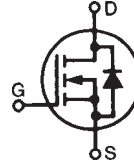


# Trench Gate Power MOSFET

IXTQ 160N085T  
IXTA 160N085T  
IXTP 160N085T

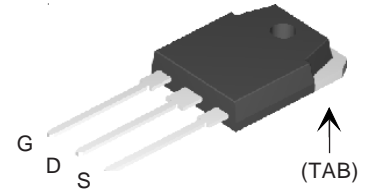
$V_{DSS} = 85 \text{ V}$   
 $I_{D25} = 160 \text{ A}$   
 $R_{DS(on)} = 6.0 \text{ m}\Omega$

N-Channel Enhancement Mode

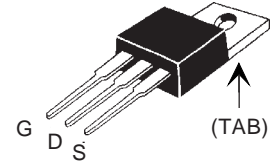


Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$	85	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	85	V
$V_{GSM}$		$\pm 20$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	160	A
$I_{DRMS}$	External lead current limit	75	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	350	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	75	A
$E_{AS}$	$T_C = 25^\circ\text{C}$	1.0	J
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$ , $R_G = 10 \Omega$	3	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	360	W
$T_J$		-55 ... +175	$^\circ\text{C}$
$T_{JM}$		175	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$T_L$	1.6 mm (0.062 in.) from case for 10 s Maximum tab temperature for soldering TO-263 package for 10s	300 260	$^\circ\text{C}$ $^\circ\text{C}$
$M_d$	Mounting torque (TO-3P / TO-220)	1.13/10	Nm/lb.in.
Weight	TO-3P	5.5	g
	TO-220	4	g
	TO-263	3	g

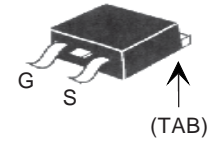
TO-3P (IXTQ)



TO-220 (IXTP)



TO-263 (IXTA)



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

## Features

- International standard packages
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect

## Advantages

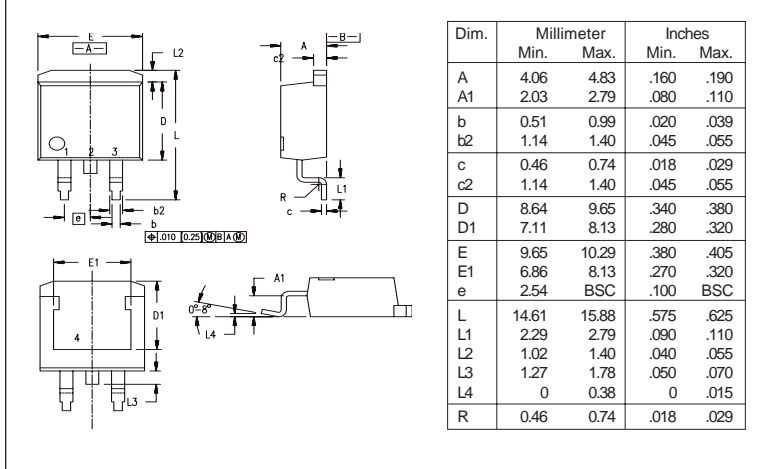
- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$	85		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 1 \text{ mA}$	2.0		V
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$			$\pm 200 \text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}$			1 $\mu\text{A}$
	$V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			250 $\mu\text{A}$
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$ , $I_D = 50 \text{ A}$ Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2\%$	5.0	6.0	$\text{m}\Omega$

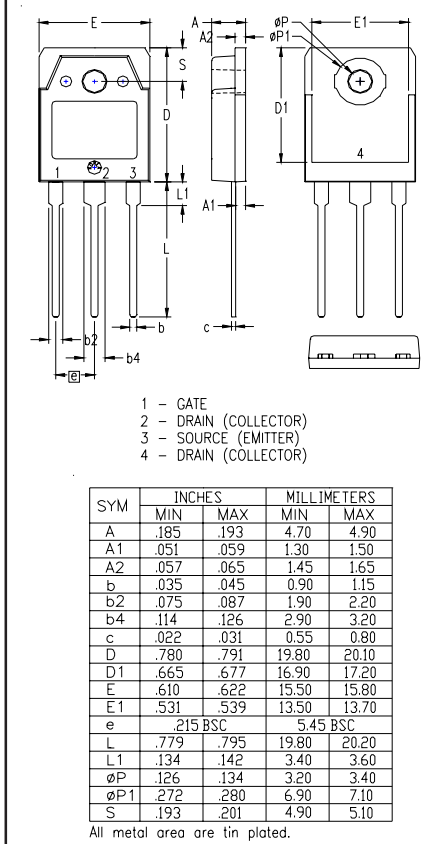
Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = 50\text{ A}$ , pulse test	64	85	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		6400	pF
$C_{oss}$			927	pF
$C_{rss}$			92	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 60\text{ V}, I_D = 35\text{ A}$ $R_G = 5\ \Omega$ (External)		37	ns
$t_r$			61	ns
$t_{d(off)}$			65	ns
$t_f$			36	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 40\text{ V}, I_D = 80\text{ A}$		164	nC
$Q_{gs}$			48	nC
$Q_{gd}$			45	nC
$R_{thJC}$				0.42 K/W
$R_{thCK}$	(TO-3P)	0.21		K/W
	(TO-220)	0.25		K/W

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		Min.	typ.	Max.
$I_s$	$V_{GS} = 0\text{ V}$			160 A
$I_{SM}$	Repetitive			350 A
$V_{SD}$	$I_F = 50\text{ A}, V_{GS} = 0\text{ V}$ , Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$			1.2 V
$t_{rr}$	$I_F = 25\text{ A}$ $-di/dt = 100\text{ A}/\mu\text{s}$		100	ns
$Q_{RM}$	$V_R = 25\text{ V}$		0.6	$\mu\text{C}$

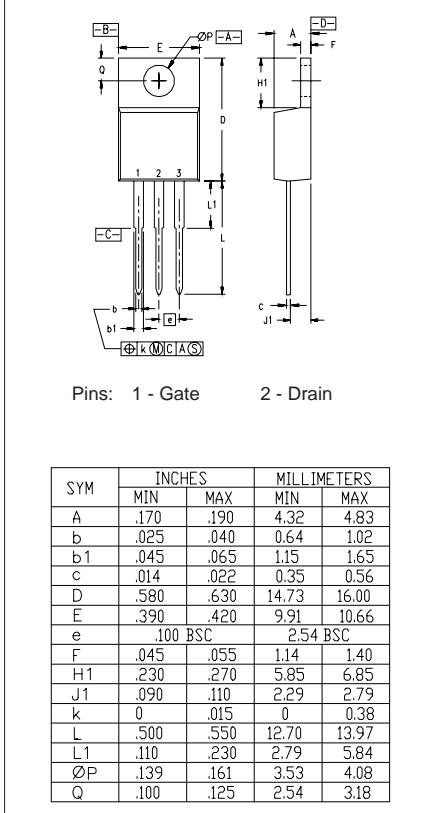
**TO-263 (IXTA) Outline**



**TO-3P (IXTQ) Outline**



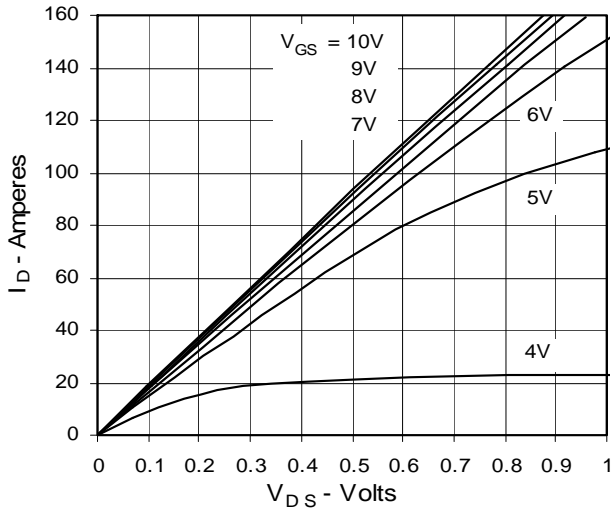
**TO-220 (IXTP) Outline**



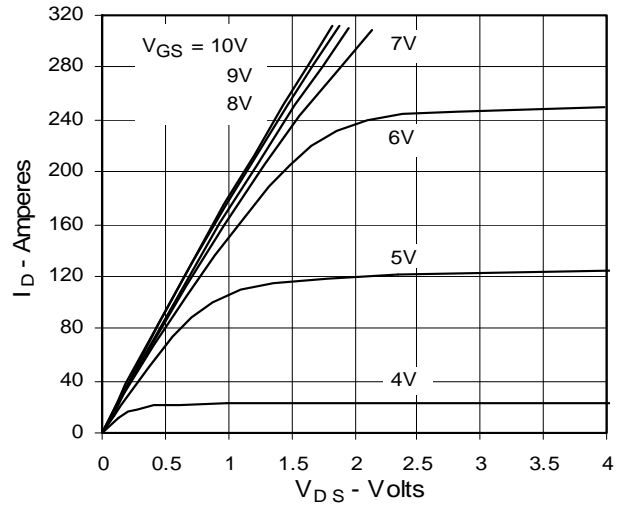
IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	

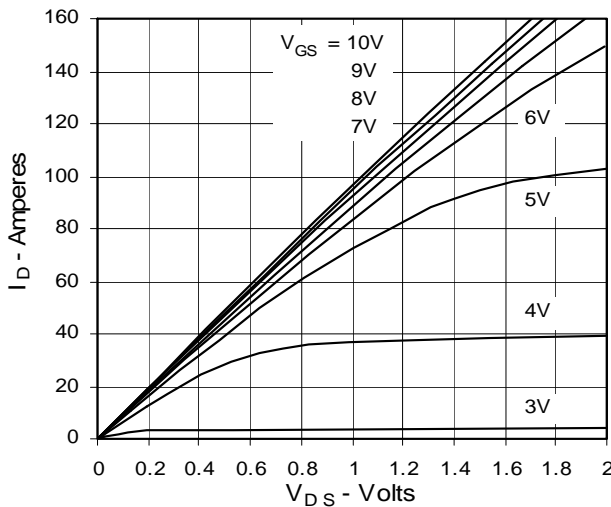
**Fig. 1. Output Characteristics @ 25°C**



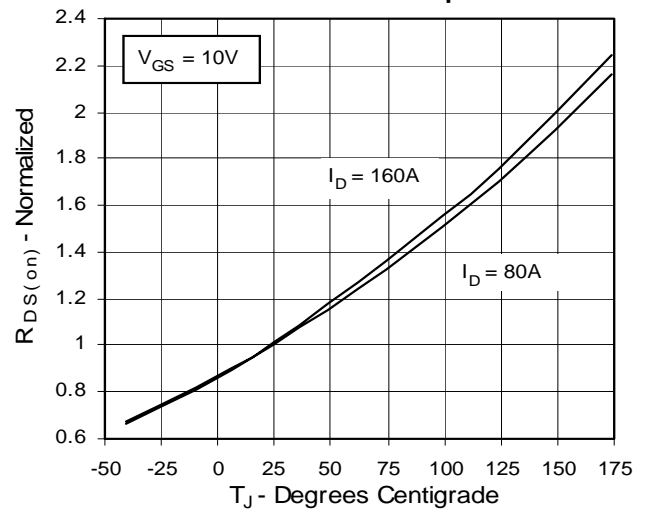
**Fig. 2. Extended Output Characteristics @ 25°C**



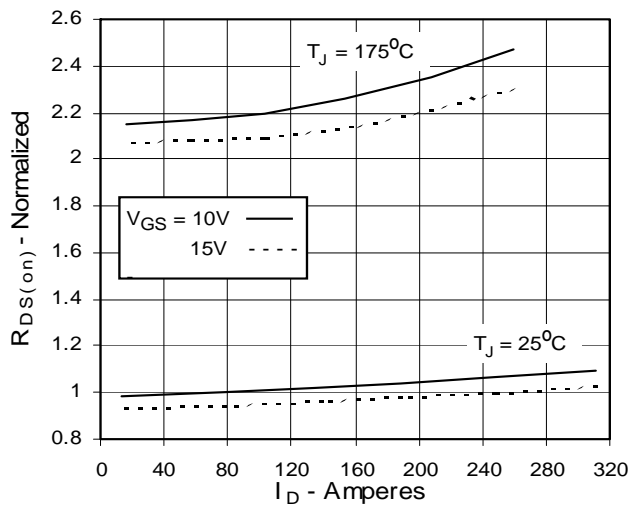
**Fig. 3. Output Characteristics @ 150°C**



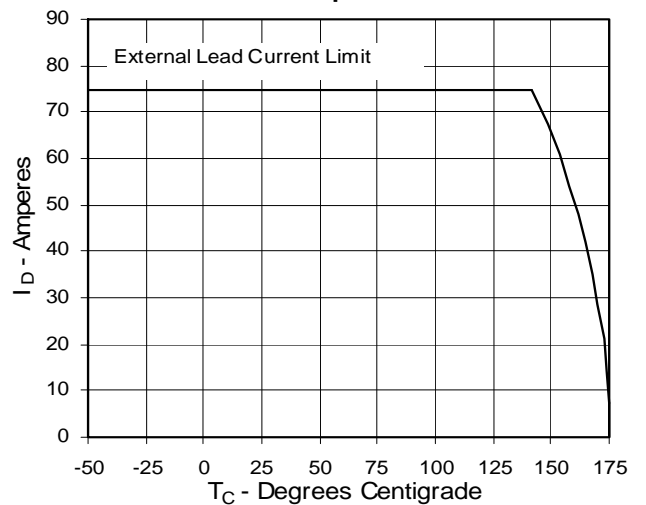
**Fig. 4.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Junction Temperature**



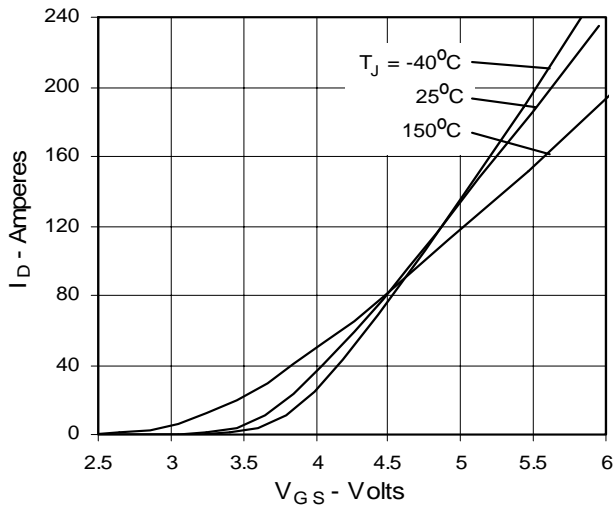
**Fig. 5.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Drain Current**



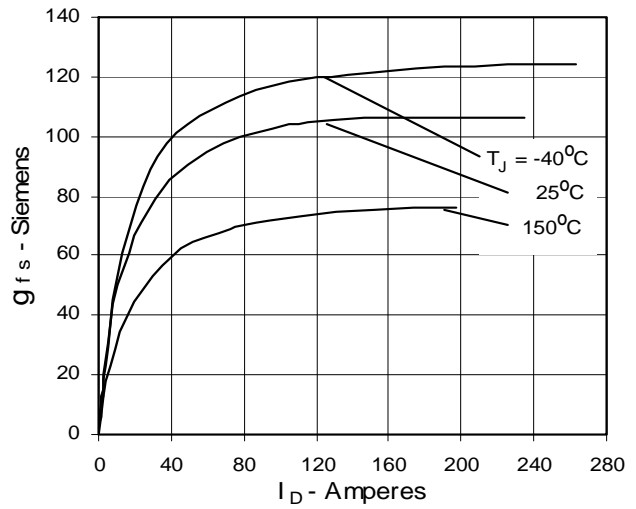
**Fig. 6. Drain Current vs. Case Temperature**



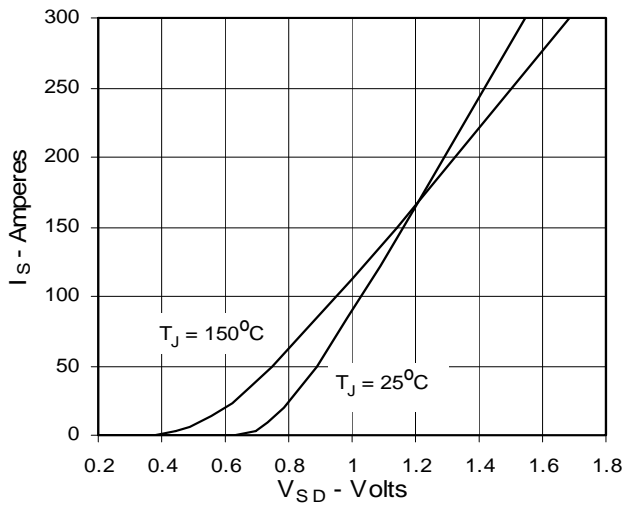
**Fig. 7. Input Admittance**



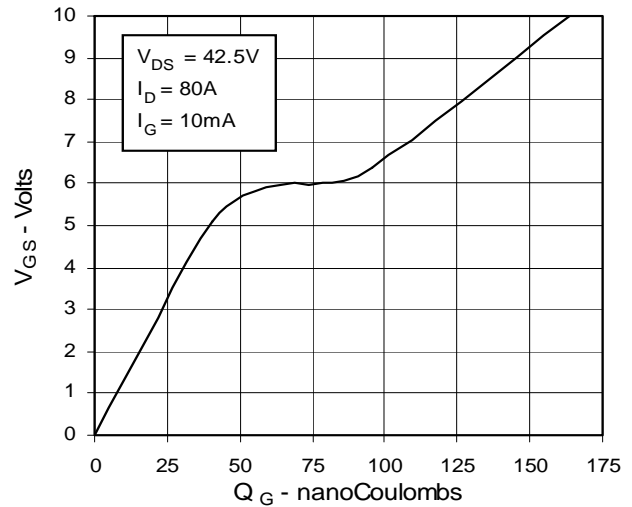
**Fig. 8. Transconductance**



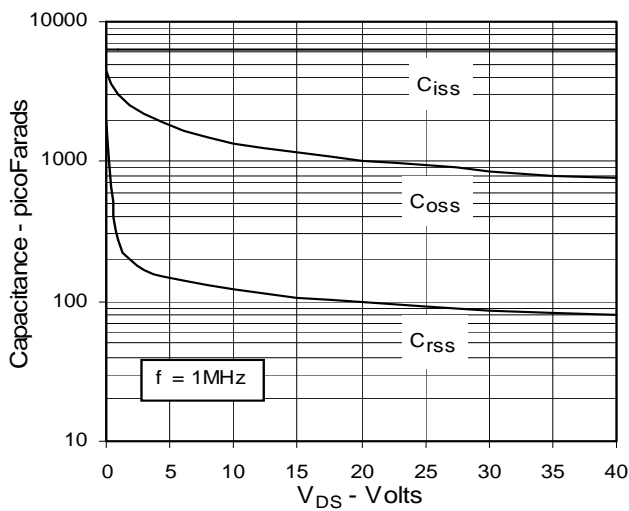
**Fig. 9. Source Current vs. Source-To-Drain Voltage**



**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



**Fig. 12. Forward-Bias Safe Operating Area**

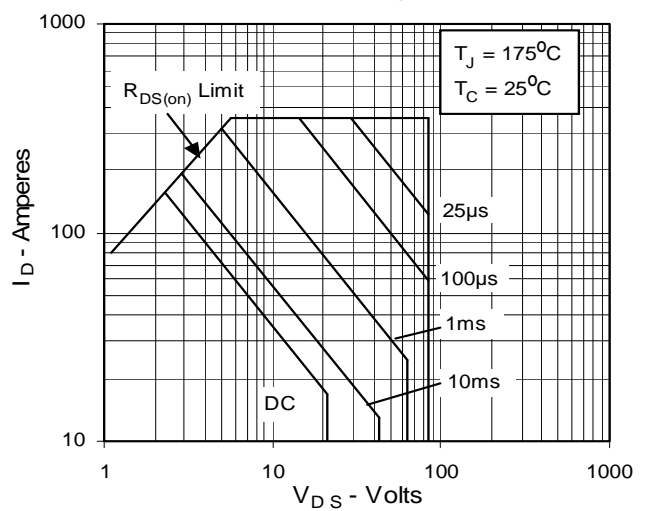


Fig. 13. Maximum Transient Thermal Resistance

