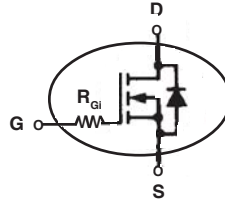


# Power MOSFET with Extended FBSOA

IXTH30N50L  
IXTQ30N50L  
IXTT30N50L

N-Channel Enhancement Mode



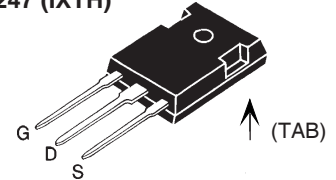
$$V_{DSS} = 500V$$

$$I_{D25} = 30A$$

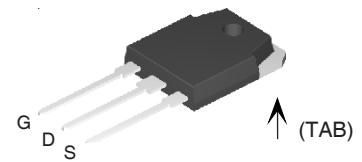
$$R_{DS(on)} \leq 0.20\Omega$$

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	500	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ , $R_{GS} = 1M\Omega$	500	V
$V_{GSS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	30	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	60	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	30	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	50	mJ
$E_{AS}$		1.5	J
$P_D$	$T_C = 25^\circ\text{C}$	400	W
$T_J$		-55 to +150	$^\circ\text{C}$
$T_{JM}$		+150	$^\circ\text{C}$
$T_{stg}$		-55 to +150	$^\circ\text{C}$
$T_L$	1.6mm (0.063in) from case for 10s	300	$^\circ\text{C}$
$T_{SOLD}$	Plastic body for 10s	260	$^\circ\text{C}$
$M_d$	Mounting torque (TO-247, TO-3P)	1.13/10	Nm/lb.in.
Weight	TO-247	6.0	g
	TO-3P	5.5	g
	TO-268	5.0	g

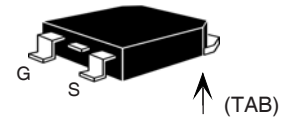
TO-247 (IXTH)



TO-3P (IXTQ)



TO-268 (IXTT)



G = Gate    D = Drain  
S = Source    TAB = Drain

## Features

- Designed for linear operation
- International standard packages
- Unclamped Inductive Switching (UIS) rated.
- Molding epoxies meet UL 94 V-0 flammability classification
- Integrated gate resistor for easy paralleling
- Guaranteed FBSOA at  $75^\circ\text{C}$

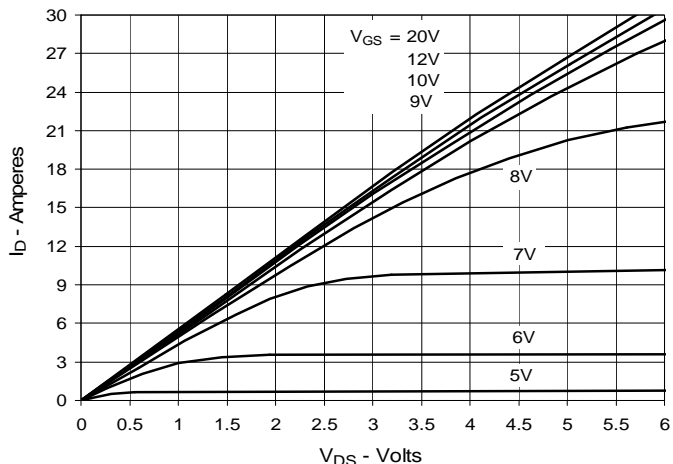
## Applications

- Solid state circuit breakers
- Soft start controls
- Linear amplifiers
- Programmable loads
- Current regulators

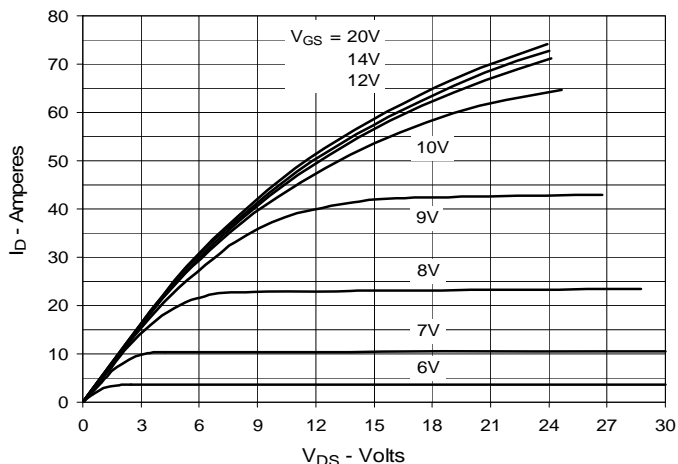
Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$				
$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.5		4.5 V
$I_{GSS}$	$V_{GS} = \pm 30V, V_{DS} = 0V$			$\pm 100$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$			50 $\mu\text{A}$
	$V_{GS} = 0V$ $T_J = 125^\circ\text{C}$			300 $\mu\text{A}$
$R_{DS(on)}$	$V_{GS} = 10V, I_D = 0.5 \cdot I_{D25}$ , Note 1			0.20 $\Omega$



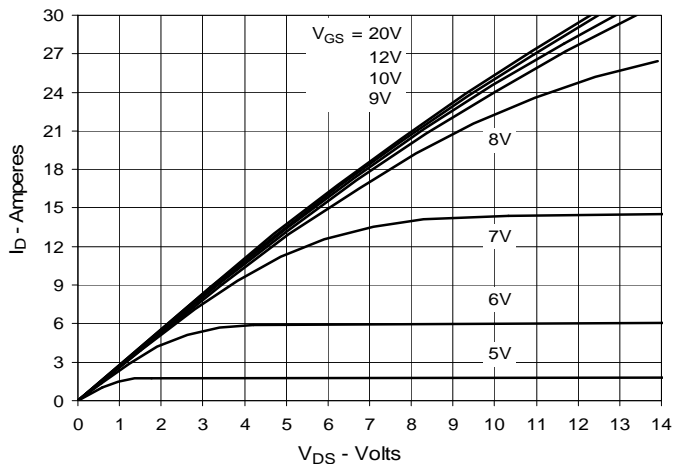
**Fig. 1. Output Characteristics**  
@  $T_J = 25^\circ\text{C}$



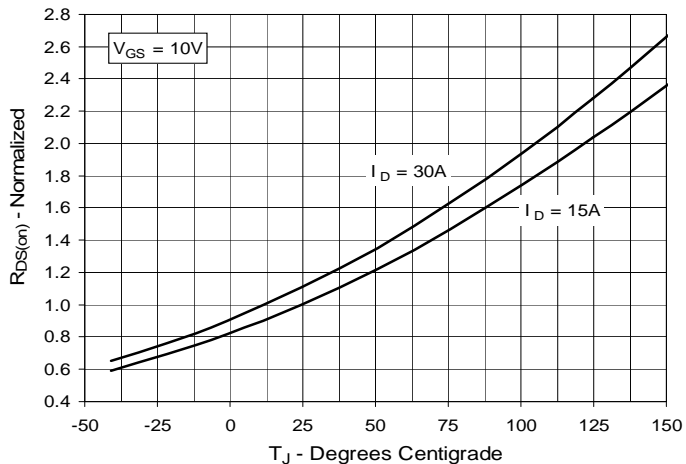
**Fig. 2. Extended Output Characteristics**  
@  $T_J = 25^\circ\text{C}$



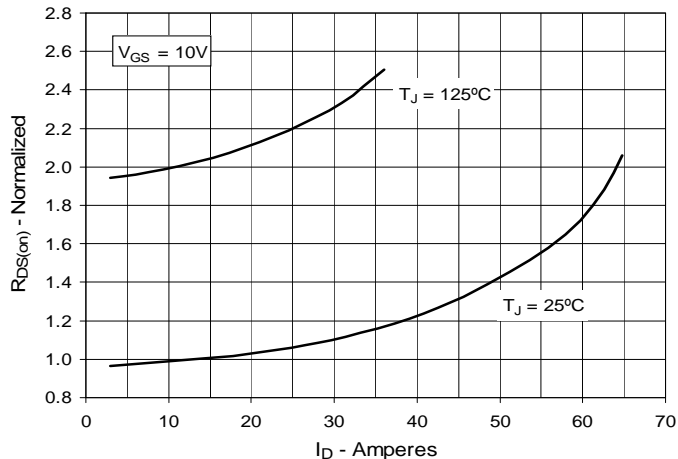
**Fig. 3. Output Characteristics**  
@  $T_J = 125^\circ\text{C}$



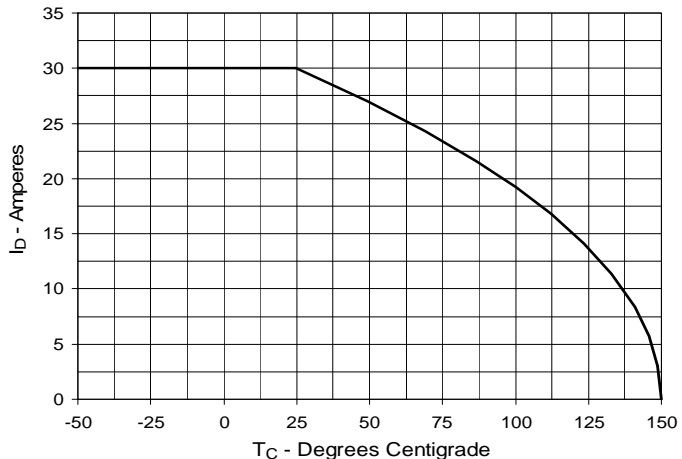
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 15\text{A}$  Value vs. Junction Temperature**



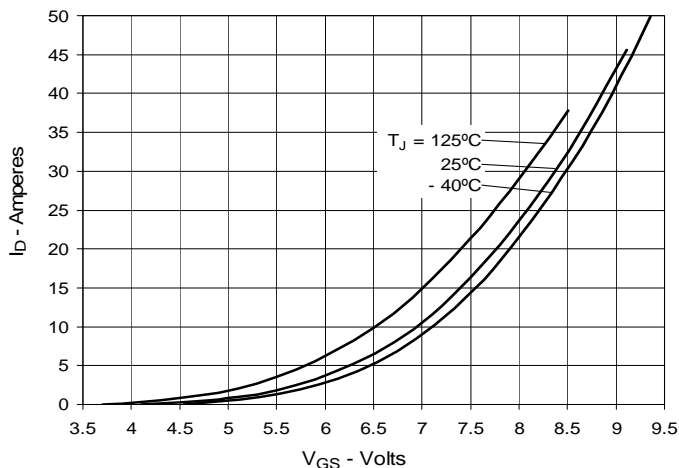
**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 15\text{A}$  Value vs. Drain Current**



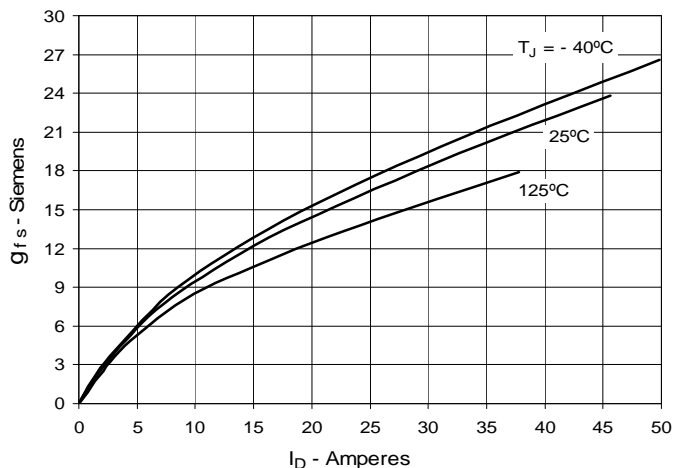
**Fig. 6. Maximum Drain Current vs. Case Temperature**



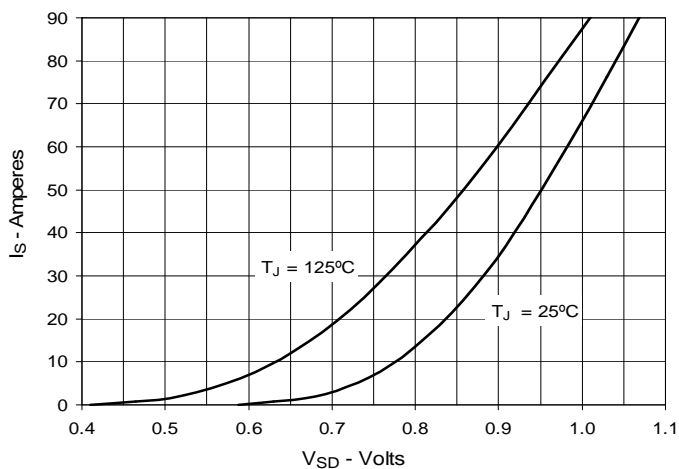
**Fig. 7. Input Admittance**



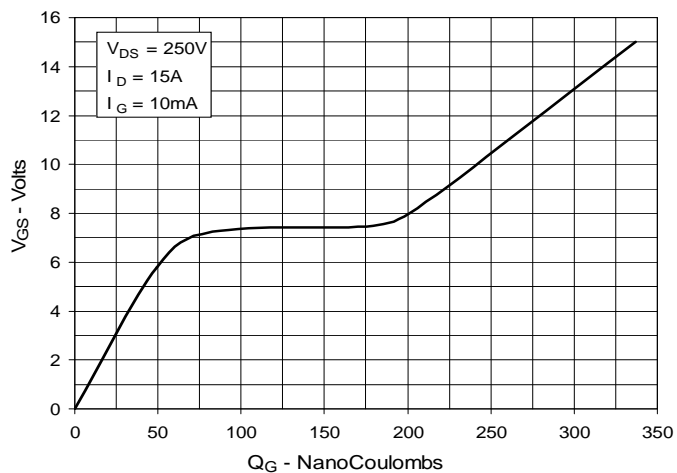
**Fig. 8. Transconductance**



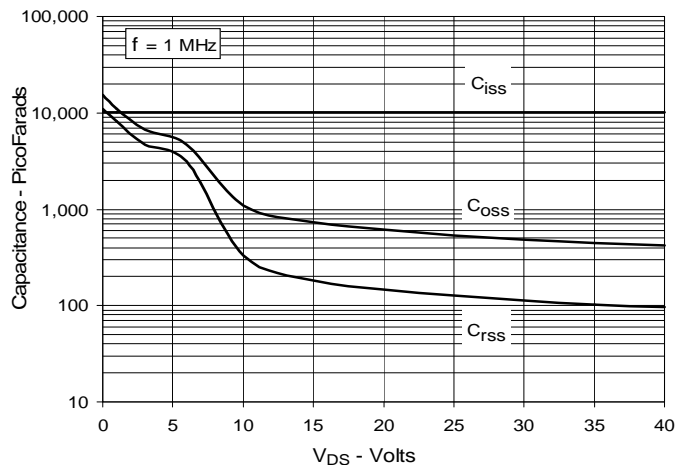
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



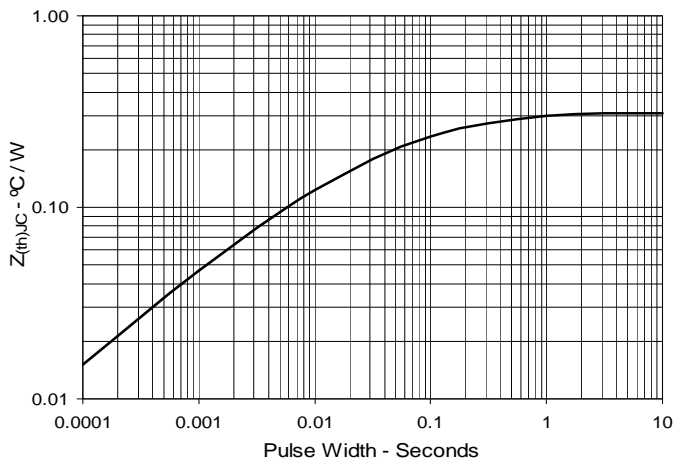
**Fig. 10. Gate Charge**



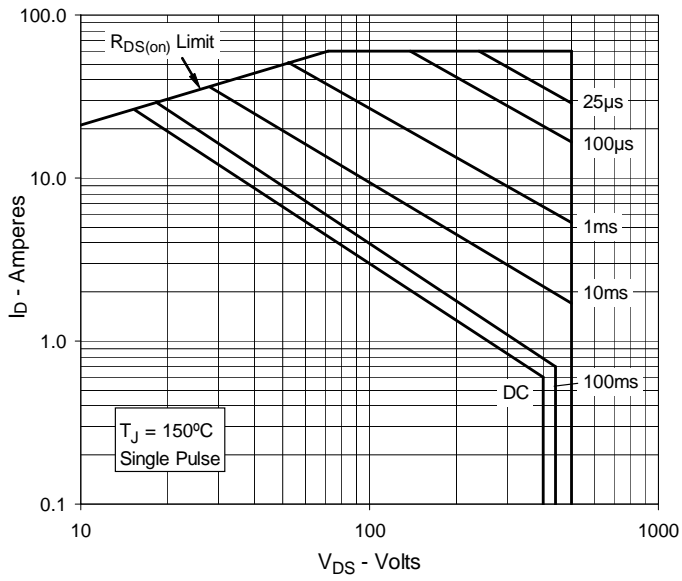
**Fig. 11. Capacitance**



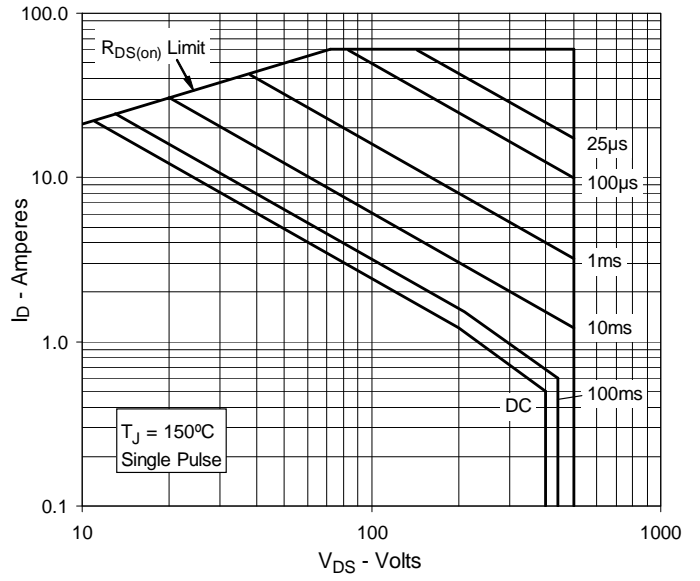
**Fig. 12. Maximum Transient Thermal Impedance**



**Fig. 13. Forward-Bias Safe Operating Area**  
@  $T_C = 25^\circ\text{C}$



**Fig. 14. Forward-Bias Safe Operating Area**  
@  $T_C = 75^\circ\text{C}$





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