V_{DSS}	200 V
I_D	18 A
$R_{DS(ON)}$	125mΩ

DESCRIPTION

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

The TO-220-3L 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 -3L contribute to its wide acceptance throughout the industry.

GK xxx
IRF640

LOGO GK xxx CODE

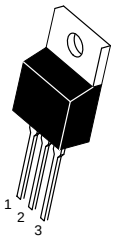
FEATURES

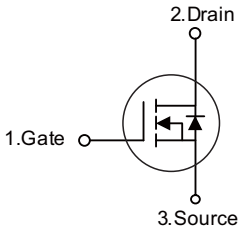
Repetitive Avalanche Rated

Fast Switching

Ease of Paralleling

Simple Drive Requirement





MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

MAXIMUM RATINGS(T_a=25℃ unless otherwise noted)

Symbol	Parameter	Value	Units
I_D	Continuous Drain Current, V_{GS} @ 10 V	18	A
P_D	Power Dissipation	2	W
	Linear Derating Factor	1.0	W/℃
V_{GS}	Gate-Souse Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy (note 1)	580	mJ
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	62.5	℃/W
T_J	Junction Temperature	150	℃
T_{STG}	Storage Temperature	-55~+150	℃

Electrical Characteristics (T_c=25℃,unless otherwise noted)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250μA	200			V
Gate-threshold voltage	$V_{(GS)th}$	V_{DS}=V_{GS}, I_D=250μA	2		4	
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS}=200V, V_{GS}=0V			25	μA
Drain-source on-resistance (note 2)	$R_{DS(on)}$	V_{GS}=10V, I_D=11A		0.125	0.18	Ω
Forward transconductance (note 2)	g_{fs}	V_{DS}=50V, I_D=11A	6.7			S
Diode forward voltage (note 2)	V_{SD}	I_S=18A, V_{GS}=0V			2	V
Input capacitance (note 3)	C_{iss}	V_{DS}=25V, V_{GS}=0V,f=1MHz		1300		pF
Output capacitance (note 3)	C_{oss}			400		
Reverse transfer capacitance (note 3)	C_{rss}			120		
Turn-on time(note 2,3)	$t_{d(on)}$	V_{DD}=100V,R_D=5.4Ω, I_D=18A, R_G=9.1Ω		14		ns
Rise time	t_r			51		
Turn-off time (note 2,3)	$t_{d(off)}$			45		
Fall time (note 2,3)	t_f			36		

Notes:

1. V_{DD}=50V,starting T_J=25℃，L=2.7mH,R_G=25Ω，I_{AS}=18A.
2. Pulse test: Pulse width≤300μs, duty cycle≤2%.
3. These parameters have no way to verify.

RATING AND CHARACTERISTIC CURVES

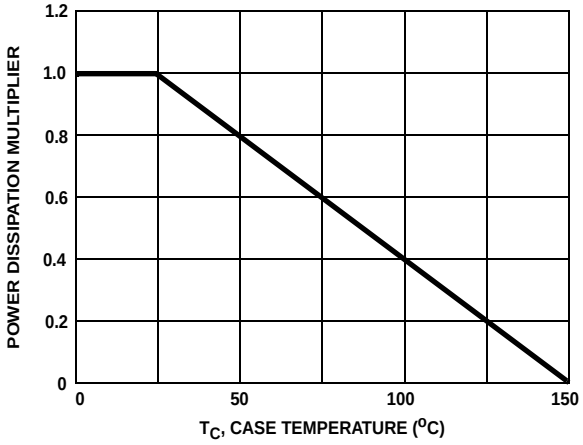


FIGURE 1. NORMALIZED POWER DISSIPATION vs CASE TEMPERATURE

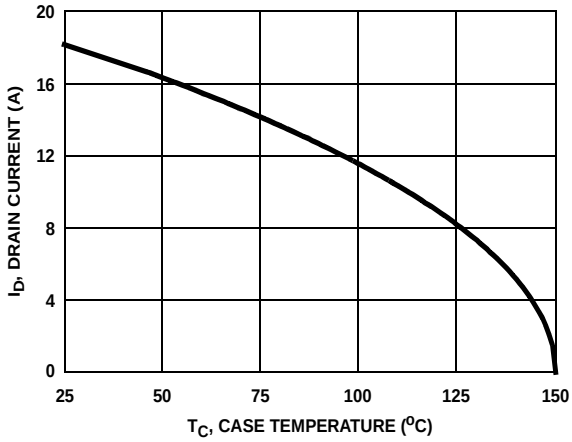


FIGURE 2. MAXIMUM CONTINUOUS DRAIN CURRENT vs CASE TEMPERATURE

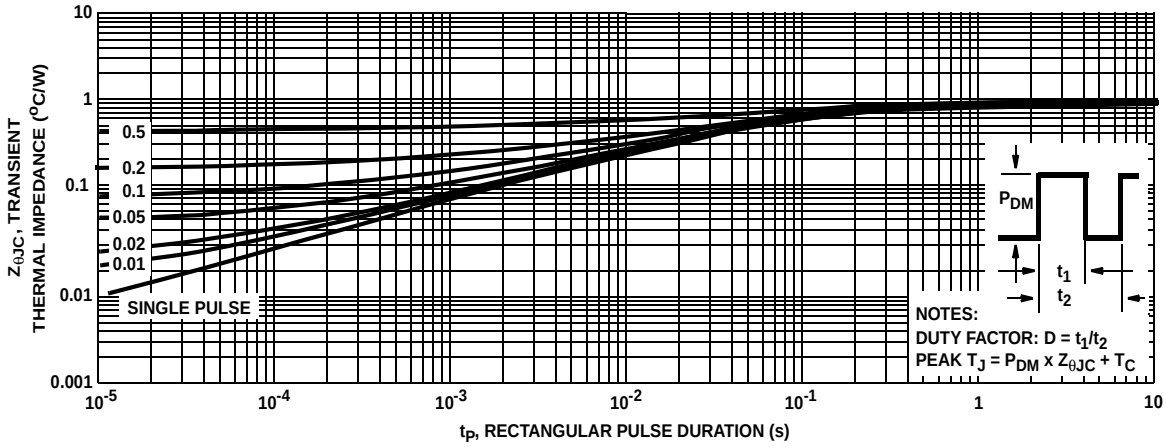


FIGURE 3. MAXIMUM TRANSIENT THERMAL IMPEDANCE

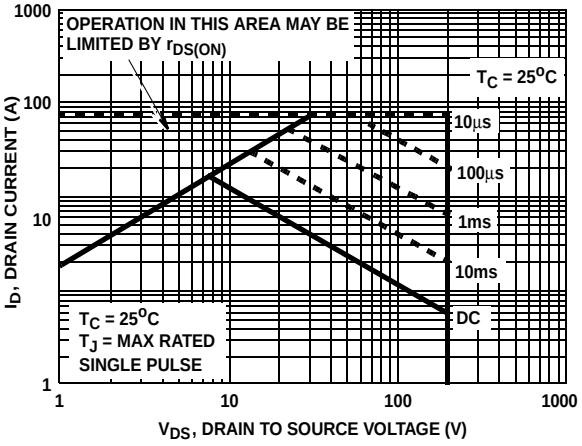


FIGURE 4. FORWARD BIAS SAFE OPERATING AREA

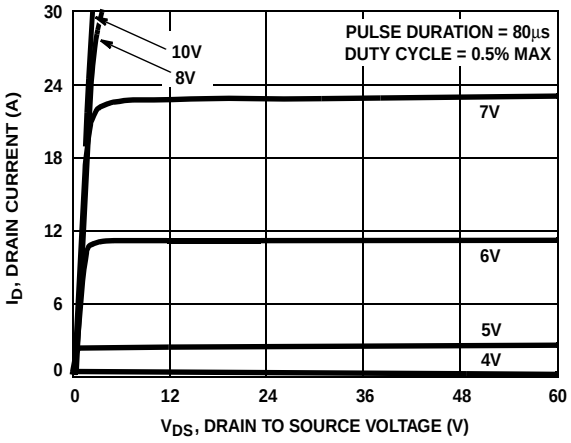


FIGURE 5. OUTPUT CHARACTERISTICS

RATING AND CHARACTERISTIC CURVES

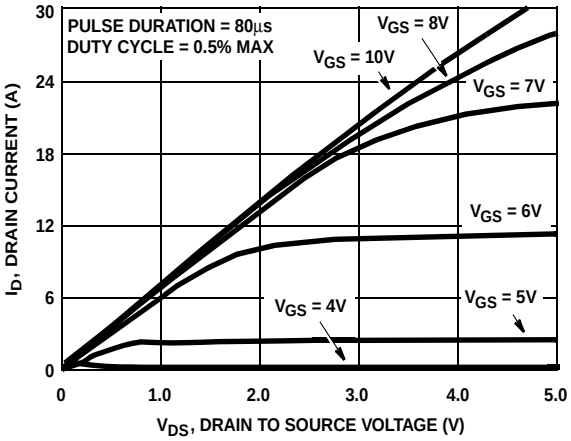


FIGURE 6. SATURATION CHARACTERISTICS

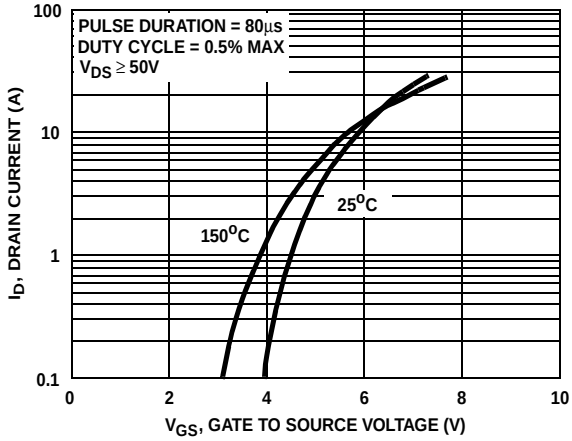


FIGURE 7. TRANSFER CHARACTERISTICS

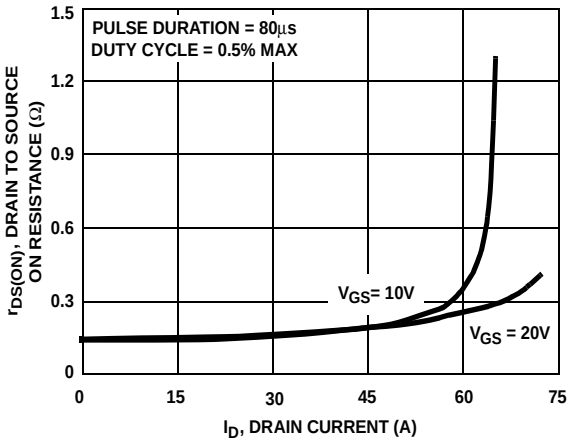


FIGURE 8. DRAIN TO SOURCE ON RESISTANCE vs GATE VOLTAGE AND DRAIN CURRENT

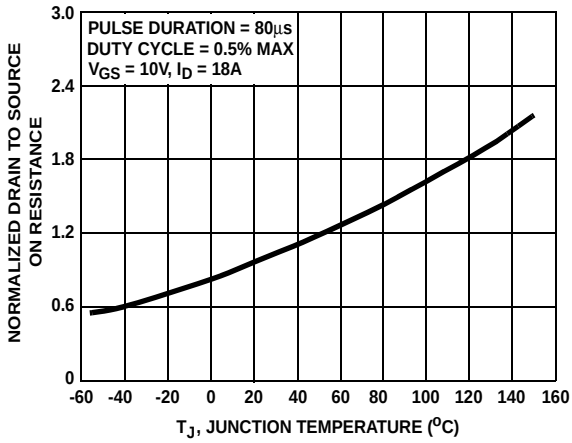


FIGURE 9. NORMALIZED DRAIN TO SOURCE ON RESISTANCE vs JUNCTION TEMPERATURE

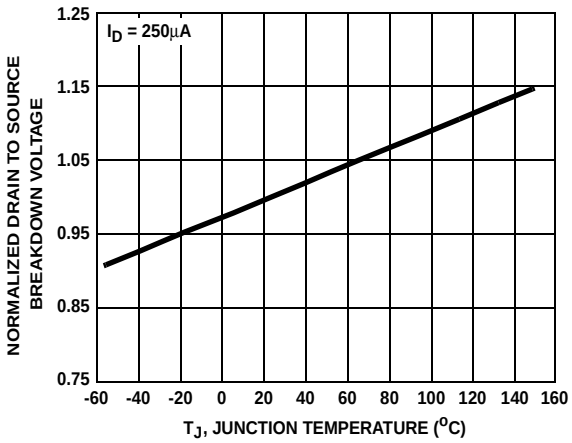


FIGURE 10. NORMALIZED DRAIN TO SOURCE BREAKDOWN VOLTAGE vs JUNCTION TEMPERATURE

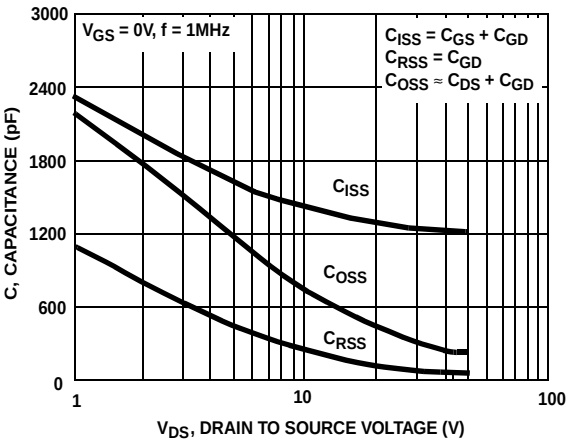


FIGURE 11. CAPACITANCE vs DRAIN TO SOURCE VOLTAGE

RATING AND CHARACTERISTIC CURVES

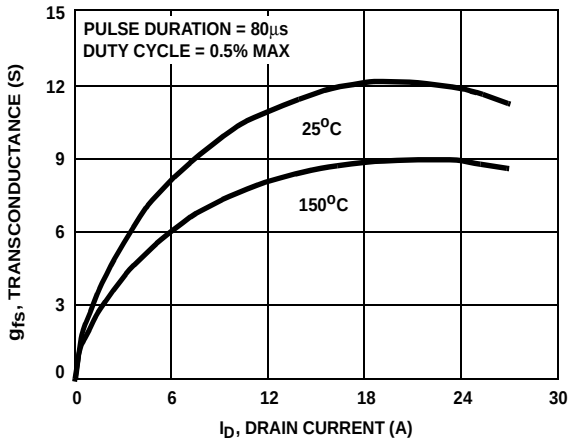


FIGURE 12. TRANSCONDUCTANCE vs DRAIN CURRENT

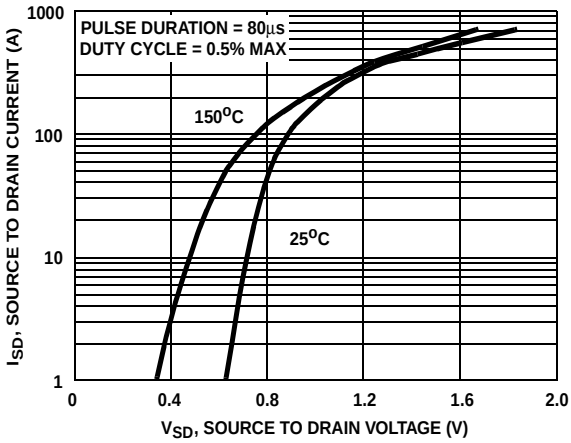


FIGURE 13. SOURCE TO DRAIN DIODE VOLTAGE

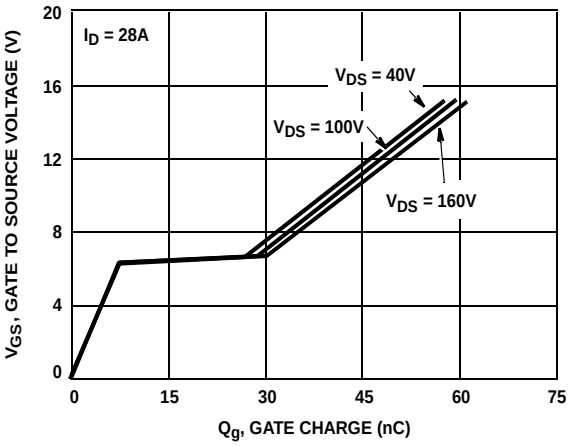
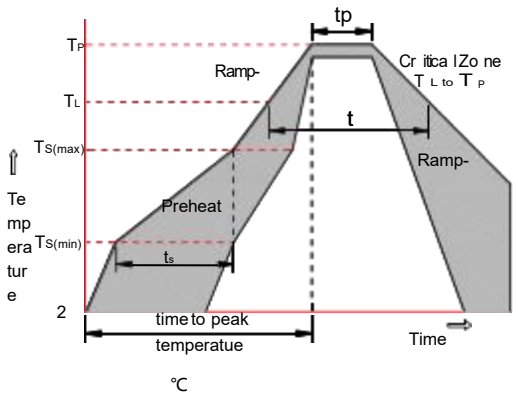


FIGURE 14. GATE TO SOURCE VOLTAGE vs GATE CHARGE

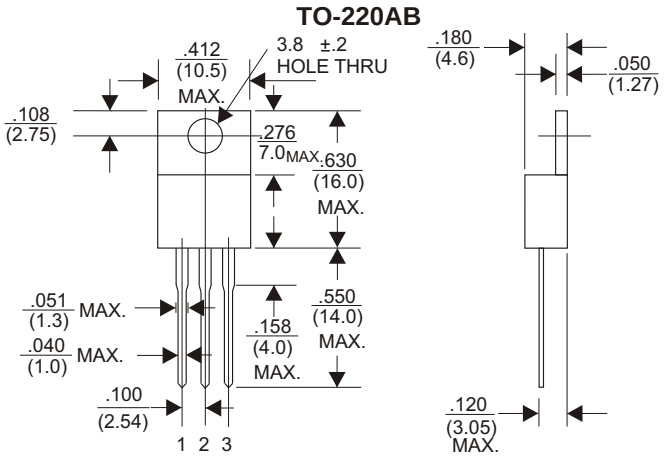
Soldering parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG5: Reflow condition



Package Dimensions & Suggested Pad Layout



Dimensions in inches and (millimeters)