

electrical characteristics ($T_C = 25^\circ\text{C}$) (unless otherwise specified)

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT
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off characteristics

Drain-Source Breakdown Voltage ($V_{GS} = 0V$, $I_D = 250\mu A$)	IRF642 IRF643	BV_{DSS}	200 150	— —	Volts
Zero Gate Voltage Drain Current ($V_{DS} = \text{Max Rating}$, $V_{GS} = 0V$, $T_C = 25^\circ\text{C}$) ($V_{DS} = \text{Max Rating}$, $\times 0.8$, $V_{GS} = 0V$, $T_C = 125^\circ\text{C}$)		I_{DSS}	— —	— 250 1000	μA
Gate-Source Leakage Current ($V_{GS} = \pm 20V$)		I_{GSS}	—	—	± 500 nA

on characteristics*

Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250\mu A$)	$T_C = 25^\circ\text{C}$	$V_{GS(TH)}$	2.0	—	4.0	Volts
On-State Drain Current ($V_{GS} = 10V$, $V_{DS} = 10V$)		$I_{D(ON)}$	16	—	—	A
Static Drain-Source On-State Resistance ($V_{GS} = 10V$, $I_D = 10A$)		$R_{DS(ON)}$	—	0.18	0.22	Ohms
Forward Transconductance ($V_{DS} = 10V$, $I_D = 10A$)		g_{fs}	4.8	6.0	—	mhos

dynamic characteristics

Input Capacitance	$V_{GS} = 10V$	C_{iss}	—	1400	1600	pF
Output Capacitance	$V_{DS} = 25V$	C_{oss}	—	310	750	pF
Reverse Transfer Capacitance	$f = 1\text{ MHz}$	C_{rss}	—	65	300	pF

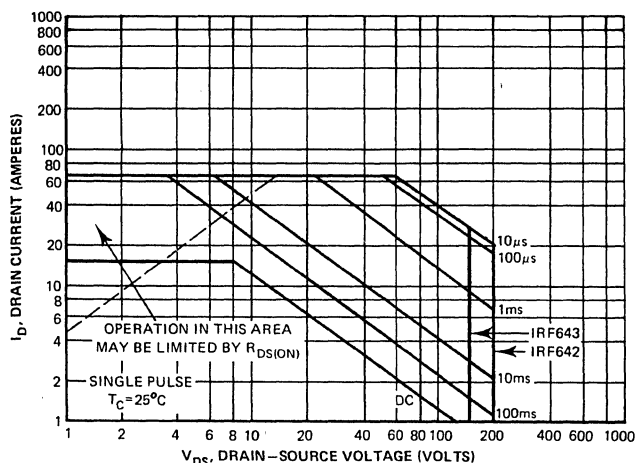
switching characteristics*

Turn-on Delay Time	$V_{DS} = 90V$	$t_{d(on)}$	—	20	—	ns
Rise Time	$I_D = 0A$, $V_{GS} = 15V$	t_r	—	40	—	ns
Turn-off Delay Time	$R_{GEN} = 50\Omega$, $R_{GS} = 12.5\Omega$	$t_{d(off)}$	—	60	—	ns
Fall Time	($R_{GS} \text{ (EQUIV.)} = 10\Omega$)	t_f	—	30	—	ns

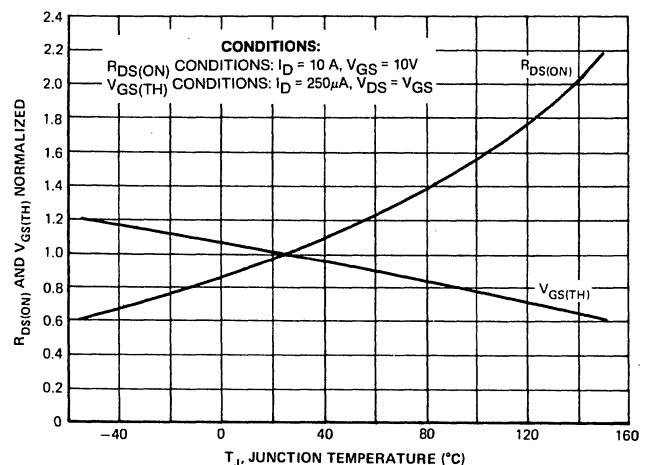
source-drain diode ratings and characteristics*

Continuous Source Current	I_S	—	—	16	A
Pulsed Source Current	I_{SM}	—	—	64	A
Diode Forward Voltage ($T_C = 25^\circ\text{C}$, $V_{GS} = 10V$, $I_S = 16A$)	V_{SD}	—	1.0	1.9	Volts
Reverse Recovery Time ($I_S = 18A$, $dI_S/dt = 100A/\mu\text{sec}$, $T_C = 125^\circ\text{C}$)	t_{rr} Q_{RR}	—	330 3.5	—	ns μC

*Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$



MAXIMUM SAFE OPERATING AREA



TYPICAL NORMALIZED $R_{DS(ON)}$ AND $V_{GS(TH)}$ VS. TEMP.