

FEATURES

$V_{DS} = 200V$ $I_D = 9A$

$R_{DS(ON)} < 270m\Omega$ @ $V_{GS} = 10V$

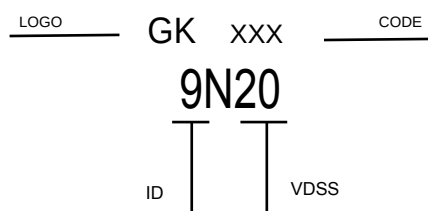
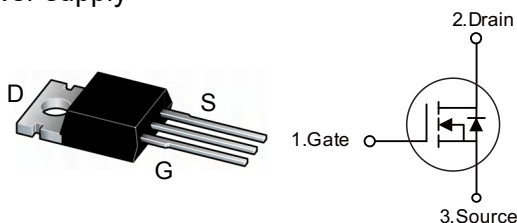
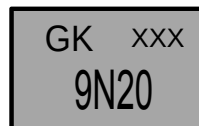
V_{DSS} 200V
 I_D 9 A
 $R_{DS(ON)}$ 216m Ω

APPLICATION

Battery protection

Load switch

Uninterruptible power supply



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

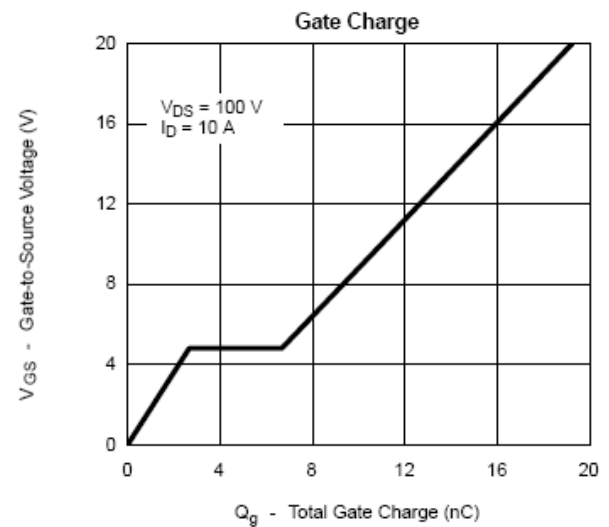
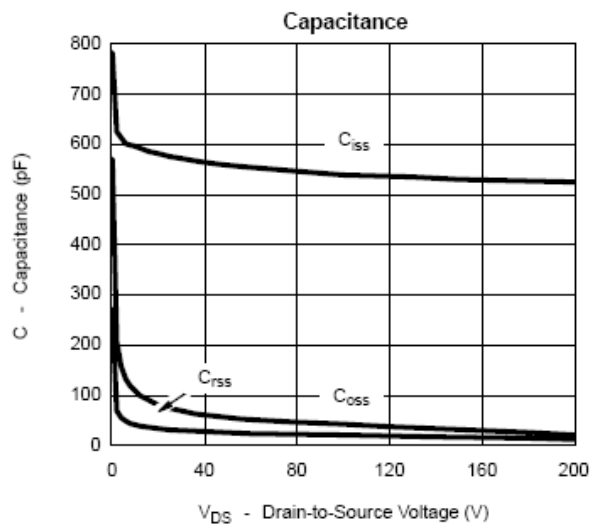
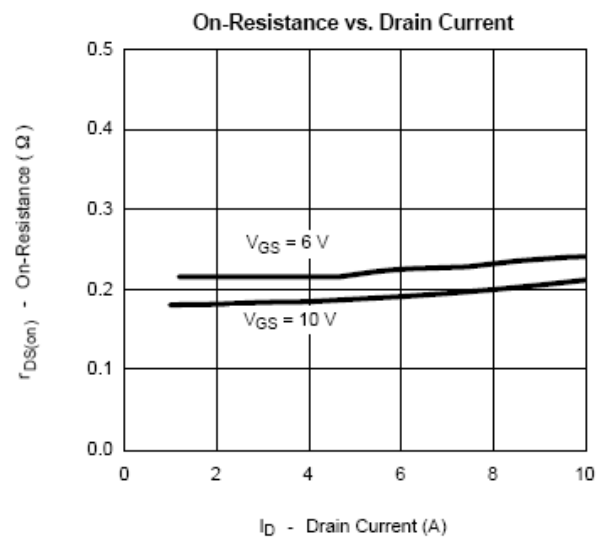
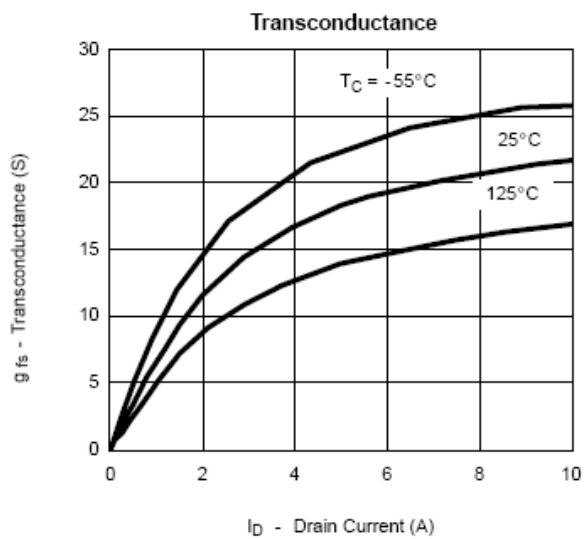
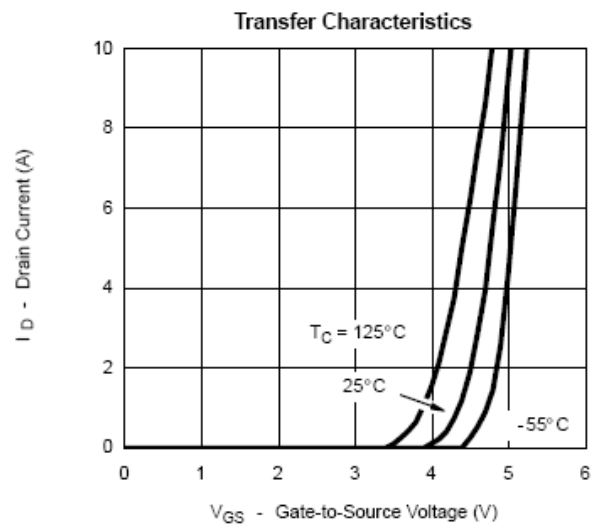
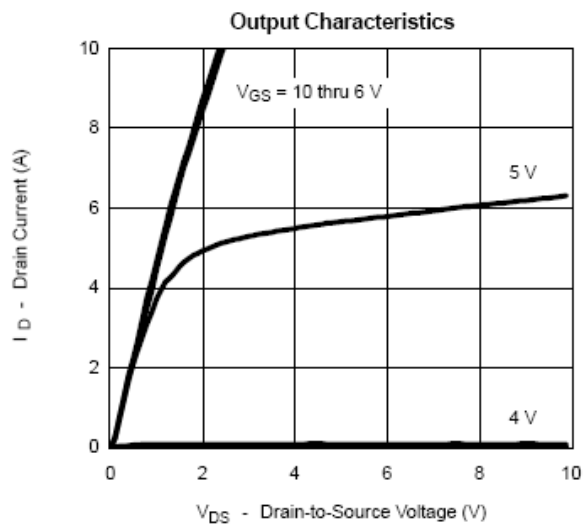
Maximum ratings ($T_a = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	9	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	5.2	A
I_{DM}	Pulsed Drain Current ²	10	A
EAS	Single Pulse Avalanche Energy ³	2.45	mJ
I_{AS}	Avalanche Current	7	A
$P_D @ T_C = 25^\circ\text{C}$	Total Power Dissipation ⁴	60	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State) ¹	40	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	2.5	$^\circ\text{C/W}$

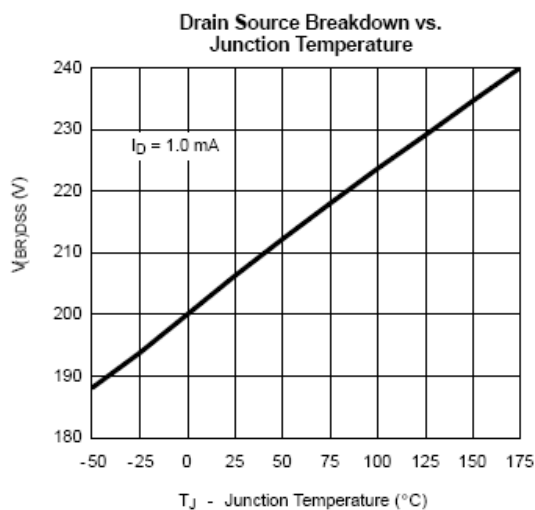
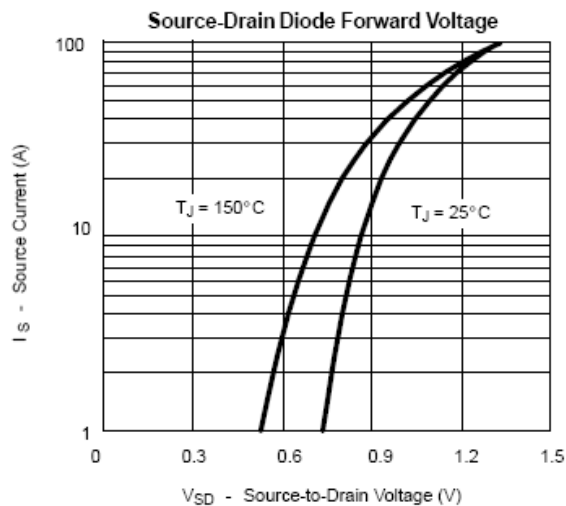
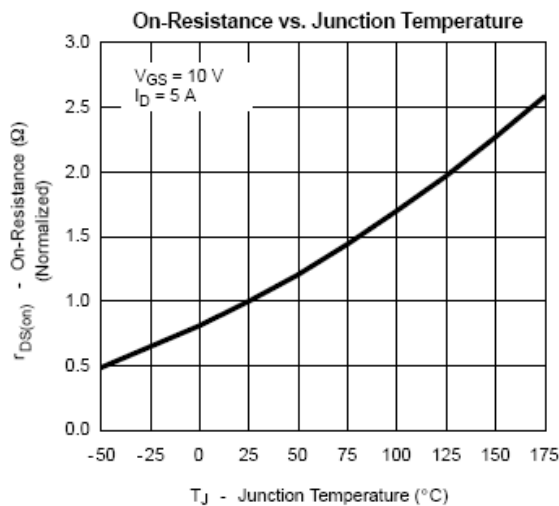
Electrical characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{DS}=0V, I_D=250\mu A$	200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=160V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=160V, V_{GS}=0V, T_J=125^\circ\text{C}$			50	
		$V_{DS}=160V, V_{GS}=0V, T_J=175^\circ\text{C}$			250	
Gate-body Leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
On-State Drain Currenta	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	10	-	-	A
Static drain-Source On-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$	-	0.216	0.270	Ω
		$V_{GS}=10V, I_D=5A, T_J=125^\circ\text{C}$	-	-	0.54	
		$V_{GS}=10V, I_D=5A, T_J=175^\circ\text{C}$	-	-	0.71	
		$V_{GS}=6V, I_D=5A$	-	0.24	0.3	
Forward Transconductance	g_{fs}	$V_{DS}=15V, I_D=5A$	-	15	-	S
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	-	580	-	pF
Output Capacitance	C_{oss}		-	75	-	
Reverse Transfer Capacitance	C_{rss}		-	30	-	
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=100V, I_D=10A$ $R_L=10\Omega, R_G=2.5\Omega, V_{GEN}=10V$	-	10	15	ns
Rise Time	t_R		-	35	55	
Turn-Off Delay Time	$t_{D(OFF)}$		-	25	40	
Fall Time	t_F		-	40	60	
Total Gate Charge	Q_g	$V_{DS}=100V, V_{GS}=10V$ $I_D=10A$	-	11	70	nC
Gate-source Charge	Q_{gs}		-	2.7	-	nC
Gate-drain Charge	Q_{gd}		-	4	-	nC
Reverse Recovery Time	T_{rr}	$I_F=10A$ $dI_F/dt=100A/\mu s$	-	100	150	ns
Reverse Recovery Charge	Q_{rr}		-	0.25	0.6	μC
Reverse Recovery Current	I_{RM}		-	5	8	A
Continuous Current	I_S		-	-	9	A
Pulsed Current	I_{SM}				10	A
Forward Voltagea	V_{SD}	$I_F=10A, V_{GS}=0V$		0.9	1.5	V

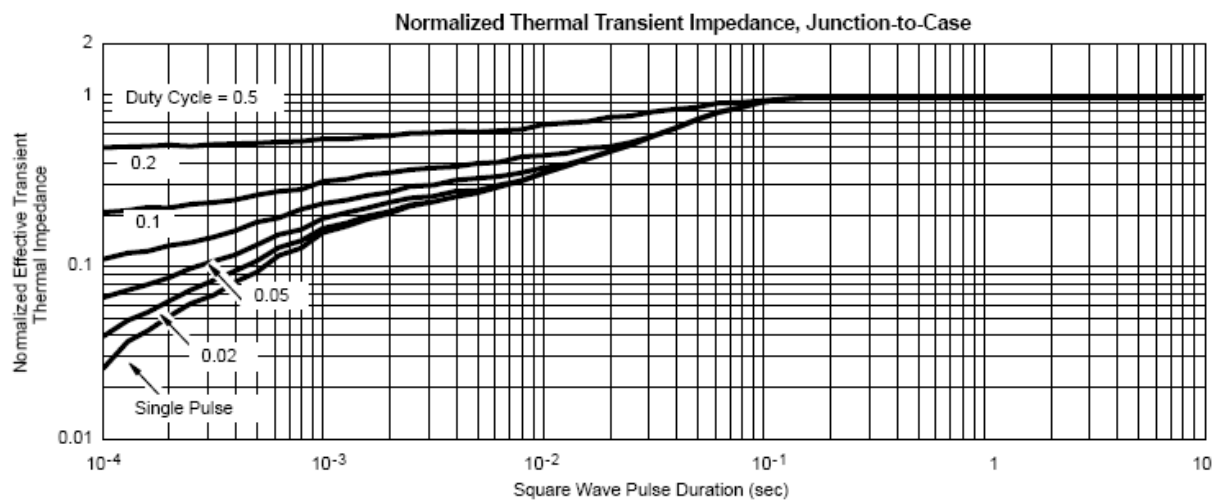
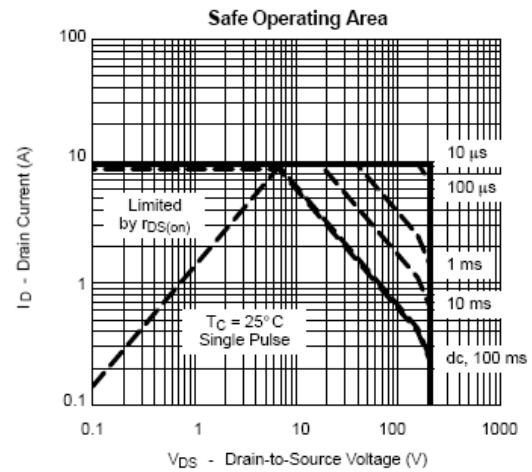
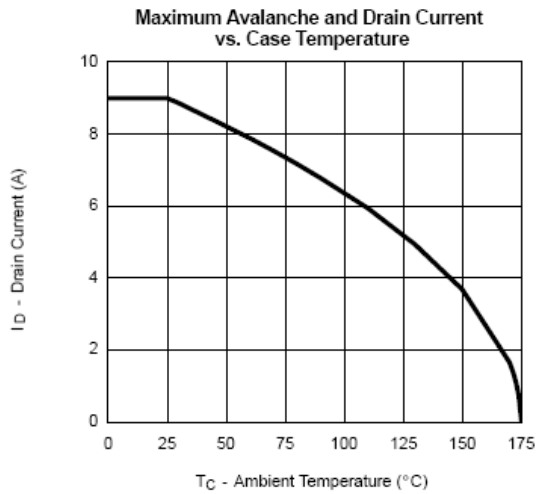
RATING AND CHARACTERISTIC CURVES



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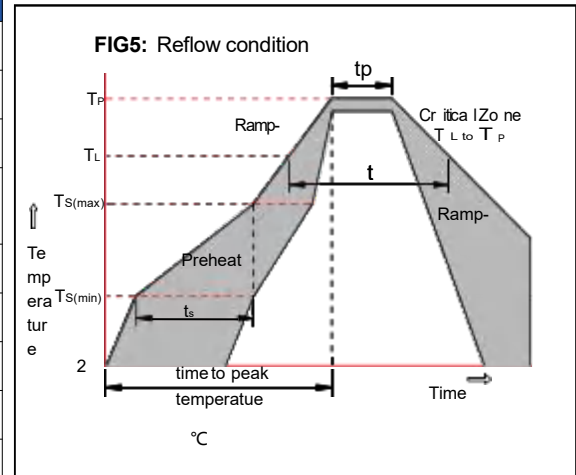


RATING AND CHARACTERISTIC CURVES



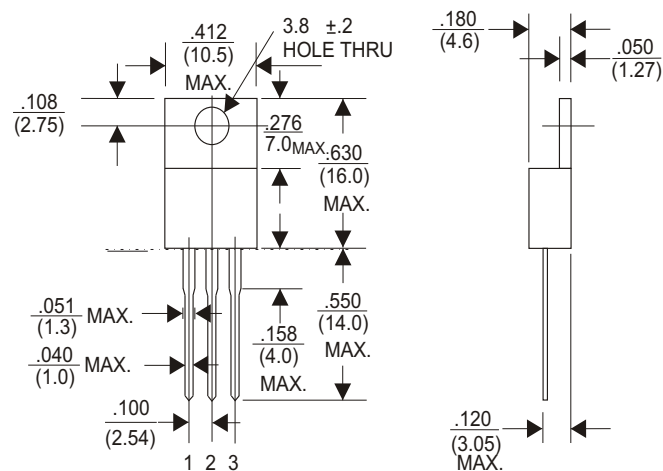
Soldering parameters

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



Package Dimensions & Suggested Pad Layout

TO-220



Dimensions in inches and (millimeters)