

IXGH20N50, 60
IXGM20N50, 60
 20 AMPS, 500–600 VOLTS
MAXIMUM RATINGS

Parameter	Sym.	IXGH20N50 IXGM20N50	IXGH20N60 IXGM20N60	Unit
Drain-Source Voltage (1)	V_{DS}	500	600	V_{dc}
Drain-Gate Voltage ($R_{GS} = 1.0M\Omega$) (1)	V_{DGR}	500	600	V_{dc}
Gate-Source Voltage	V_{GS}	± 30	± 30	V_{dc}
Drain Current Continuous $T_C = 25^\circ C$ $T_C = 90^\circ C$	I_D	40 20	40 20	A_{dc}
Drain Current Peak (3)	I_{DM}	70	70	A_{dc}
Total Power Dissipation @ $25^\circ C$	P_D	150		W
Power Dissipation Derating $> 25^\circ C$		1.25		W/ $^\circ C$
Operating and Storage Junction Temperature	T_J & T_{stg}	-65 to $+150$		$^\circ C$
Thermal Resistance	R_{thJC}	0.8		$^\circ C/W$

ELECTRICAL CHARACTERISTICS $T_C = 25^\circ C$ unless otherwise specified

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS} Drain-Source Breakdown Voltage	20N50, 50A	500	—	—	V	$V_{GS} = 0V$ $I_D = 250\mu A$
	20N60, 60A	600	—	—	V	
$V_{GS(th)}$ Gate Threshold Voltage	ALL	2.5	—	5.0	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$
I_{GSS} Gate-Source Leakage	ALL	—	—	100	nA	$V_{GS} = \pm 30V$
I_{DSS} Zero Gate Voltage Drain Current	ALL	—	—	200	μA	$V_{DS} = \text{Max. Rating} \times 0.8$, $V_{GS} = 0V$
		—	—	1000	μA	$V_{DS} = \text{Max. Rating} \times 0.8$, $V_{GS} = 0V$, $T_C = 125^\circ C$
$V_{DS(ON)}$ Drain-Source On Voltage	20N50, 60	—	—	2.5	V	$V_{GS} = 15V$, $I_D = 20A$
	20N50A, 60A	—	—	3.0	V	
G_{fs} Forward Transconductance (2)	ALL	6.0	—	—	S	$V_{DS} = 10V$, $I_D = 10A$
C_{iss} Input Capacitance	ALL	—	—	2000	pF	$V_{GS} = 0V$, $V_{DS} = 25V$, $f = 1.0$ MHz
C_{oss} Output Capacitance	ALL	—	—	200	pF	
C_{rss} Reverse Transfer Capacitance	ALL	—	—	40	pF	

SWITCHING CHARACTERISTICS**RESISTIVE LOAD**

$t_{d(on)}$ Turn-On Delay Time	ALL	—	—	100	ns	Resistive Load. $T_J = 125^\circ C$ $I_D = 20A$. $V_{DS} = \text{Rated } V_{DSS} \times 0.8$ $V_{GS} = 15V$ $R_{GS} = 100\Omega$
t_r Current Rise Time	ALL	—	—	200	ns	
$t_{d(off)}$ Turn-Off Delay Time	ALL	—	—	500	ns	
t_f Current Fall Time	20N50, 60	—	—	1.5	μs	
	20N50A, 60A	—	—	0.5	μs	

INDUCTIVE LOAD

$t_{d(off)}$ Turn-Off Delay Time	ALL	—	—	500	ns	Inductive Load. $T_J = 125^\circ C$ $L = 100\mu H$. $I_D = 20A$ $V_{DS}(\text{Clamp}) = \text{Rated } V_{DSS} \times 0.8$ $V_{GS} = 15V$. $R_{GS} = 100\Omega$
t_f Current Fall Time	20N50, 60	—	—	2.0	μs	
	20N50A, 60A	—	—	0.6	μs	

(1) $T_J = 25^\circ C$ to $150^\circ C$ (2) Pulse Test: Pulse width $\leq 300ms$, duty cycle $\leq 2\%$

(3) Repetitive Rating: Pulse width limited by max junction temperature