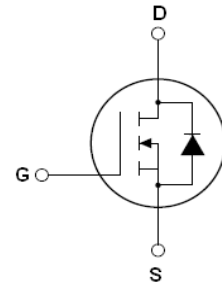


### Feathers:

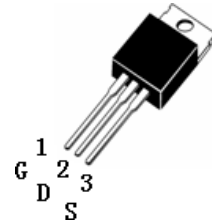
- Advanced trench process technology
- Special designed for Convertors and power controls
- High density cell design for ultra low Rdson
- Fully characterized Avalanche voltage and current
- Avalanche Energy 100% test

**ID =15A**  
**BV=100V**  
**Rdson=0.06Ω (Typ.)**



### Description:

The FTK1090 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. FTK1090 is assembled in high reliability and qualified assembly house.



FTK1090 TOP View (TO-220)

### Application:

- Power switching application

### Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D@T_c=25^\circ\text{C}$	Continuous drain current, VGS@10V	15	A
$I_D@T_c=100^\circ\text{C}$	Continuous drain current, VGS@10V	10	
$I_{DM}$	Pulsed drain current ①	60	
$P_D@T_c=25^\circ\text{C}$	Power dissipation	42	W
	Linear derating factor	0.4	W/ °C
$V_{GS}$	Gate-to-Source voltage	±20	V
$E_{AS}$	Single pulse avalanche energy ②	240	mJ
$E_{AR}$	Repetitive avalanche energy	TBD	mJ
dv/dt	Peak diode recovery voltage	28	v/ns
$T_J$ $T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +175	°C

### Thermal Resistance

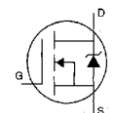
	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	3.6	—	°C/W
$R_{\theta JA}$	Junction-to-ambient	—	—	69	

\*When mounted on the minimum pas size recommended (PCB Mount)

## Electrical Characteristics @T<sub>J</sub>=25°C unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV <sub>DSS</sub>	Drain-to-Source breakdown voltage	100	—	—	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
R <sub>DS(on)</sub>	Static Drain-to-Source on-resistance	—	0.06	0.09	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =2A
V <sub>GS(th)</sub>	Gate threshold voltage	2.0	—	4.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
I <sub>DSS</sub>	Drain-to-Source leakage current	—	—	1	μA	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V
		—	—	10		V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>J</sub> =150°C
I <sub>GSS</sub>	Gate-to-Source forward leakage	—	—	100	nA	V <sub>GS</sub> =20V
	Gate-to-Source reverse leakage	—	—	-100		V <sub>GS</sub> =-20V
Q <sub>g</sub>	Total gate charge	—	21.18		nC	I <sub>D</sub> =9.2A, V <sub>GS</sub> =10V V <sub>DD</sub> =80V, R <sub>L</sub> =8.6Ω
Q <sub>gs</sub>	Gate-to-Source charge	—	4.7	—		
Q <sub>gd</sub>	Gate-to-Drain("Miller") charge	—	8.5	—		
t <sub>d(on)</sub>	Turn-on delay time	—	10		nS	V <sub>DD</sub> =50V I <sub>D</sub> =9.2A, R <sub>L</sub> =5.4Ω R <sub>G</sub> =18Ω V <sub>GS</sub> =10V
t <sub>r</sub>	Rise time	—	9.5			
t <sub>d(off)</sub>	Turn-Off delay time	—	18.3			
t <sub>f</sub>	Fall time	—	4.2			
C <sub>iss</sub>	Input capacitance	—	697	750	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =25V f=1.0MHZ
C <sub>oss</sub>	Output capacitance	—	59	110		
C <sub>rss</sub>	Reverse transfer capacitance	—	43	45		

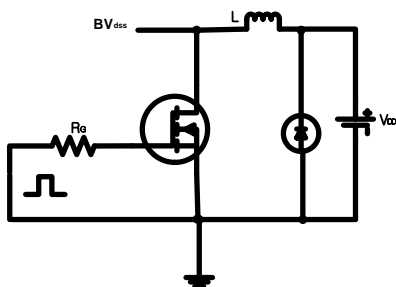
## Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	3	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode) ①	—	—	18		
V <sub>SD</sub>	Diode Forward Voltage	—	—	1.3	V	T <sub>J</sub> =25°C, I <sub>S</sub> =3A, V <sub>GS</sub> =0V ③
t <sub>rr</sub>	Reverse Recovery Time	—	35	—	nS	T <sub>J</sub> =25°C, I <sub>F</sub> =9.2A di/dt=100A/μs③
Q <sub>rr</sub>	Reverse Recovery Charge	—	67.2	—	μC	
t <sub>on</sub>	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by L <sub>s</sub> + L <sub>D</sub> )				

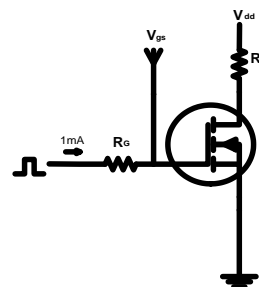
### Notes:

- ① Repetitive rating; pulse width limited by max junction temperature
- ② Test condition: L =30mH, V<sub>DD</sub> = 50V, I<sub>D</sub>=4A
- ③ Pulse width≤300μS, duty cycle≤1.5%, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C

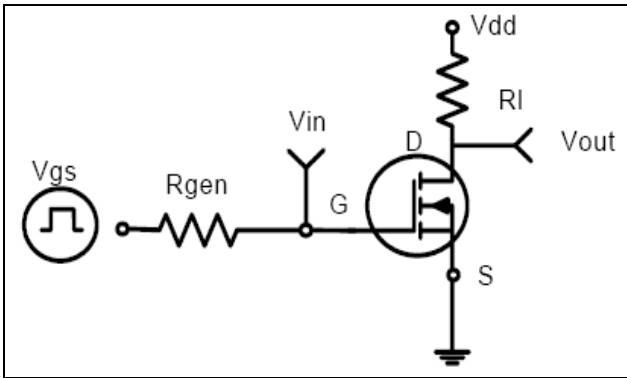
EAS Test Circuit:



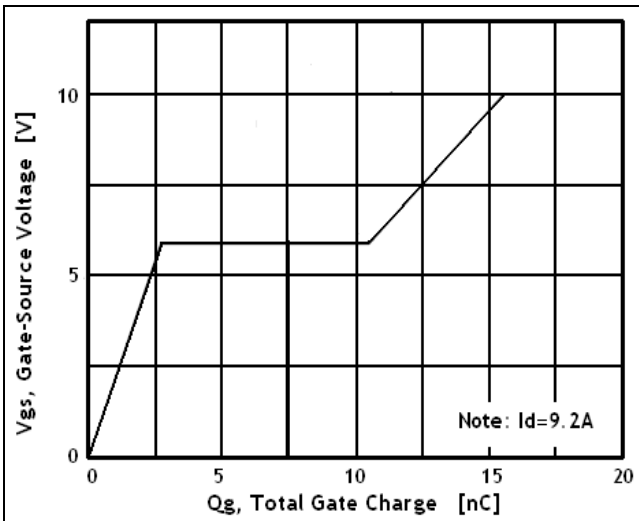
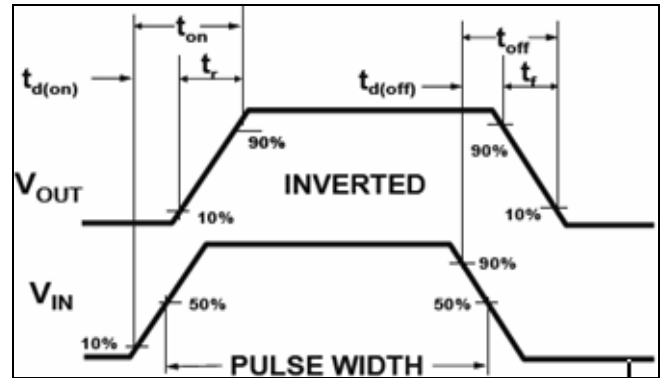
Gate Charge Test Circuit:



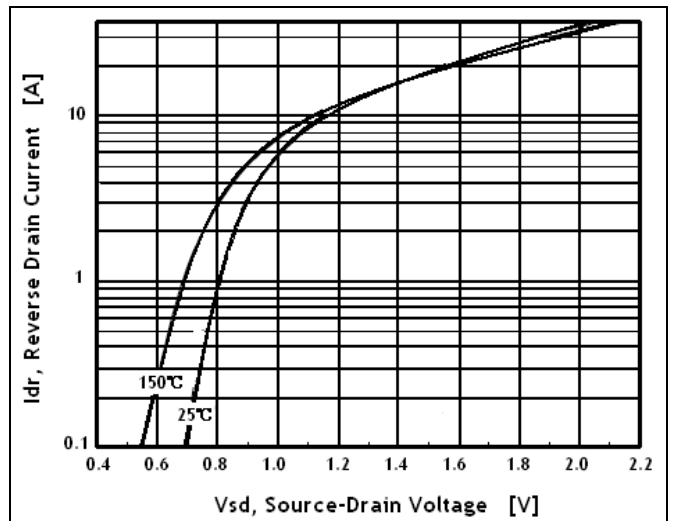
### Switch Time Test Circuit:



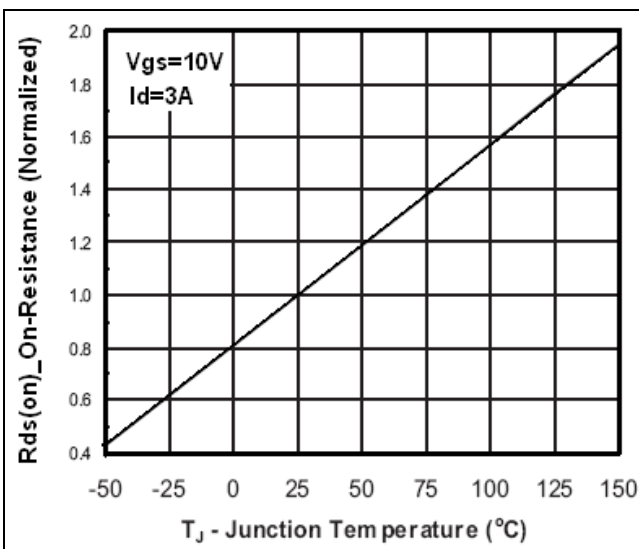
### Switch Waveform:



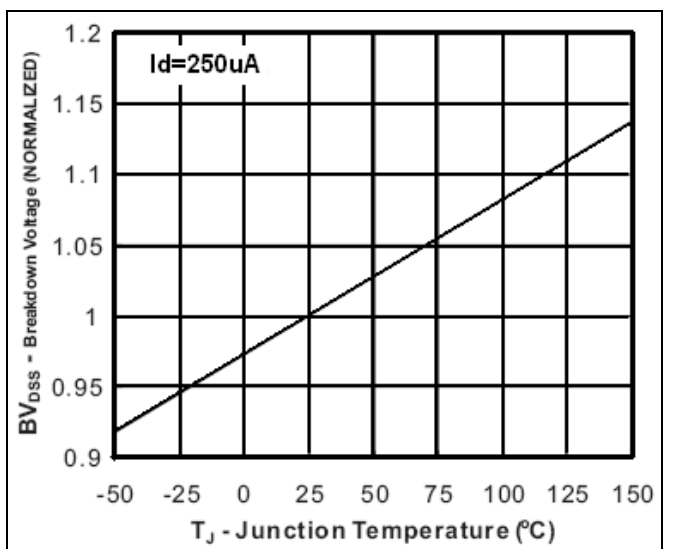
Gate Charge



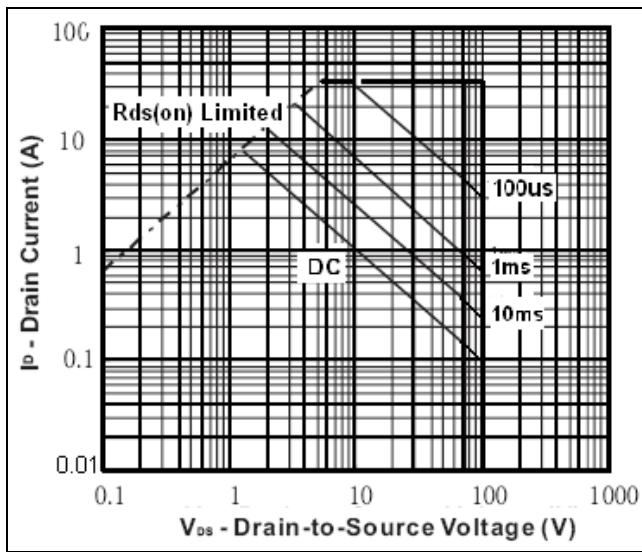
Source-Drain Diode Forward Voltage



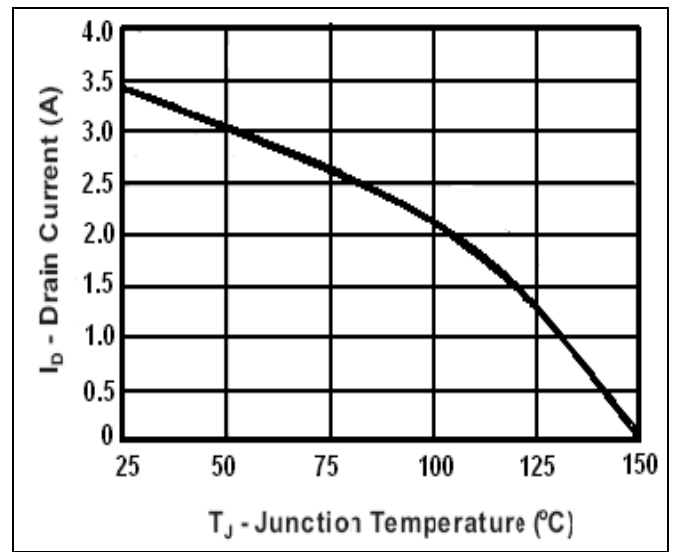
On Resistance vs. Junction Temperature



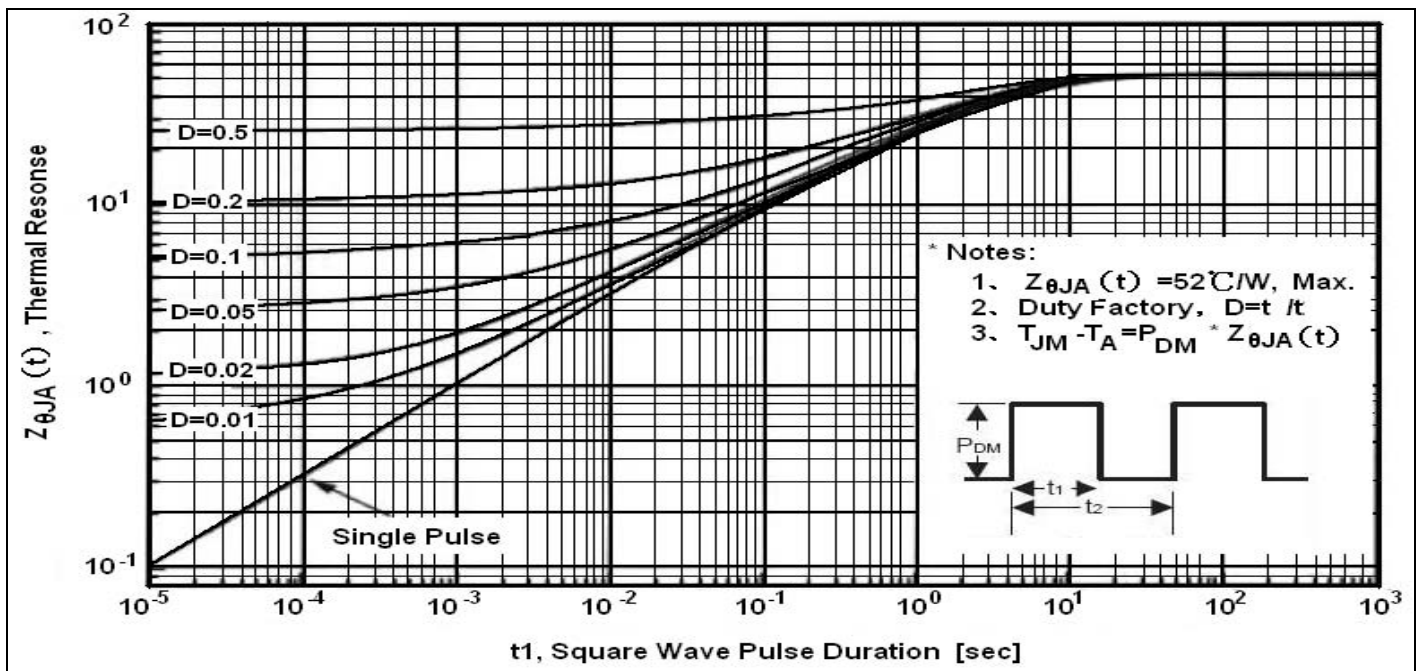
Breakdown Voltage vs. Junction Temperature



Safe Operation Area



Max Drain Current vs. Junction Temperature



Transient Thermal Impedance Curve