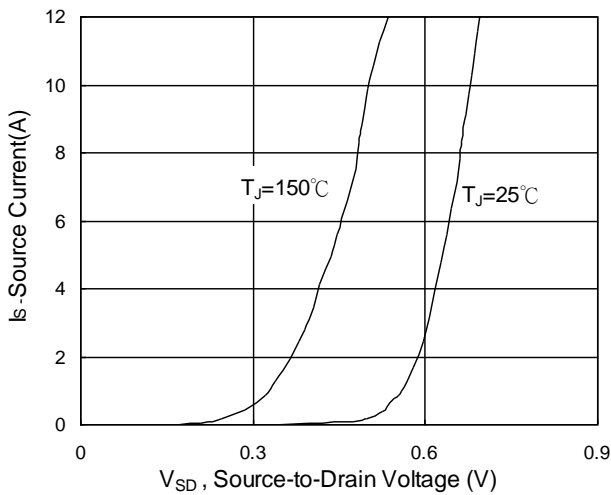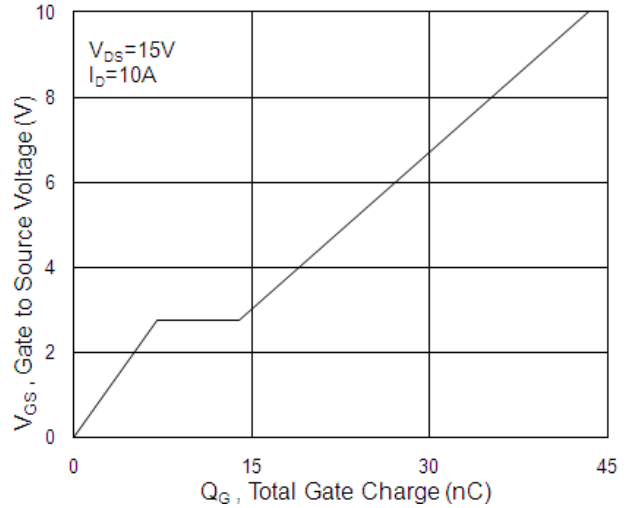## Typical Characteristics



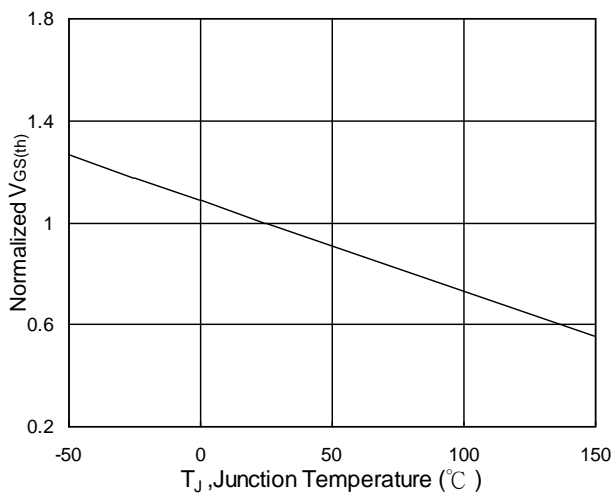**Fig.1 Typical Output Characteristics**



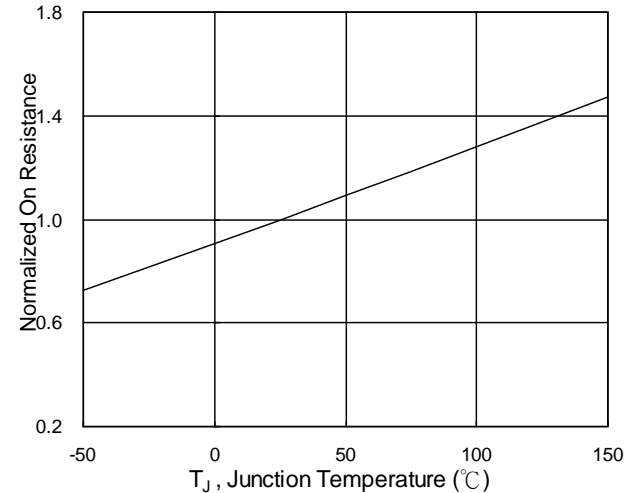**Fig.2 On-Resistance vs. Gate-Source**
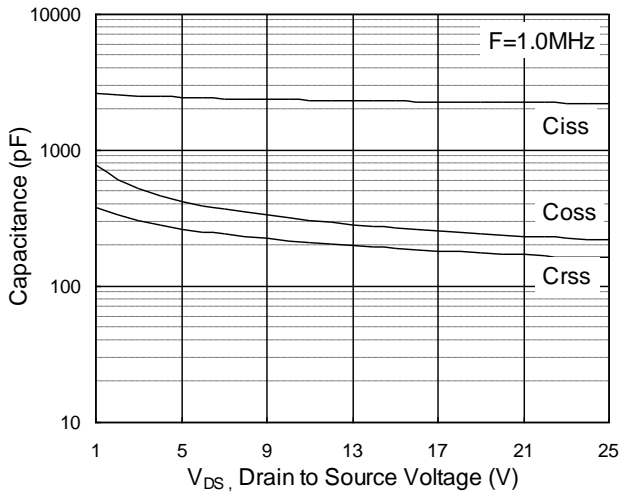


**Fig.3 Forward Characteristics of Reverse**
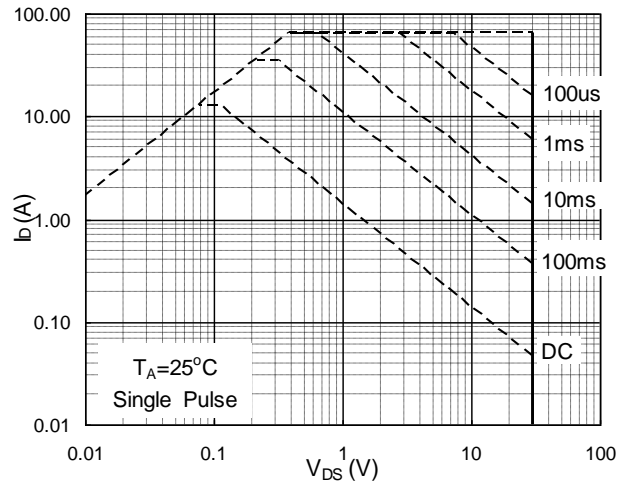


**Fig.4 Gate-Charge Characteristics**



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



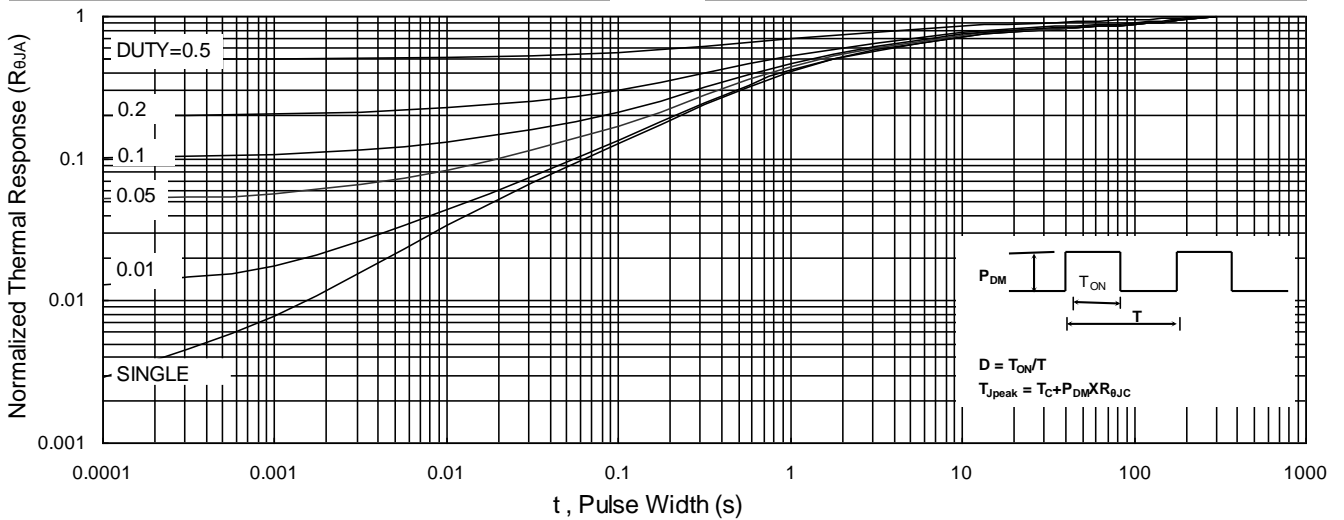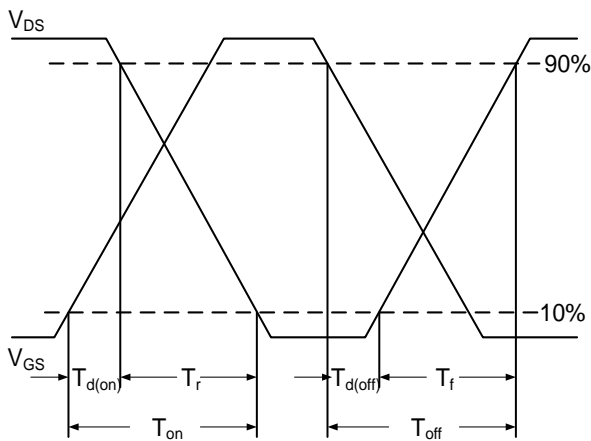**Fig.6 Normalized $R_{DSON}$ vs. $T_J$**

Data and specifications subject to change without notice.
www.fetek.com.tw   Ver : A

3

**Fig.7 Capacitance**



**Fig.8 Safe Operating Area**



$$D = T_{ON}/T$$
$$T_{Jpeak} = T_C + P_{DM} X R_{\theta JC}$$

**Fig.9 Normalized Maximum Transient Thermal Impedance**



**Fig.10 Switching Time Waveform**

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



**Fig.11 Unclamped Inductive Switching Waveform**