

**N-Ch 100V Fast Switching MOSFETs**

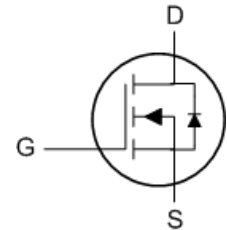
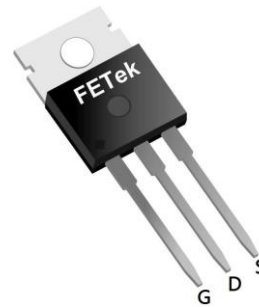
- ★ 100% EAS Guaranteed
- ★ Low  $R_{DS(ON)}$
- ★ Low Gate Charge
- ★ RoHs and Halogen-Free Compliant

**Product Summary**


BVDSS	RDSON	ID
100V	9mΩ	80A

**Description**

The FKP0048 is the high cell density trenched N-ch MOSFETs, which provide excellent  $R_{DS(ON)}$  and gate charge for most of the Synchronous Rectification for AC/DC Quick Charger.

**TO220 Pin Configuration**

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	±20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current <sup>1,6</sup>	80	A
$I_D@T_C=100^\circ C$	Continuous Drain Current <sup>1,6</sup>	70.7	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	350	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	61	mJ
$I_{AS}$	Avalanche Current	35	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	188	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
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	---	58	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	0.8	°C/W

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	100	---	---	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V , I <sub>D</sub> =13.5A	---	6.6	9	mΩ
	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =4.5V , I <sub>D</sub> =11.5A	---	8.7	12	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.2	---	2.3	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =80V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =80V , V <sub>GS</sub> =0V , T <sub>J</sub> =55°C	---	---	5	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V , I <sub>D</sub> =20A	---	85	---	S
Q <sub>g</sub>	Total Gate Charge (10V)	V <sub>DS</sub> =50V , V <sub>GS</sub> =10V , I <sub>D</sub> =13.5A	---	45	---	nC
Q <sub>g</sub>	Total Gate Charge (4.5V)		---	19.3	---	
Q <sub>gs</sub>	Gate-Source Charge		---	9.5	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	4.8	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =50V , V <sub>GS</sub> =10V , R <sub>G</sub> =3Ω, I <sub>D</sub> =13.5A	---	10	---	ns
T <sub>r</sub>	Rise Time		---	6.5	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	45	---	
T <sub>f</sub>	Fall Time		---	7.5	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V , V <sub>GS</sub> =0V , f=1MHz	---	3320	---	pF
C <sub>oss</sub>	Output Capacitance		---	605	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	20	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current <sup>1,5,6</sup>	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	80	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V , I <sub>S</sub> =1A , T <sub>J</sub> =25°C	---	---	1.1	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =13.5A , di/dt=100A/μs ,	---	33	---	nS
Q <sub>rr</sub>	Reverse Recovery Charge	T <sub>J</sub> =25°C	---	150	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> 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<sub>DD</sub>=25V,V<sub>GS</sub>=10V,L=0.3mH,I<sub>AS</sub>=35A
- 4.The power dissipation is limited by junction temperature
- 5.The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.
- 6.The maximum current rating is package limited.

Typical Characteristics

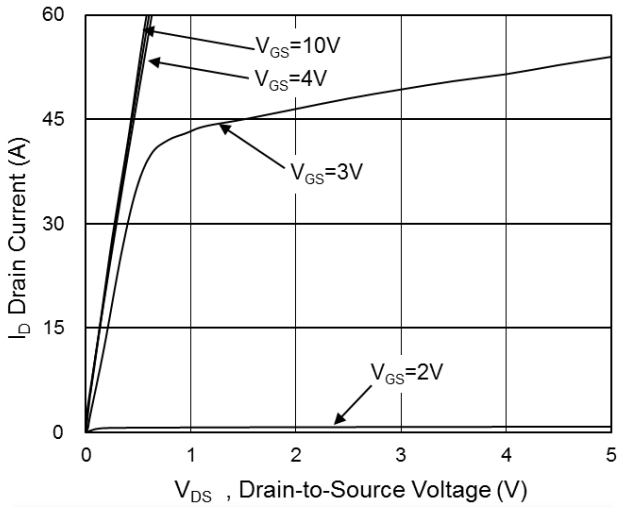


Fig.1 Typical Output Characteristics

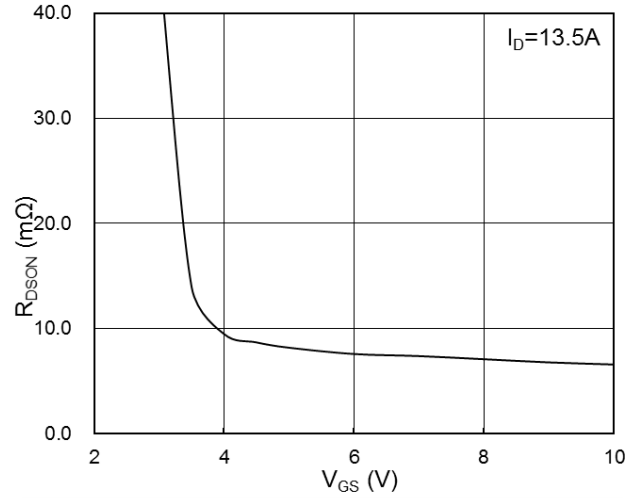


Fig.2 On-Resistance vs. G-S Voltage

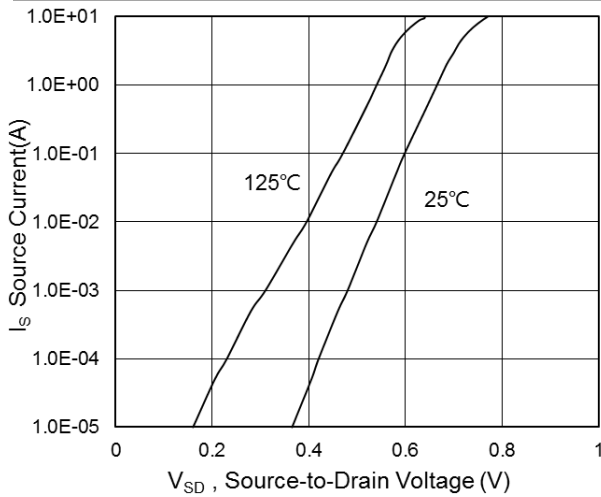


Fig.3 Source-Drain Forward Characteristics

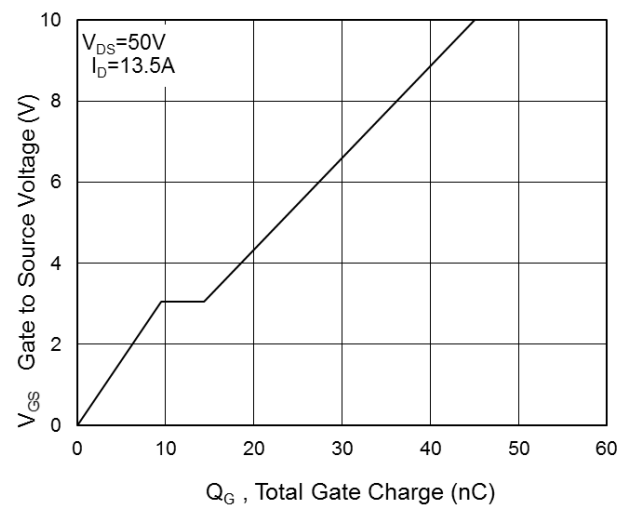


Fig.4 Gate-Charge Characteristics

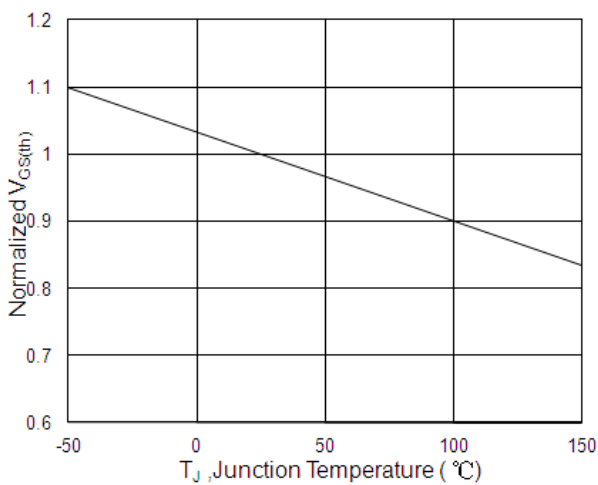


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

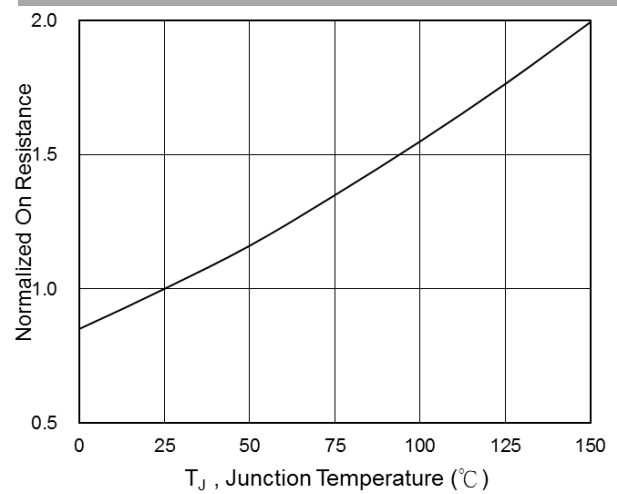


Fig.6 Normalized  $R_{DSON}$  vs.  $T_J$

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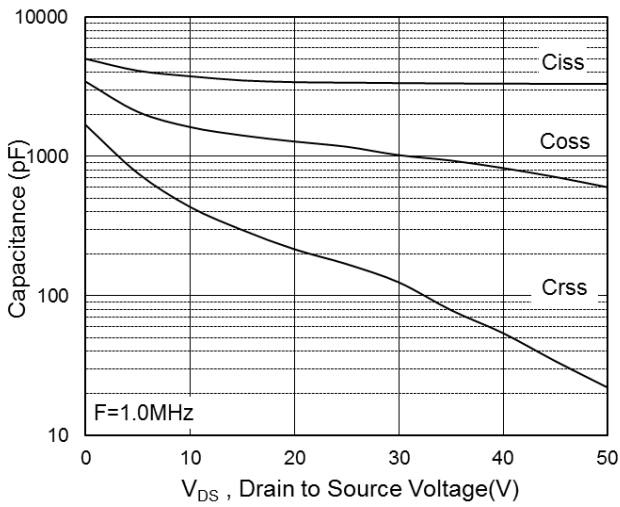


Fig.7 Capacitance

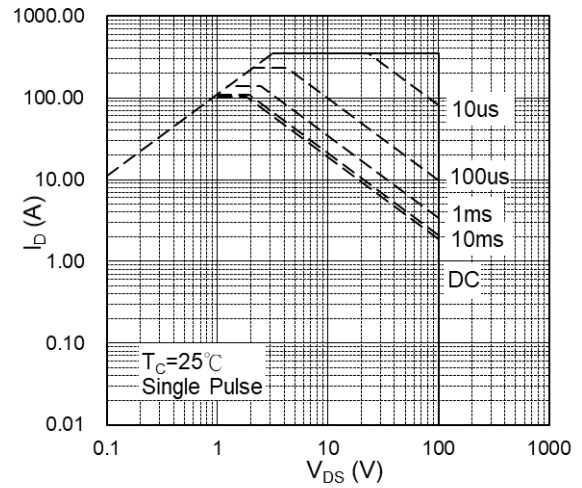


Fig.8 Safe Operating Area

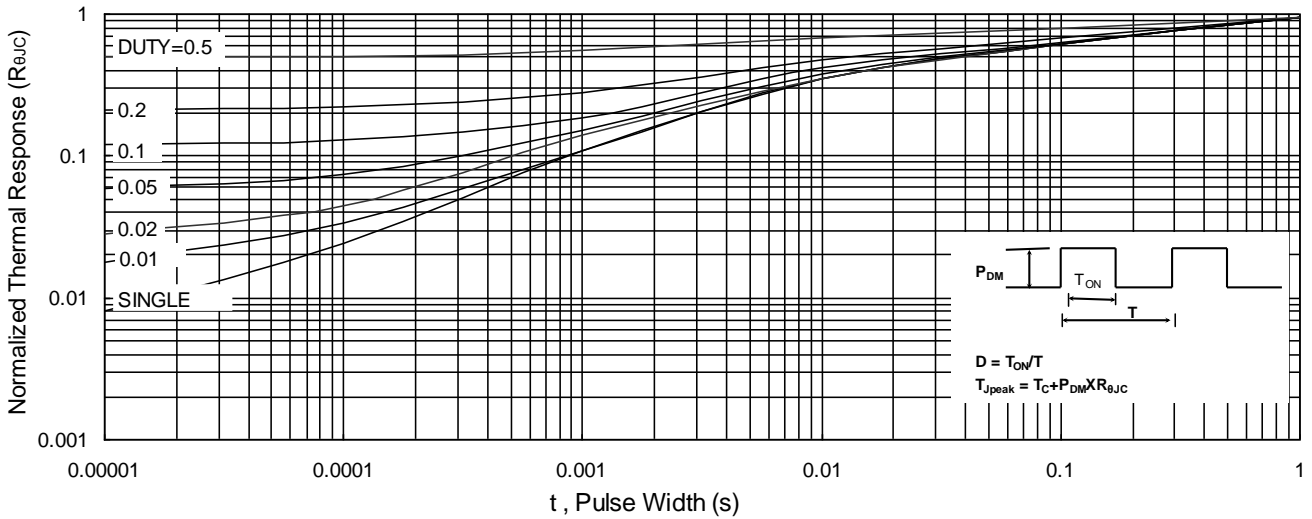


Fig.9 Normalized Maximum Transient Thermal Impedance



Fig.10 Switching Time Waveform

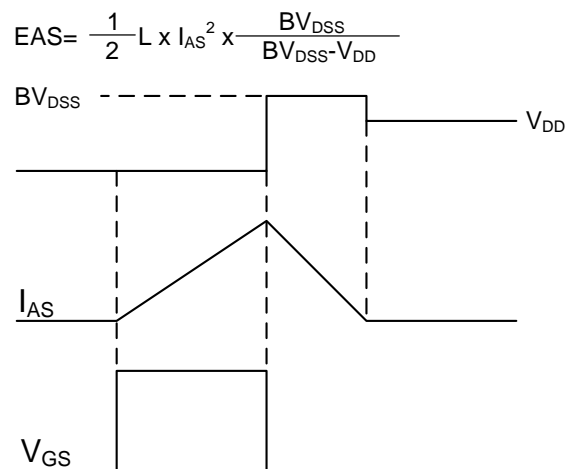
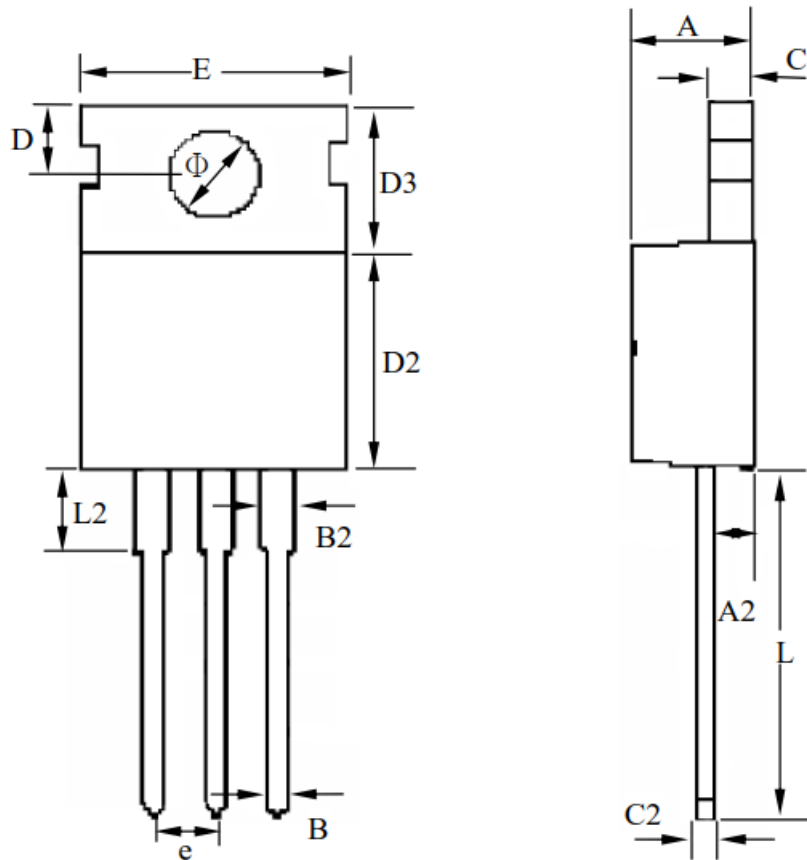


Fig.11 Unclamped Inductive Switching Waveform

## TO220 Package Outline Dimensions



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.25	--	4.80	0.167	--	0.189
A2	2.20	--	2.92	0.087	--	0.115
B	0.70	--	0.91	0.028	--	0.036
B2	1.15	--	1.77	0.045	--	0.070
C	1.20	--	1.40	0.047	--	0.055
C2	0.45	--	0.61	0.018	--	0.024
D	2.54	--	3.00	0.100	--	0.118
D2	8.39	--	9.47	0.330	--	0.373
D3	6.30	--	6.70	0.248	--	0.264
E	9.70	--	10.36	0.382	--	0.408
L	12.75	--	14.40	0.502	--	0.567
L2	2.45	--	4.05	0.096	--	0.159
Φ	3.50	--	3.80	0.138	--	0.150
e	--	2.54	--	--	0.100	--

## Marking Instruction

