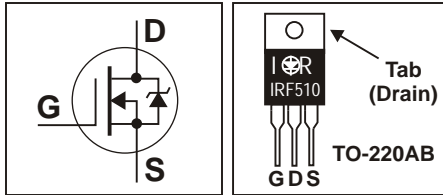


Appendix B – IRF510 Data Sheet

International Rectifier **IRF510** HEXFET® Power MOSFET

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- 175°C Operating Temperature
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements



Description

Third generation HEXFETs from International Rectifier provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-220 package is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The low thermal resistance and low package cost of the TO-220 contribute to its wide acceptance throughout the industry.

Absolute Maximum Ratings

Parameter	Maximum	Units	
ID @ Tc = 25°C	Continuous Drain Current, VGS @ 10V	5.6	A
ID @ Tc = 100°C	Continuous Drain Current, VGS @ 10V	4.0	A
IDM	Pulsed Drain Current	20	A
PD @ Tc = 25°C	Power Dissipation	43	W
VGS	Gate-to-Source Voltage	±20	V
TJ TSTG	Operating Junction and Storage Temperature Range	-55 to +175	°C

Electrical Characteristics @ TJ = 25°C

Parameter	Min.	Typ.	Max.	Test Conditions
V(BR)DSS	Drain-to-Source Breakdown Voltage	100	—	V VGS=0V
RDS(on)	Drain-to-Source On-Resistance	—	0.54	W VGS=10V, ID=3A
VGS(th)	Gate Threshold Voltage	2.0	4.0	V VDS=VGS
gfs	Forward Transconductance	1.3	—	S VDS=50V, ID=3A
IDSS	Drain-to-Source Leakage Current	—	25	IA VGS=0V @25°C
IGSS(fwd)	Gate-to-Source Forward Leakage	—	100	nA VGS=20V
IGSS(rev)	Gate-to-Source Reverse Leakage	—	-100	nA VGS=-20V

Electrical Characteristics @ TJ = 25°C – Cont'd

Parameter	Min.	Typ.	Max.	Test Conditions
LD	Internal Drain Inductance	—	4.5	nH Lead to die
LS	Internal Source Inductance	—	7.5	nH Lead to die
Ciss	Input Capacitance	—	180	pF VGS=0v, f=1MHz
Coss	Output Capacitance	—	81	pF VGS=0v, f=1MHz
Crss	Reverse Transfer Capacitance	—	15	pF VGS=0v, f=1MHz
Td(on)	Turn-on Delay Time	—	6.9	nS VDD=50v, ID=5.6A
Tr	Rise Time	—	16	nS VDD=50v, ID=5.6A
Td(off)	Turn-off Delay Time	—	15	nS VDD=50v, ID=5.6A

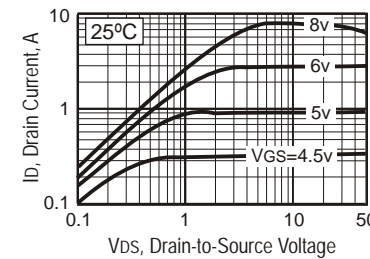


Fig. 1. Typical Output Characteristics (25°C)

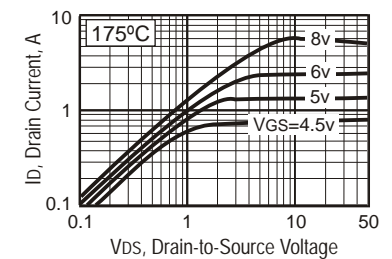


Fig. 2. Typical Output Characteristics (175°C)

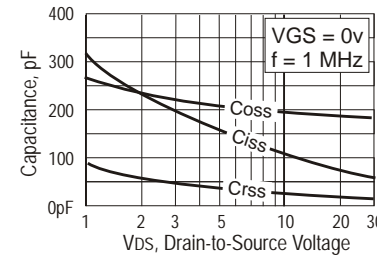


Fig. 3. Typical Capacitance vs. VDS

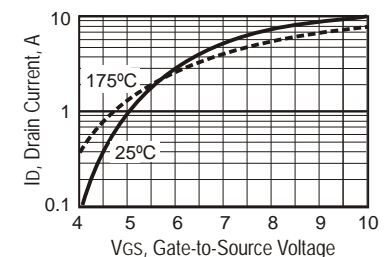


Fig. 4. Typical Transfer Characteristics

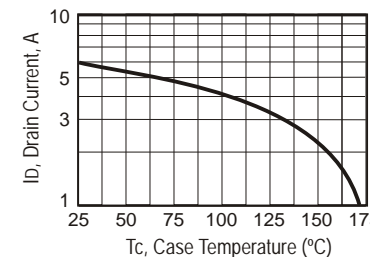


Fig. 5. Maximum Drain Current vs. Case Temperature

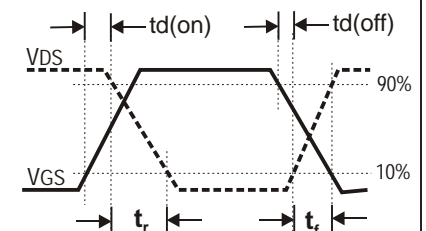


Fig. 6. Switching Time Waveforms