



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

Product Summary



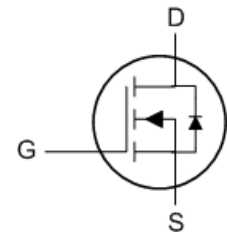
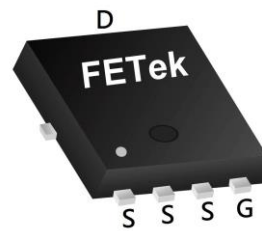
BVDSS	R _{DS(on)}	I _D
40V	3.3mΩ	85A

Description

The FKBA4024A 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 FKBA4024A meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

PRPAK5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	40	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current ^{1,6}	85	A
I _D @T _C =100°C	Continuous Drain Current ^{1,6}	67	A
I _{DM}	Pulsed Drain Current ²	250	A
EAS	Single Pulse Avalanche Energy ³	125	mJ
I _{AS}	Avalanche Current	50	A
P _D @T _C =25°C	Total Power Dissipation ⁴	83	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 _{θJA}	Thermal Resistance Junction-Ambient ¹	---	62	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	1.5	°C/W

**Electrical Characteristics (T_J=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	40	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =30A	---	2.5	3.3	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2	---	4	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =48V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =48V , V _{GS} =0V , T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V , I _D =30A	---	53	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	0.8	---	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =32V , V _{GS} =10V , I _D =20A	---	65	---	nC
Q _{gs}	Gate-Source Charge		---	24	---	
Q _{gd}	Gate-Drain Charge		---	21	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =20V , V _{GS} =10V , R _G =3.3Ω, I _D =30A	---	26	---	ns
T _r	Rise Time		---	38	---	
T _{d(off)}	Turn-Off Delay Time		---	63	---	
T _f	Fall Time		---	20	---	
C _{iSS}	Input Capacitance	V _{DS} =15V , V _{GS} =0V , f=1MHz	---	4711	---	pF
C _{oss}	Output Capacitance		---	869	---	
C _{rSS}	Reverse Transfer Capacitance		---	367	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	20	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =1A , T _J =25°C	---	---	1.2	V
t _{rr}	Reverse Recovery Time	I _F =30A , dI/dt=100A/μs ,	---	20.3	---	nS
Q _{rr}	Reverse Recovery Charge	T _J =25°C	---	9.5	---	nC

Note :

- The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=50A
- The power dissipation is limited by 150°C junction temperature
- The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
- Package limitation current is 85A.

Typical Characteristics

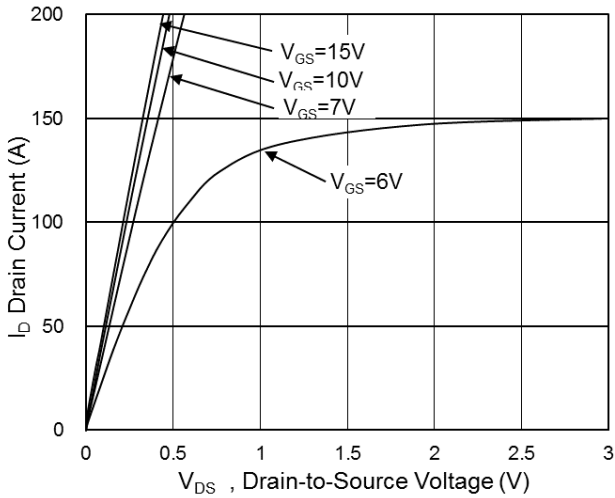


Fig.1 Typical Output Characteristics

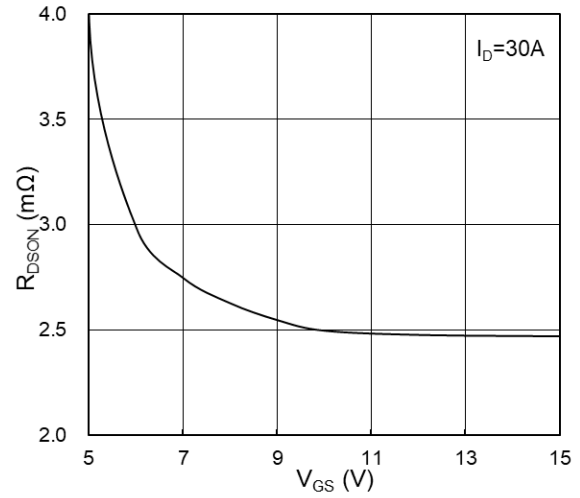


Fig.2 On-Resistance vs G-S Voltage

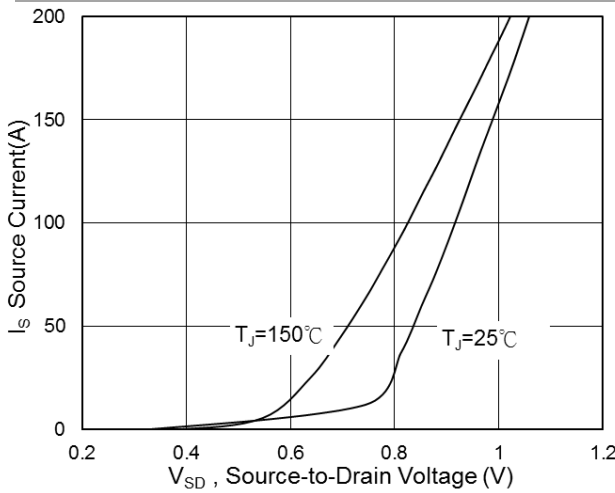


Fig.3 Source Drain Forward Characteristics

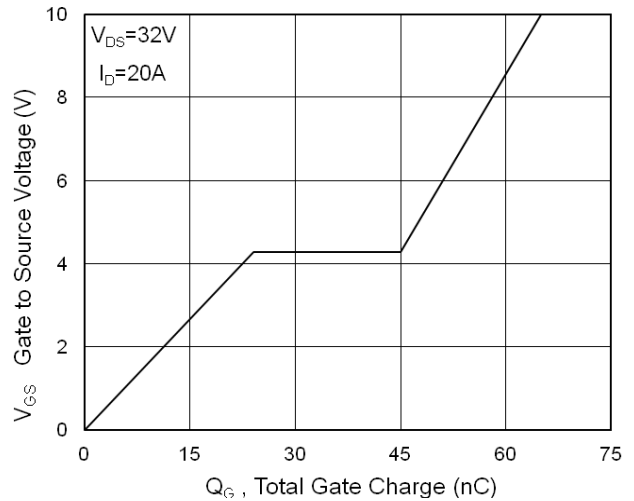


Fig.4 Gate-Charge Characteristics

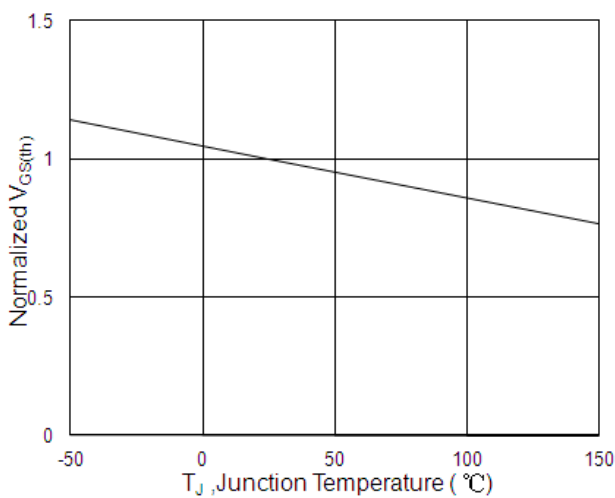


Fig.5 Normalized $V_{GS(th)}$ vs T_J

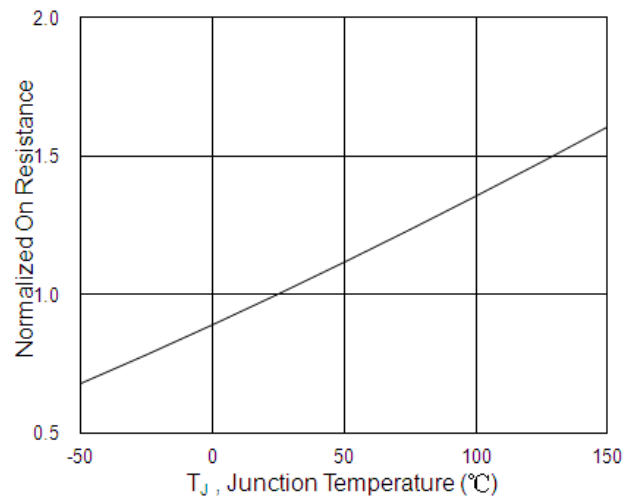


Fig.6 Normalized $R_{DS(on)}$ vs T_J

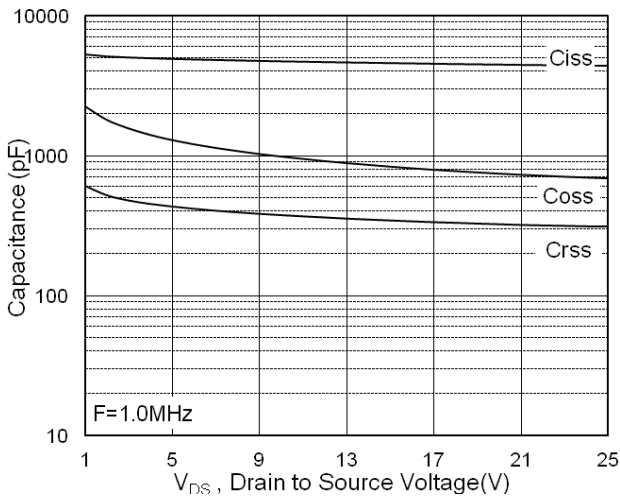


Fig.7 Capacitance

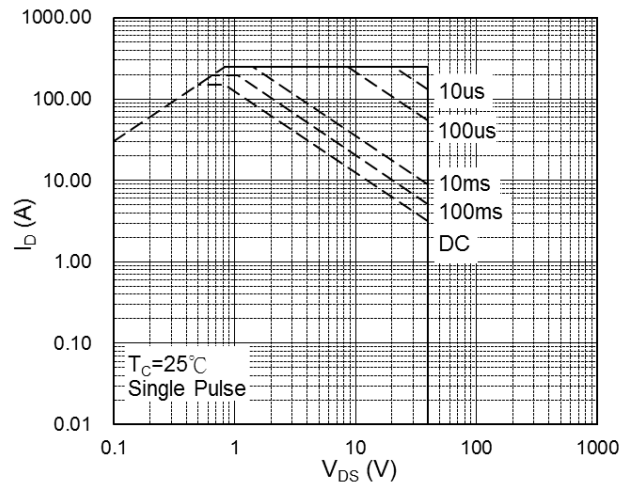


Fig.8 Safe Operating Area

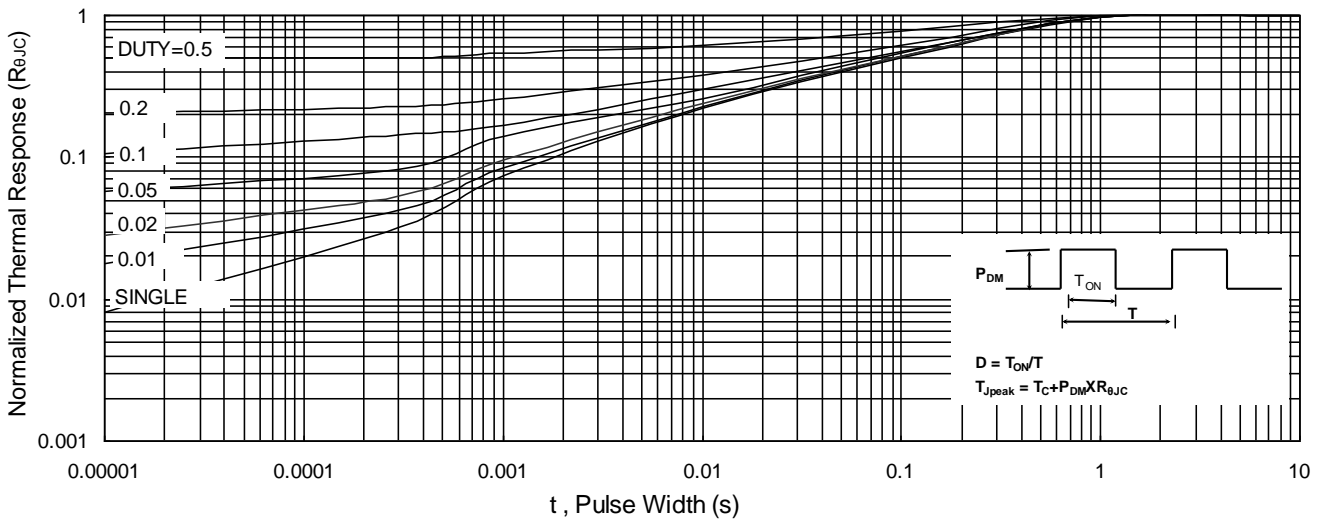


Fig.9 Normalized Maximum Transient Thermal Impedance

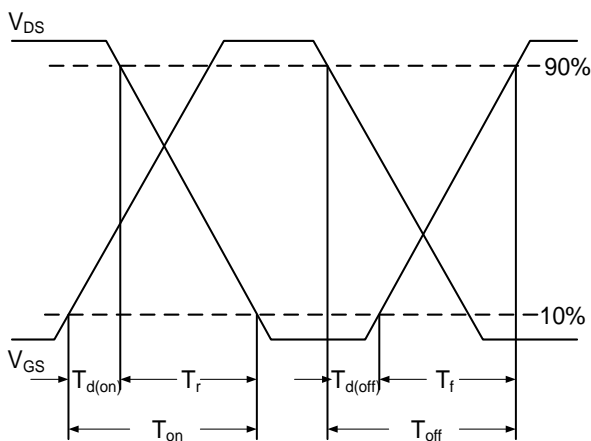


Fig.10 Switching Time Waveform

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

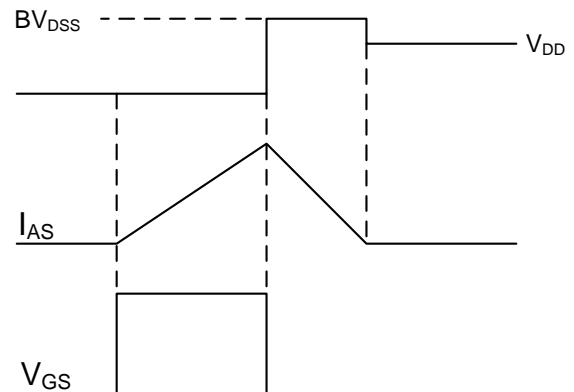


Fig.11 Unclamped Inductive Switching Waveform