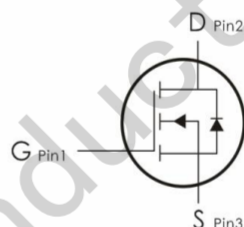
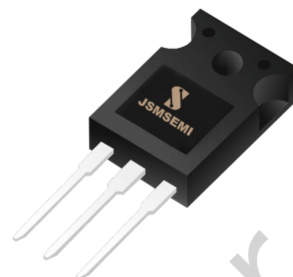


FEATURES

- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)



Device Marking and Package Information		
Device	Package	Marking
IXTQ60N20T	TO-247	IXTQ60N20T

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted			
Parameter	Symbol	Value	Unit
		TO-247	
Drain-Source Voltage	V_{DS}	220	V
Continuous Drain Current	I_D	60	A
Pulsed Drain Current (note2)	I_{DM}	270	A
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulse Avalanche Energy (note2)	E_{AS}	780	mJ
Avalanche Current (note1)	I_{AR}	39.5	V/ns
Repetitive Avalanche Energy (note1)	E_{AR}	468	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	500	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

Thermal Resistance			
Parameter	Symbol	Value	Unit
		TO-247	
Thermal Resistance, Junction-to-Case	R_{thJC}	0.5	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	R_{thJA}	45	

Specifications T _J = 25°C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	220	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 220V, V _{GS} = 0V, T _J = 25°C	--	--	1	μA
Gate-Source Leakage	I _{GSS}	V _{GS} = +20V, V _{DS} =0V	--	--	100	nA
		V _{GS} =-20V, V _{DS} =0V	--	--	-100	
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2.0	--	4.0	V
Drain-Source On-Resistance (Note3)	R _{DS(on)}	V _{GS} = 10V, I _D = 25A	--	27	45	mΩ
Dynamic						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz	--	3538	--	pF
Output Capacitance	C _{oss}		--	657	--	
Reverse Transfer Capacitance	C _{rss}		--	280	--	
Total Gate Charge	Q _g	V _{DD} =160V, I _D = 25A, V _{GS} = 0 to 10V	--	244	--	nC
Gate-Source Charge	Q _{gs}		--	16	--	
Gate-Drain Charge	Q _{gd}		--	144	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} = 100V, I _D =25A, V _{GS} = 10V R _G = 25 Ω	--	53	--	ns
Turn-on Rise Time	t _r		--	65	--	
Turn-off Delay Time	t _{d(off)}		--	689	--	
Turn-off Fall Time	t _f		--	230	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25 °C	--	--	60	A
Pulsed Diode Forward Current	I _{SM}		--	--	270	
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = 25A, V _{GS} = 0V	--	--	1.5	V
Reverse Recovery Time	t _{rr}	V _{GS} = 0V, I _S = 25A, di _F /dt =100A /μs	--	208	--	ns
Reverse Recovery Charge	Q _{rr}		--	2.04	--	μC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS} = 30A, V_{DD} = 30V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

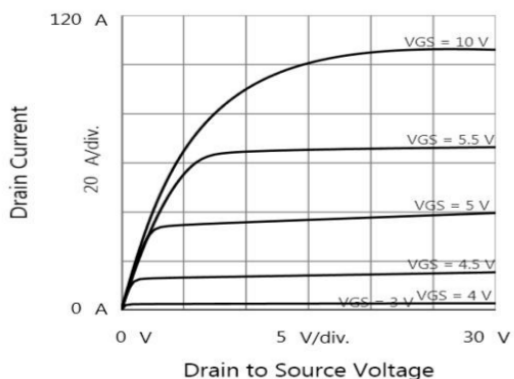


Figure 2. Transfer Characteristics

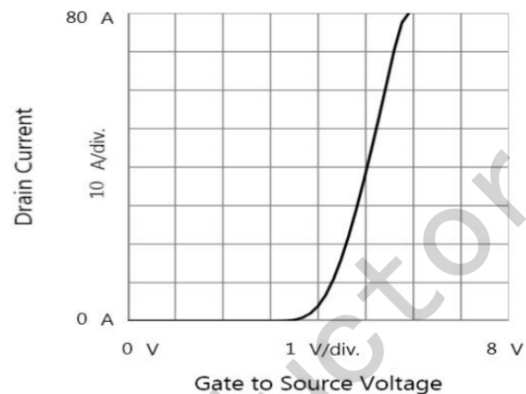


Figure 3. Maximum Continuous Drain Current vs Case Temperature

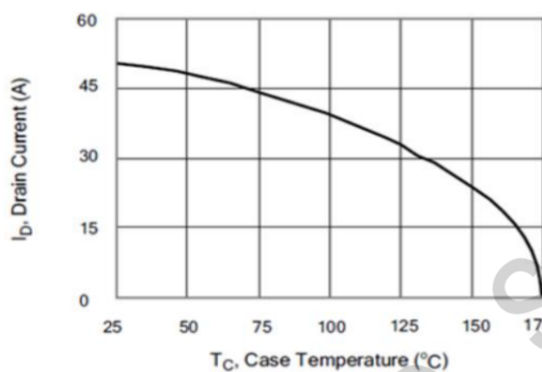


Figure 4. Drain to Source Voltage vs. Gate to Source Voltage

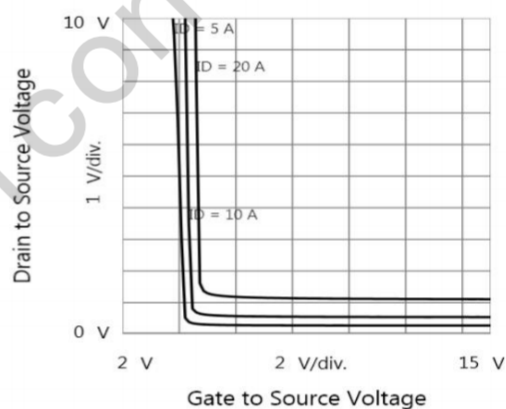


Figure 5. Typical Breakdown Voltage vs Junction Temperature

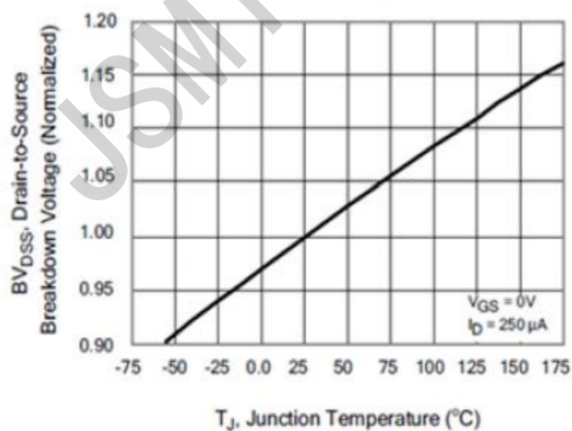
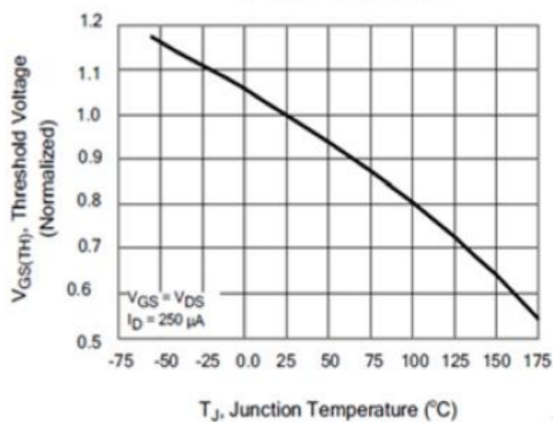


Figure 6. Typical Threshold Voltage vs Junction Temperature



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Capacitance

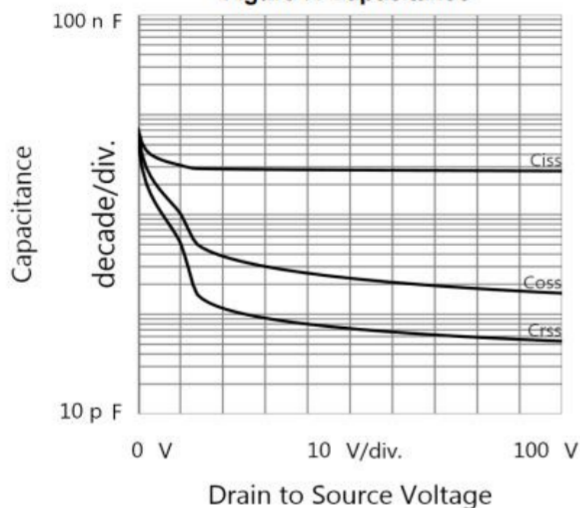
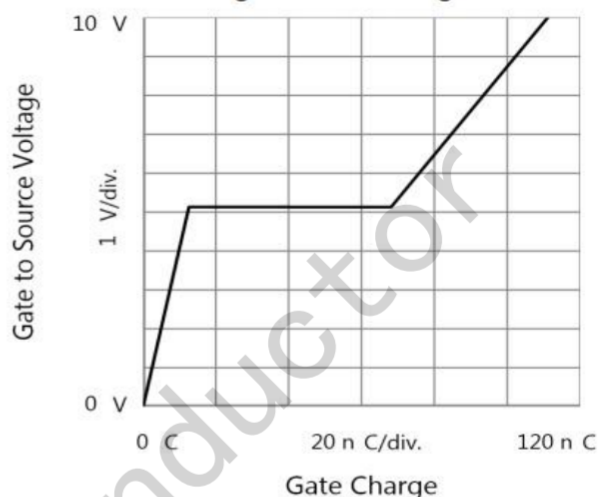
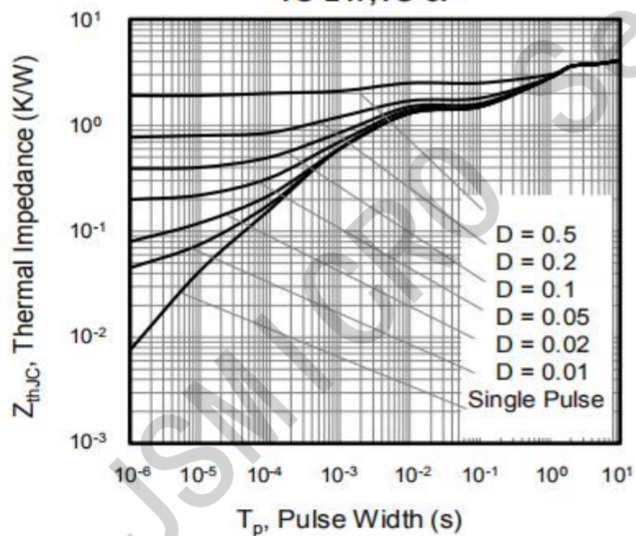


Figure 8. Gate Charge



**Figure 9. Transient Thermal Impedance
TO-247, TO-3P**



**Figure 10. Maximum Forward Bias Safe
Operating Area**

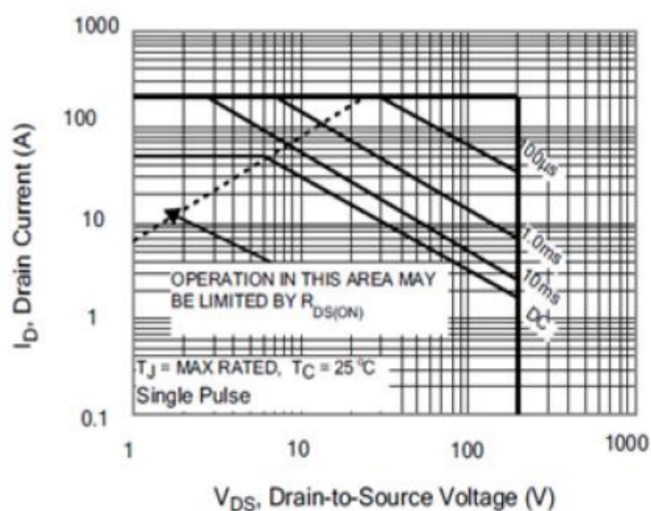


Figure A: Gate Charge Test Circuit and Waveform

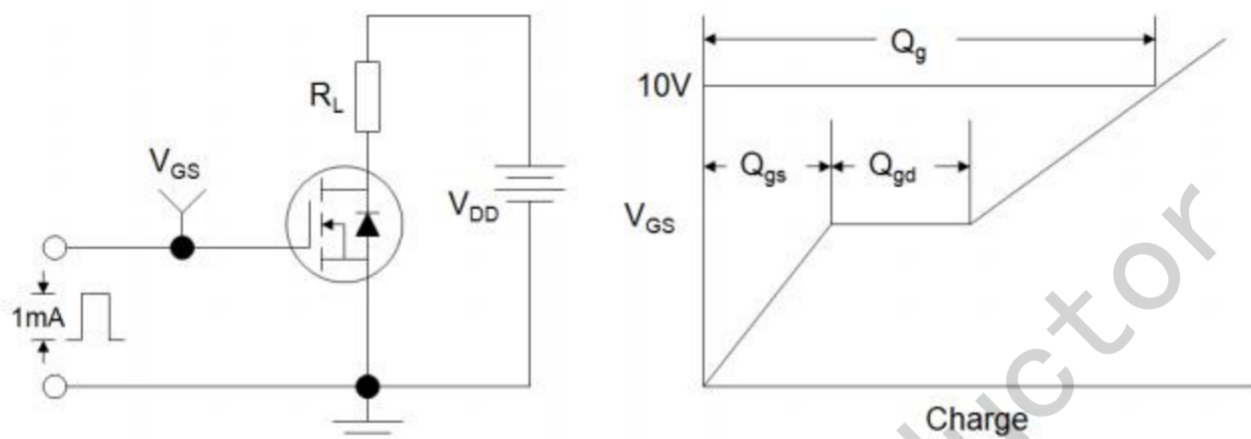


Figure B: Resistive Switching Test Circuit and Waveform

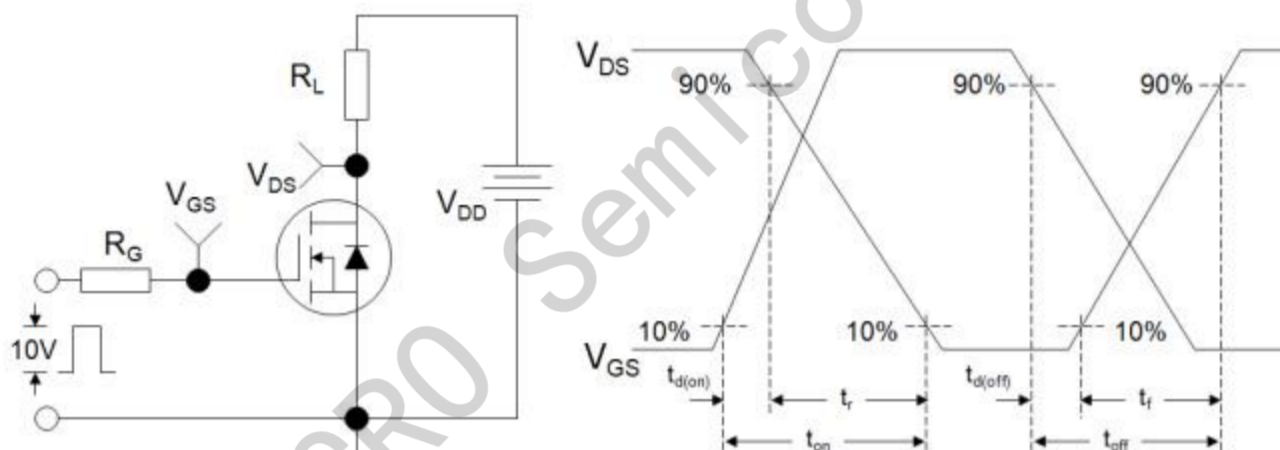
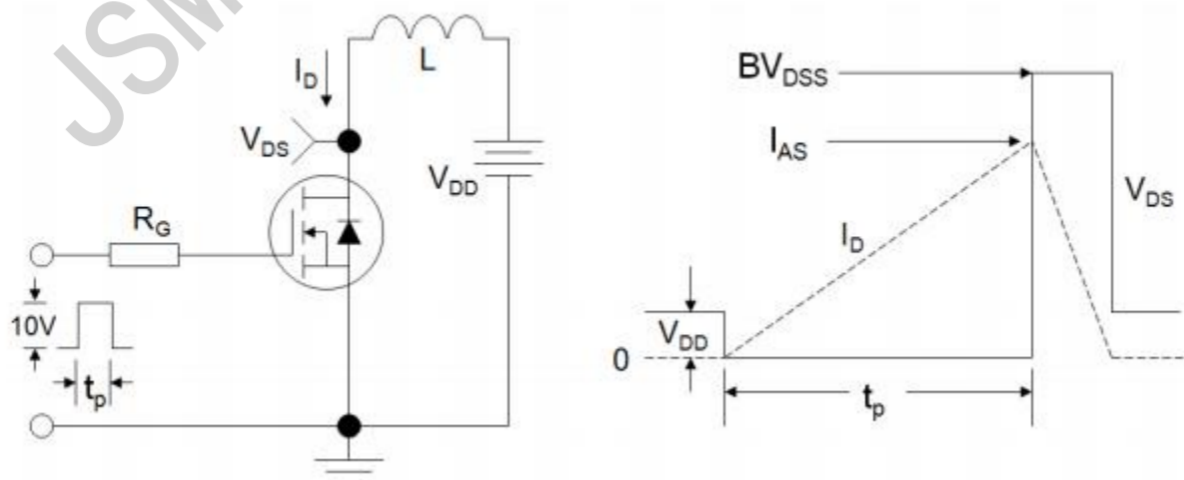
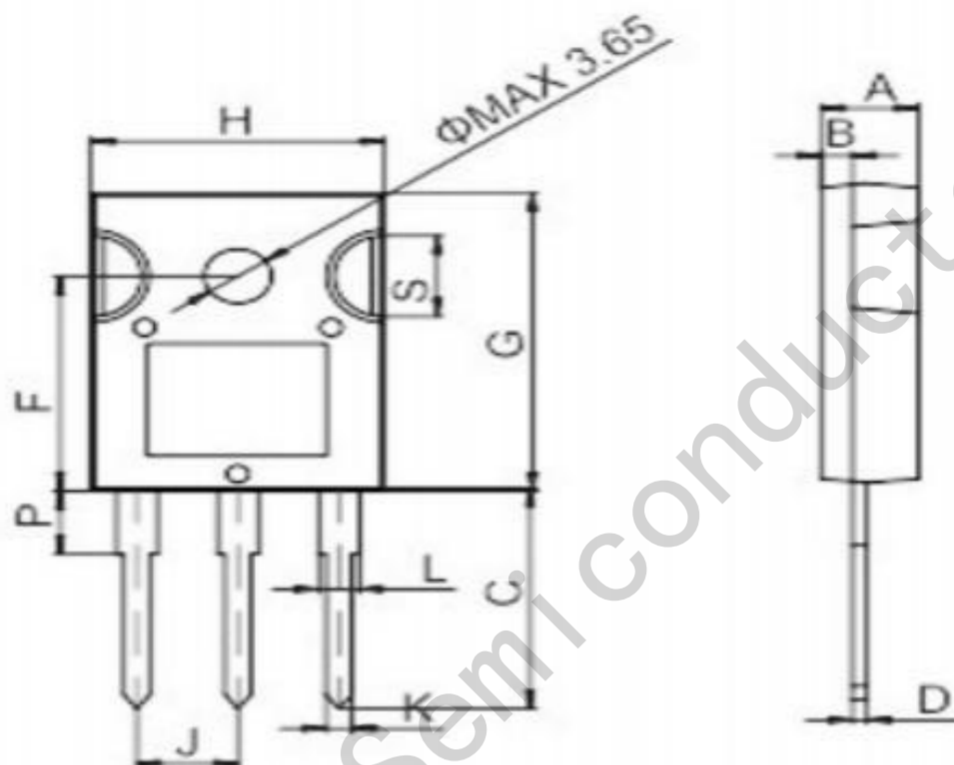


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



TO-247



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.9		5.4	0.193		0.213
B	1.6		2.0	0.063		0.079
C	14.35		15.4	0.565		0.606
D	0.5		0.8	0.020		0.031
F	14.4		15.1	0.567		0.594
G	19.7		20.6	0.775		0.811
H	15.4		16.2	0.606		0.638
J	5.3		5.6	0.209		0.220
K	1.3		1.5	0.051		0.059
L	2.8		3.3	0.110		0.130
P	3.7		4.2	0.146		0.165
S	5.35		5.65	0.211		0.222