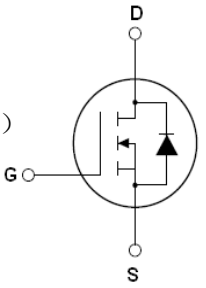
Feathers:

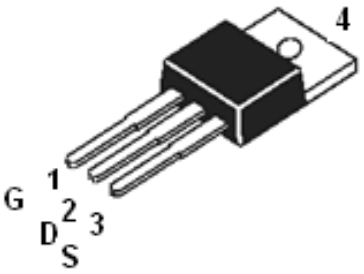
- Advanced trench process technology
- Special designed for Convertors and power controls
- High density cell design for ultra low Rdson
- Fully characterized Avalanche voltage and current
- Avalanche Energy 100% test

ID=200A
BV=40V
Rdson=4 mΩ（max.）



Description:

The FTK4004 is a new generation of high voltage and low current N–Channel enhancement mode trench power MOSFET. This new technology increases the device reliability and electrical parameter repeatability. FTK4004 is assembled in high reliability and qualified assembly house.



FTK4004 TOP View (TO220)

Application:

- Power switching application
- Commercial-industrial application

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D@T_c=25℃	Continuous drain current,VGS@10V	200	A
I_D@T_c=100℃	Continuous drain current,VGS@10V	140	
I_{DM}	Pulsed drain current ①	800	
P_D@T_C=25℃	Power dissipation	150	W
	Linear derating factor	2.0	W/℃
V_{GS}	Gate-to-Source voltage	±20	V
dv/dt	Peak diode recovery voltage	29	v/ns
E_{AS}	Single pulse avalanche energy ②	520	mJ
E_{AR}	Repetitive avalanche energy	TBD	
T_J T_{STG}	Operating Junction and Storage Temperature Range	–55 to +150	℃

Thermal Resistance

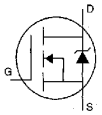
	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	0.83	—	℃/W
$R_{\theta JA}$	Junction-to-ambient	—	—	62	

Electrical Characteristics @TJ=25 ℃(unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source breakdown voltage	40	—	—	V	V_{GS}=0V,I_D=250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	3.5	4	mΩ	V_{GS}=10V,I_D=30A
$V_{GS(th)}$	Gate threshold voltage	2.0	—	4.0	V	V_{DS}=V_{GS},I_D=250μA
I_{DSS}	Drain-to-Source leakage current	—	—	2	uA	V_{DS}=40V,V_{GS}=0V
		—	—	10		V_{DS}=40V, V_{GS}=0V,T_J=150℃
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS}=20V
	Gate-to-Source reverse leakage	—	—	-100		V_{GS}=-20V

Q_g	Total gate charge	—	90	—	nC	I_D=30A
Q_{gs}	Gate-to-Source charge	—	14	—		V_{DD}=30V
Q_{gd}	Gate-to-Drain("Miller") charge	—	24	—		V_{GS}=10V
$t_{d(on)}$	Turn-on delay time	—	18.2	—	nS	V_{DD}=30V
t_r	Rise time	—	15.6	—		I_D=2A ,R_L=15Ω
$t_{d(off)}$	Turn-Off delay time	—	70.5	—		R_G=2.5Ω
t_f	Fall time	—	13.8	—		V_{GS}=10V
C_{iss}	Input capacitance	—	3150	—	pF	V_{GS}=0V
C_{oss}	Output capacitance	—	300	—		V_{DS}=25V
C_{rss}	Reverse transfer capacitance	—	240	—		f=1.0MHZ

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	200	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	800		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J=25℃,I_S=30A,V_{GS}=0V ③
t_{rr}	Reverse Recovery Time	—	57	—	nS	T_J=25℃,I_F=57A di/dt=100A/μs ③
Q_{rr}	Reverse Recovery Charge	—	107	—	μC	
t_{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by Ls + LD)				

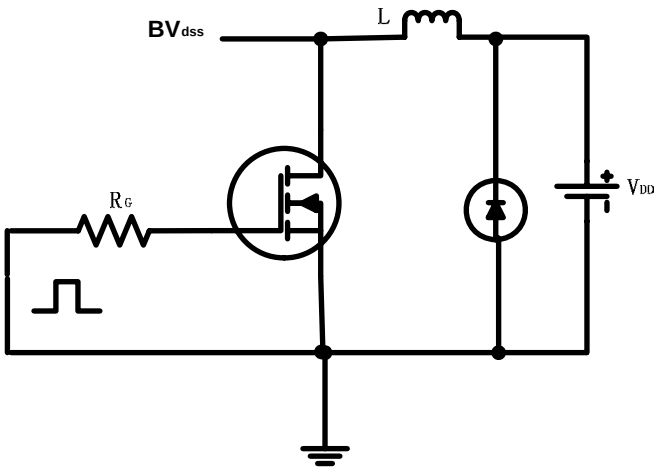
Notes:

① Repetitive rating; pulse width limited by max junction temperature.

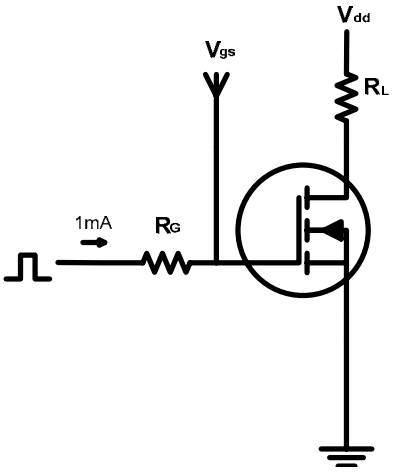
② Test condition: L =0.3mH, ID = 59A, VDD = 20V

③ Pulse width≤300μS; duty cycle≤1.5% RG = 25ΩStarting TJ = 25°C

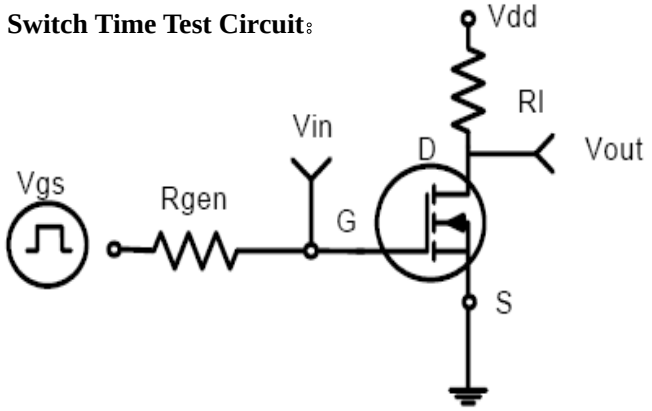
EAS test circuits:



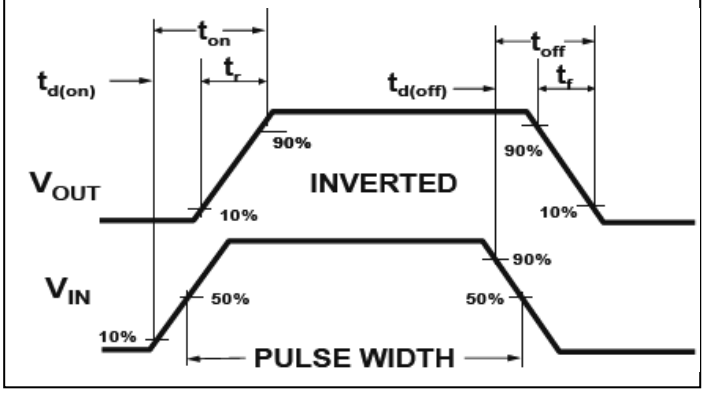
Gate charge test circuit:

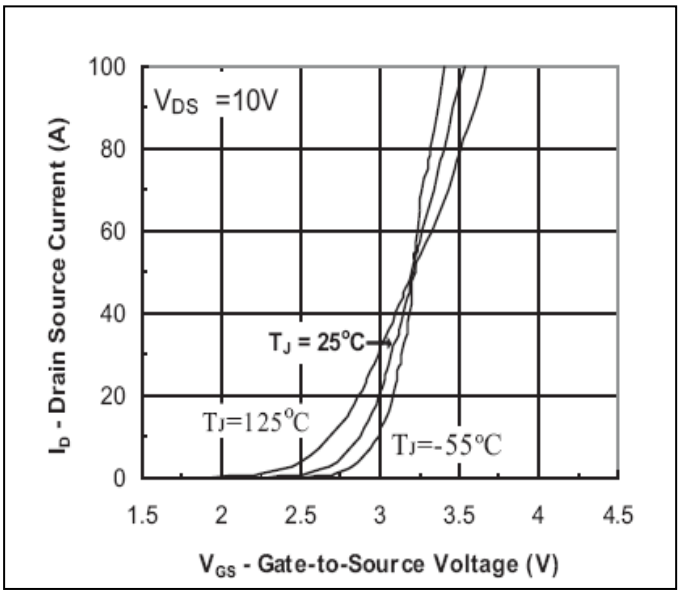


Switch Time Test Circuit:

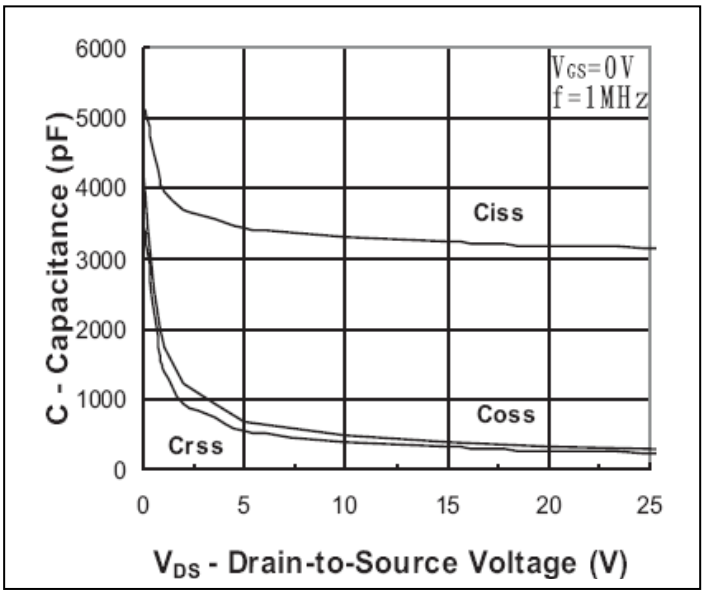


Switch Waveforms:

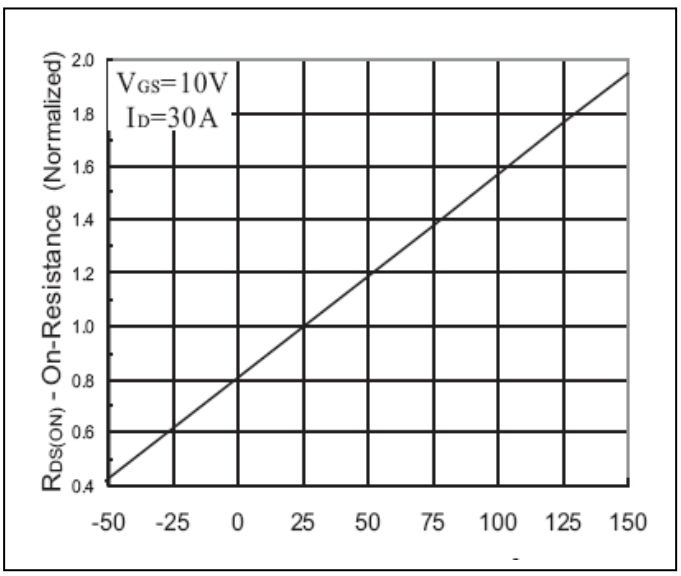




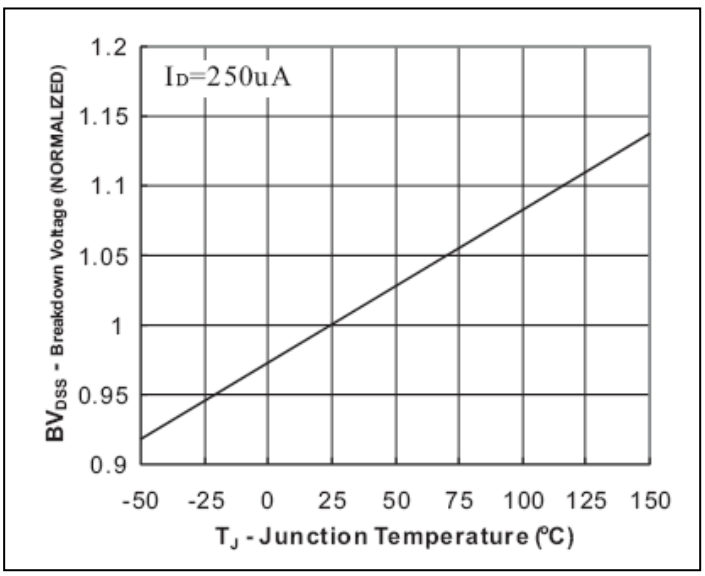
Transfer Characteristic



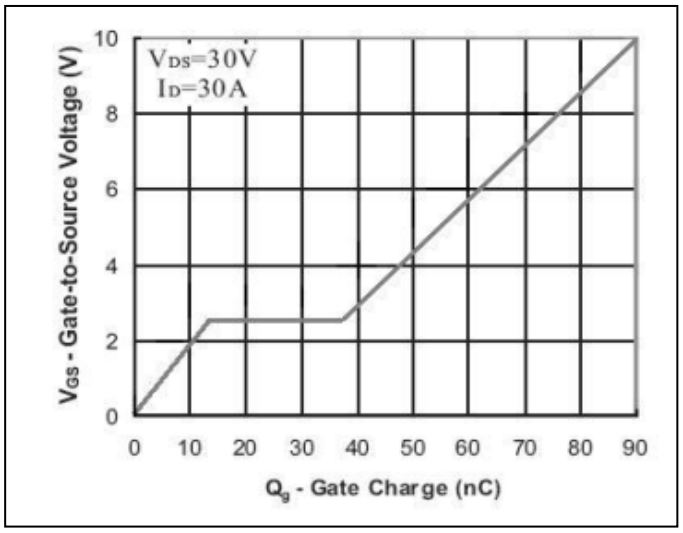
Capacitance



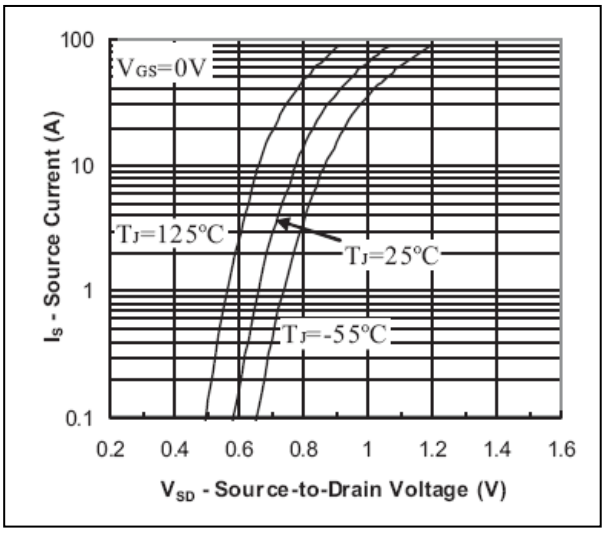
On Resistance vs Junction Temperature



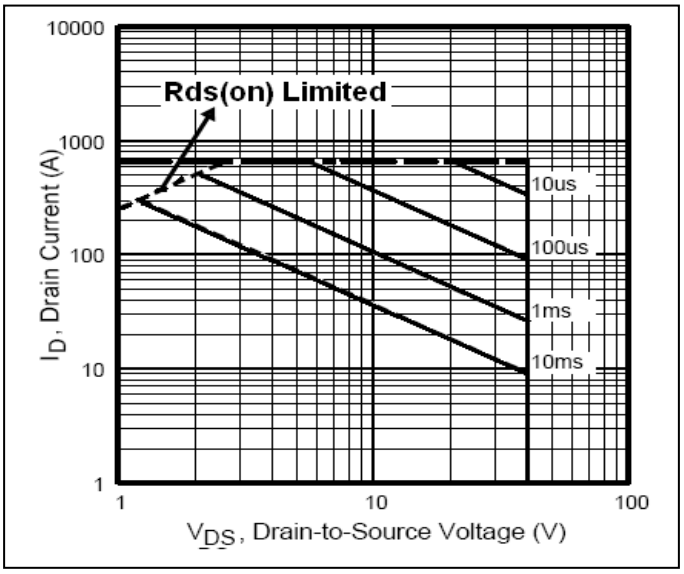
Breakdown Voltage vs Junction Temperature



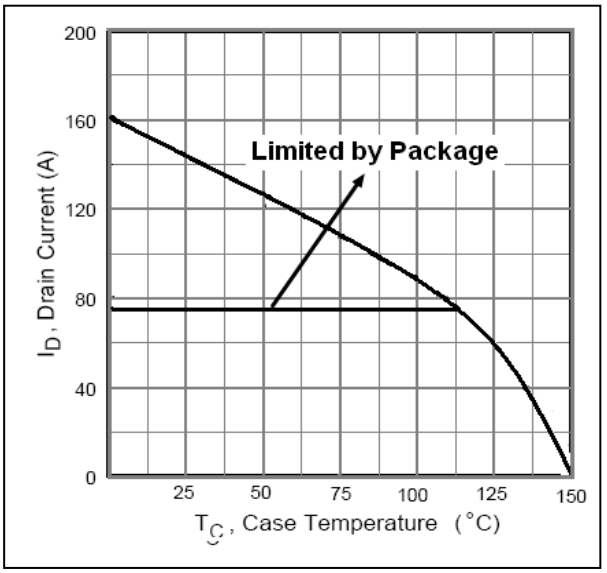
Gate Charge



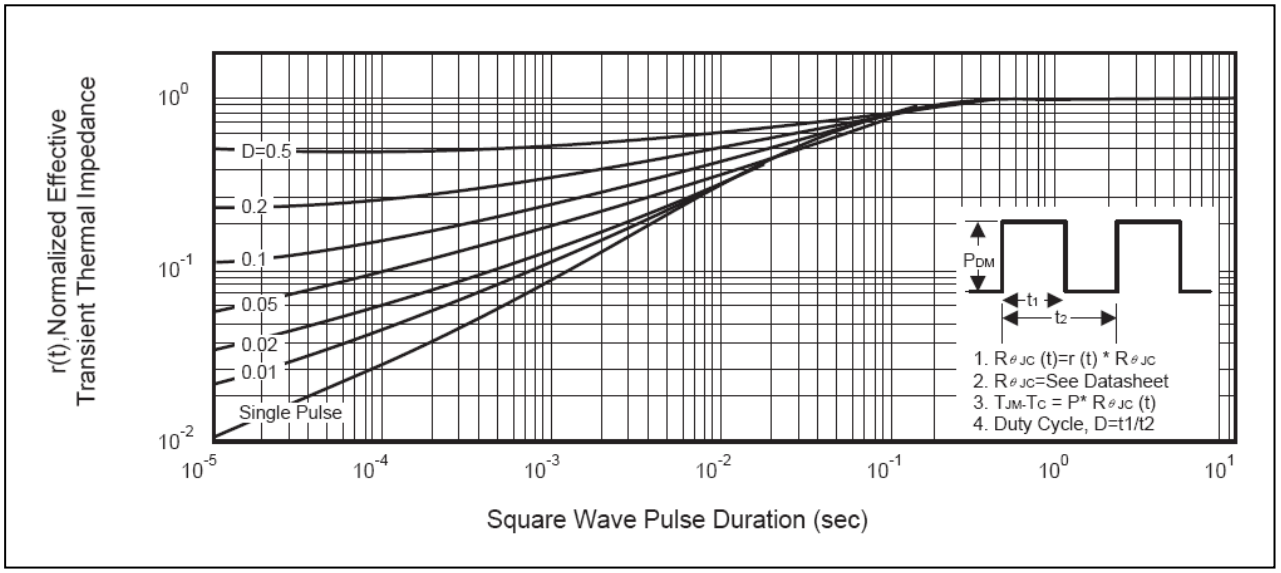
Source-Drain Diode Forward Voltage



Safe Operation Area



Max Drain Current vs Junction Temperature



Transient Thermal Impedance Curve

TO220 MECHANICAL DATA: