



IXTH15N45A, IXTH15N50A, IXTM15N45A, IXTM15N50A

15 AMPS, 450-500 V, 0.4Ω

T-39-15

MAXIMUM RATINGS

Parameter	Sym.	IXTH15N45A IXTM15N45A	IXTH15N50A IXTM15N50A	Unit
Drain-Source Voltage (1)	V_{DSS}	450	500	V_{dc}
Drain-Gate Voltage ($R_{GS}=1.0\text{ M}\Omega$) (1)	V_{DGR}	450	500	V_{dc}
Gate-Source Voltage Continuous	V_{GS}		± 20	V_{dc}
Gate-Source Voltage Transient	V_{GSM}		± 30	V
Drain Current Continuous ($T_C=25^\circ\text{C}$)	I_D	15		A_{dc}
Drain Current Pulsed (3)	I_{DM}	60		A
Total Power Dissipation	P_D	200		W
Power Dissipation Derating $>25^\circ\text{C}$		1.67		W/ $^\circ\text{C}$
Operating and Storage Temperature	T_J & T_{stg}	- 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	15N45A	450	-	-	V	$V_{GS}=0V$
	15N50A	500	-	-	V	$I_D=250\mu A$
$V_{GS(th)}$ Gate Threshold Voltage	ALL	2.0	-	4.0	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	μA	$V_{DS}=\text{Max. Rating}\times 0.8, V_{GS}=0V$
		-	-	1000	μA	$V_{DS}=\text{Max. Rating}\times 0.8, V_{GS}=0V, T_C=125^\circ\text{C}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance (2)	15N45A,50A	-	-	0.4	Ω	$V_{GS}=10V, I_D=7.5A$
G_{fs} Forward Transconductance (2)	ALL	7.5	9.0	-	S	$V_{DS}\geq 15V, I_D=7.5A$
C_{iss} Input Capacitance	ALL	-	2700	-	pF	$V_{GS}=0V, V_{DS}=25V, f=1.0\text{ MHz}$
C_{oss} Output Capacitance	ALL	-	290	-	pF	
C_{rss} Reverse Transfer Capacitance	ALL	-	80	-	pF	
$t_{d(on)}$ Turn-On Delay Time	ALL	-	20	25	ns	$V_{DS}=0.5 BV_{DSS}, I_D=7.5A, Z_\theta=5\Omega$ (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	80	ns	
t_f Fall Time	ALL	-	30	50	ns	
Q_g Total Gate Charge	ALL	-	-	120	nC	$V_{GS}=10V, I_D=15.0A, V_{DS}=0.8\text{ Max. Rating.}$ (Gate charge is essentially independent of operating temperature. See Fig. 4, page 22 for test circuit.)
Q_{gs} Gate-Source Charge	ALL	-	-	40	nC	
Q_{gd} Gate-Drain ("Miller") Charge	ALL	-	-	60	nC	
W_{DSR} Unclamped Drain-to-Source Avalanche Energy	15N45AR	800	-	-	mJ	See Fig. 5, page 22 for test circuit.
	15N50AR					

THERMAL RESISTANCE

Parameter	Type	Min.	Typ.	Max.	Units	Notes
$R_{th(jc)}$ Junction-to-Case	ALL	-	-	0.6	$^\circ\text{C/W}$	
$R_{th(ja)}$ Junction-to-Ambient TO-204	IXTM	-	-	30.0	$^\circ\text{C/W}$	Free Air Operation
$R_{th(ja)}$ Junction-to-Ambient TO-247	IXTH	-	-	60.0	$^\circ\text{C/W}$	Free Air Operation

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
I_S Continuous Source Current (Body Diode)	ALL	-	-	15.0	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier. 
I_{SM} Pulse Source Current (Body Diode) (1)	ALL	-	-	60.0	A	
V_{SD} Diode Forward Voltage (2)	ALL	-	-	1.5	V	$T_C=25^\circ\text{C}, I_f=15.0A, V_{GS}=0V$
t_{rr} Reverse Recovery Time	ALL	-	600	-	ns	$I_f=15.0A, di/dt=100A/\mu s$

(1) $T_J=25^\circ\text{C}$ to 150°C

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

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