



IRF9620/9621/9622/9623

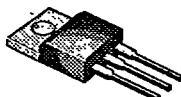
P-Channel Enhancement Mode Transistors

T-39-19

PRODUCT SUMMARY

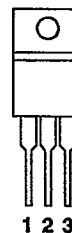
PART NUMBER	$V_{(BR)DSS}$ (V)	$r_{DS(ON)}$ (Ω)	I_D (A)
IRF9620	200	1.5	3.5
IRF9621	150	1.5	3.5
IRF9622	200	2.4	3.0
IRF9623	150	2.4	3.0

TO-220AB



- 1 GATE
2 DRAIN (Connected to TAB)
3 SOURCE

TOP VIEW



1 2 3

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)¹

PARAMETERS/TEST CONDITIONS	SYMBOL	IRF				UNITS
		9620	9621	9622	9623	
Gate-Source Voltage	V_{GS}	± 20	± 20	± 20	± 20	V
Continuous Drain Current	I_D	3.5	3.5	3.0	3.0	A
		2.0	2.0	1.5	1.5	
Pulsed Drain Current ²	I_{DM}	14	14	12	12	
Avalanche Current (See Figure 9)	I_{AR}	3.5	3.5	3.5	3.5	
Repetitive Avalanche Energy ³	E_{AR}	0.6	0.6	0.6	0.6	mJ
Power Dissipation	P_D	40	40	40	40	W
		16	16	16	16	
Operating Junction & Storage Temperature Range	T_J, T_{stg}	-55 to 150				$^\circ\text{C}$
Lead Temperature ($1/16"$ from case for 10 sec.)	T_L	300				

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THERMAL RESISTANCE RATINGS¹

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	R_{thJC}		3.12	K/W
Junction-to-Ambient	R_{thJA}		80	
Case-to-Sink	R_{thCS}	1.0		

¹Negative signs for current and voltage ratings have been omitted for the sake of clarity.

²Pulse width limited by maximum junction temperature (refer to transient thermal impedance data, Figure 11).

³Duty cycle $\leq 1\%$.

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ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ Unless Otherwise Noted)
P-Channel Device - Negative Signs Have Been Omitted for Clarity

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PARAMETER		SYMBOL	TEST CONDITIONS	TYP	LIMITS		UNIT
					MIN	MAX	
STATIC							
Drain-Source Breakdown Voltage	IRF9620, 9622 IRF9621, 9623	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$		200 150		V
Gate Threshold Voltage		$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$		2.0	4.0	
Gate-Body Leakage		I_{GBSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 500	nA
Zero Gate Voltage Drain Current		I_{DSS}	$V_{DS} = V_{(BR)DSS}, V_{GS} = 0\text{ V}$			250	μA
			$V_{DS} = 0.8 \times V_{(BR)DSS}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			1000	
On-State Drain Current ¹	IRF9620, 9621 IRF9622, 9623	$I_{D(ON)}$	$V_{DS} = 10\text{ V}, V_{GS} = 10\text{ V}$		3.5 3.0		A
Drain-Source On-State Resistance ¹	IRF9620, 9621 IRF9622, 9623	$r_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 1.5\text{ A}$	1.0 1.5		1.5 2.4	Ω
	$V_{GS} = 10\text{ V}, I_D = 1.5\text{ A}$ $T_J = 125^\circ\text{C}$		1.75 2.60		2.7 4.3		
Forward Transconductance ¹		g_{fs}	$V_{DS} = 15\text{ V}, I_D = 1.5\text{ A}$	1.4	1.0		S
DYNAMIC							
Input Capacitance		C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	310		400	pF
Output Capacitance		C_{oss}		110		125	
Reverse Transfer Capacitance		C_{rss}		40		45	
Total Gate Charge ²		Q_g	$V_{DS} = 0.8 \times V_{(BR)DSS}, V_{GS} = 10\text{ V}, I_D = 4\text{ A}$	17		22	nC
Gate-Source Charge ²		Q_{gs}		1.8			
Gate-Drain Charge ²		Q_{gd}		8.6			
Turn-On Delay Time ²		$t_{d(on)}$	$V_{DD} = 100\text{ V}, R_L = 25\text{ }\Omega$ $I_D \approx 1.5\text{ A}, V_{GEN} = 10\text{ V}, R_G = 25\text{ }\Omega$	10		40	ns
Rise Time ²		t_r		23		50	
Turn-Off Delay Time ²		$t_{d(off)}$		45		50	
Fall Time ²		t_f		31		40	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_C = 25^\circ\text{C}$)							
Continuous Current	IRF9620, 9621 IRF9622, 9623	I_S				3.5 3.0	A
Pulsed Current ³	IRF9620, 9621 IRF9622, 9623	I_{SM}				14 12	
Forward Voltage ¹	IRF9620, 9621 IRF9622, 9623	V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$			7.0 6.8	V
Reverse Recovery Time		t_{rr}	$I_F = I_S, dI_F/dt = 100\text{ A}/\mu\text{s}$	105			ns
Reverse Recovery Charge		Q_{rr}		0.23			μC

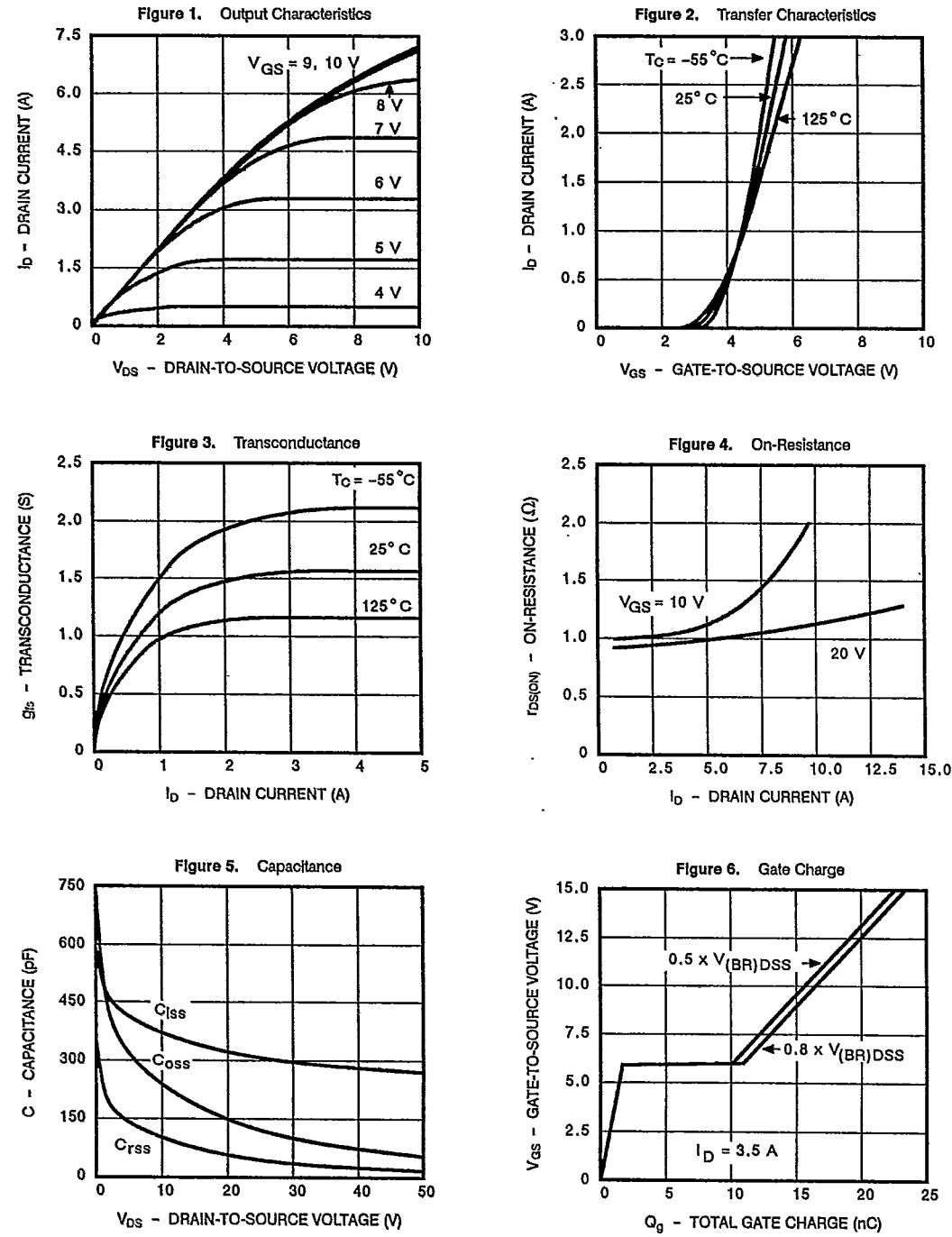
¹Pulse test: Pulse Width $\leq 300\text{ }\mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

³Pulse width limited by maximum junction temperature (refer to transient thermal impedance data, Figure 11).

TYPICAL CHARACTERISTICS (25°C Unless Otherwise Specified)

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TYPICAL CHARACTERISTICS (Cont'd)

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Figure 7. On-Resistance vs. Junction Temperature

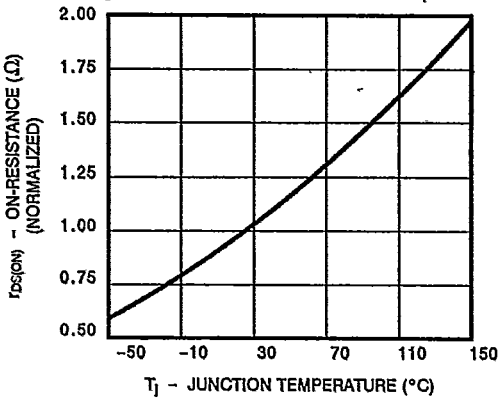
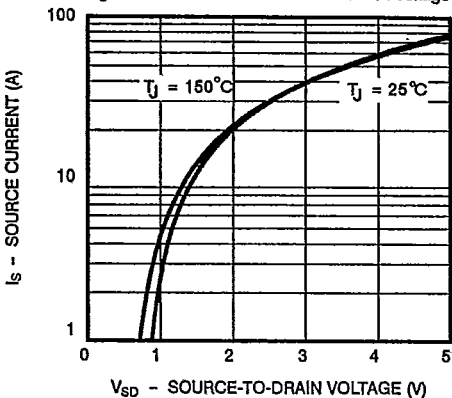


Figure 8. Source-Drain Diode Forward Voltage



THERMAL RATINGS

Figure 9. Maximum Avalanche and Drain Current vs. Case Temperature

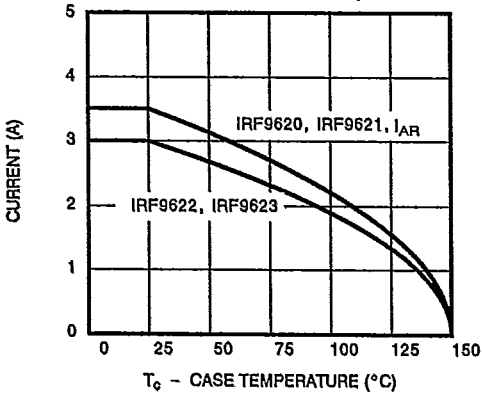


Figure 10. Safe Operating Area

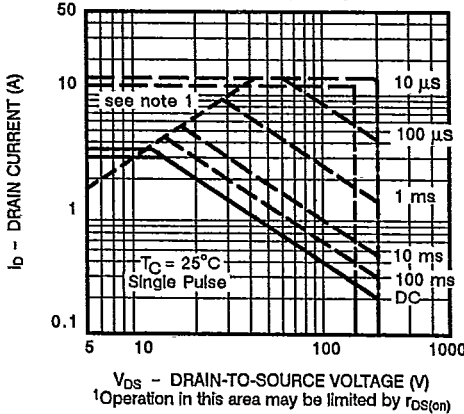


Figure 11. Normalized Effective Transient Thermal Impedance, Junction-to-Case

