



**IXTH10N60, IXTM10N60**

10 AMPS, 600 V, 0.55Ω/0.7Ω

T-39-15

**MAXIMUM RATINGS**

Parameter	Sym.	IXTH10N60 IXTM10N60	Unit
Drain-Source Voltage (1)	$V_{DSS}$	600	$V_{dc}$
Drain-Gate Voltage ( $R_{GS}=1.0\text{ M}\Omega$ ) (1)	$V_{DGR}$	600	$V_{dc}$
Gate-Source Voltage Continuous	$V_{GS}$	$\pm 20$	$V_{dc}$
Gate-Source Voltage Transient	$V_{GSM}$	$\pm 30$	V
Drain Current Continuous ( $T_c=25^\circ\text{C}$ )	$I_D$	10	$A_{dc}$
Drain Current Pulsed (3)	$I_{DM}$	40	A
Total Power Dissipation	$P_D$ IXTH/IXTM	180/150	W
Power Dissipation Derating $>25^\circ\text{C}$	IXTH/IXTM	1.4/1.2	W/ $^\circ\text{C}$
Operating and Storage Temperature	$T_J$ & $T_{slg}$	- 65 to + 150	$^\circ\text{C}$
Max. Lead Temp. for Soldering	$T_L$	300 (1.6mm from case for 10 sec.)	$^\circ\text{C}$


**ELECTRICAL CHARACTERISTICS**  $T_c=25^\circ\text{C}$  unless otherwise specified

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
$BV_{DSS}$ Drain-Source Breakdown Voltage	10N60, 60A	600	-	-	V	$V_{GS}=0V, I_D=250\mu A$
$V_{GS(th)}$ Gate Threshold Voltage	ALL	2.0	-	4.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
$I_{GSS}$ Gate-Source Leakage Forward	ALL	-	-	100	nA	$V_{GS}=20V$
$I_{GSS}$ Gate-Source Leakage Reverse	ALL	-	-	100	nA	$V_{GS}=-20V$
$I_{DSS}$ Zero Gate Voltage Drain Current	ALL	-	-	200	$\mu A$	$V_{DS}=\text{Max. Rating}\times 0.8, V_{GS}=0V$
		-	-	1000	$\mu A$	$V_{DS}=\text{Max. Rating}\times 0.8, V_{GS}=0V, T_c=125^\circ\text{C}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance (2)	10N60A	-	-	0.55	$\Omega$	$V_{GS}=10V, I_D=5.0A$
	10N60	-	-	0.7	$\Omega$	
$G_{fs}$ Forward Transconductance (2)	ALL	5.0	7.0	-	S	$V_{DS}\geq 15V, I_D=5.0A$
$C_{iss}$ Input Capacitance	ALL	-	2700	-	pF	$V_{GS}=0V, V_{DS}=25V, f=1.0\text{ MHz}$
$C_{oss}$ Output Capacitance	ALL	-	270	-	pF	
$C_{rss}$ Reverse Transfer Capacitance	ALL	-	65	-	pF	
$t_{d(on)}$ Turn-On Delay Time	ALL	-	20	35	ns	$V_{DS}=0.5 BV_{DSS}, I_D=5.0A, Z_o=5\Omega$  (MOSFET switching times are essentially independent of operating temperature. See Fig. 3, page 22 for test circuit.)
$t_r$ Rise Time	ALL	-	25	45	ns	
$t_{d(off)}$ Turn-Off Delay Time	ALL	-	70	100	ns	
$t_f$ Fall Time	ALL	-	30	50	ns	
$Q_g$ Total Gate Charge	ALL	-	-	120	nC	
$Q_{gs}$ Gate-Source Charge	ALL	-	-	40	nC	$V_{GS}=10V, I_D=5.0A, V_{DS}=0.8\text{ Max. Rating.}$ (Gate charge is essentially independent of operating temperature. See Fig. 4, page 22 for test circuit.)
$Q_{gd}$ Gate-Drain ("Miller") Charge	ALL	-	-	60	nC	
$W_{DSR}$ Unclamped Drain-to-Source Avalanche Energy	10N60R, 60AR	800	-	-	mJ	
	3N90R, 90AR					

**THERMAL RESISTANCE**

$R_{thJC}$ Junction-to-Case	IXTM	-	-	0.83	$^\circ\text{C/W}$	
	IXTH	-	-	0.7	$^\circ\text{C/W}$	
$R_{thJA}$ Junction-to-Ambient TO-204	IXTM	-	-	30.0	$^\circ\text{C/W}$	Free Air Operation
$R_{thJA}$ Junction-to-Ambient TO-247	IXTH	-	-	60.0	$^\circ\text{C/W}$	Free Air Operation

**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS**

$I_S$ Continuous Source Current (Body Diode)	ALL	-	-	10.0	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier. 
$I_{SM}$ Pulse Source Current (Body Diode) (1)	ALL	-	-	40.0	A	
$V_{SD}$ Diode Forward Voltage (2)	ALL	-	-	1.5	V	$T_c=25^\circ\text{C}, I_f=10.0A, V_{GS}=0V$
$t_{rr}$ Reverse Recovery Time	ALL	-	600	-	ns	$I_f=10.0A, di/dt=100A/\mu s$

(1)  $T_J=25^\circ\text{C}$  to  $150^\circ\text{C}$

(2) Pulse test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$

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