



Advanced Technical Information

**PolarHT™
Power MOSFET**

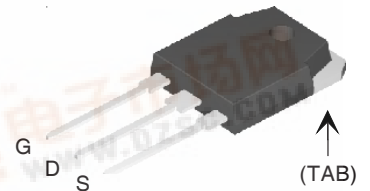
**IXTQ 36N30P
IXTA 36N30P
IXTP 36N30P**

**V_{DSS} = 300 V
I_{D25} = 36 A
R_{DS(on)} = 110 mΩ**

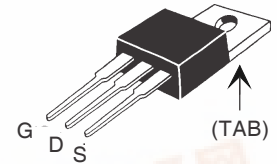
N-Channel Enhancement Mode



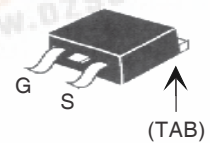
TO-3P (IXTQ)



TO-220 (IXTP)



TO-263 (IXTA)



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

Symbol	Test Conditions	Maximum Ratings	
V _{DSS}	T _J = 25°C to 150°C	300	V
V _{DGR}	T _J = 25°C to 150°C; R _{GS} = 1 MΩ	300	V
V _{GSM}		±20	V
I _{D25}	T _C = 25°C	36	A
I _{DM}	T _C = 25°C, pulse width limited by T _{JM}	90	A
I _{AR}	T _C = 25°C	36	A
E _{AR}	T _C = 25°C	30	mJ
E _{AS}	T _C = 25°C	1.0	J
dv/dt	I _S ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} , T _J ≤ 150°C, R _G = 10 Ω	10	V/ns
P _D	T _C = 25°C	300	W
T _J		-55 ... +150	°C
T _{JM}		150	°C
T _{stg}		-55 ... +150	°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	°C °C
M _d	Mounting torque (TO-3P / TO-220)	1.13/10	Nm/lb.in.
Weight	TO-3P TO-220 TO-263	5.5 4 3	g g g

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

PolarHT™ DMOS transistors utilize proprietary designs and process. US patent is pending.

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
V _{DSS}	V _{GS} = 0 V, I _D = 250 μA	300		V
V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.5		5.0 V
I _{GSS}	V _{GS} = ±20 V _{DC} , V _{DS} = 0			±100 nA
I _{DSS}	V _{DS} = V _{DSS} V _{GS} = 0 V T _J = 125°C			25 μA 250 μA
R _{DS(on)}	V _{GS} = 10 V, I _D = 0.5 I _{D25} Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %	92		110 mΩ



Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{ V}$; $I_D = 0.5 I_{D25}$, pulse test	12	22	S
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		2250	pF
C_{oss}			370	pF
C_{rss}			90	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = I_{D25}$ $R_G = 10\ \Omega$ (External)		24	ns
t_r			30	ns
$t_{d(off)}$			97	ns
t_f			28	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = 0.5 I_{D25}$		70	nC
Q_{gs}			17	nC
Q_{gd}			35	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	$V_{GS} = 0\text{ V}$			36 A
I_{SM}	Repetitive			90 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{rr}	$I_F = 25\text{ A}$ $-di/dt = 100\text{ A}/\mu\text{s}$		250	ns
Q_{RM}	$V_R = 100\text{ V}$		2.0	μC

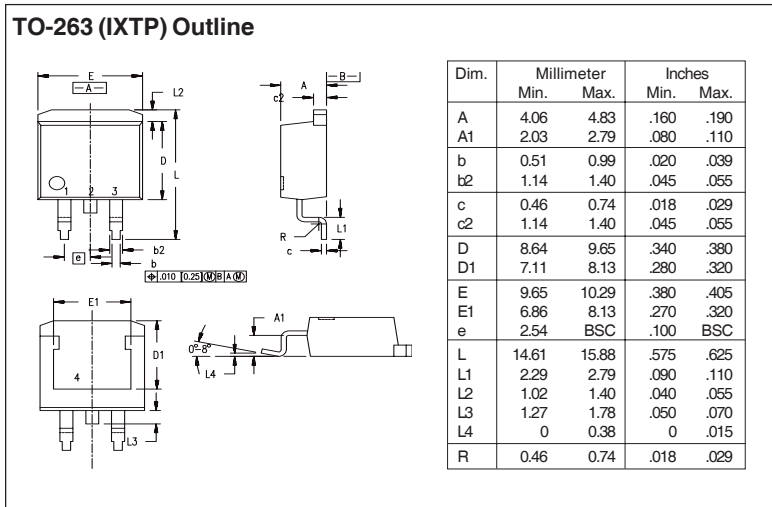
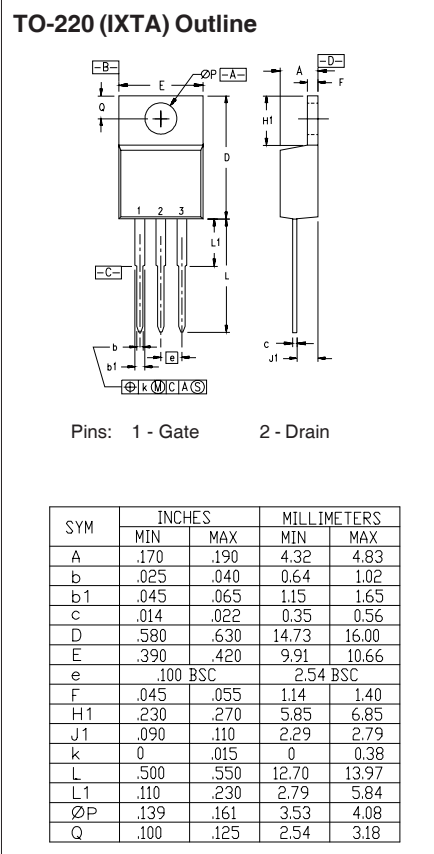
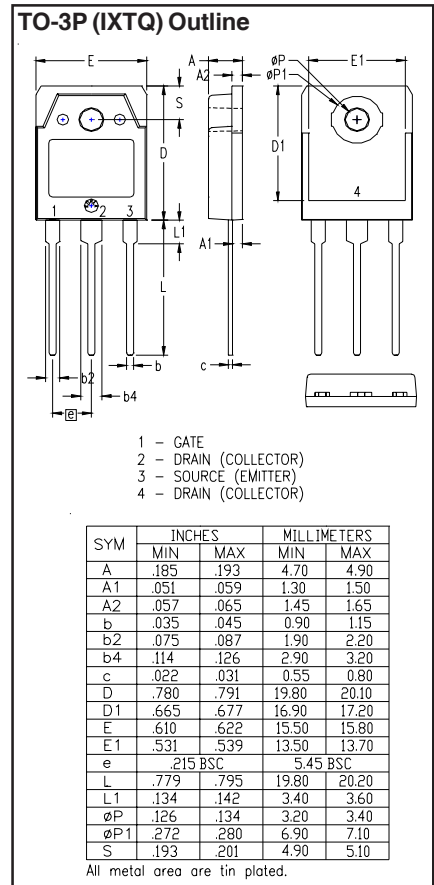


Fig. 1. Output Characteristics @ 25°C

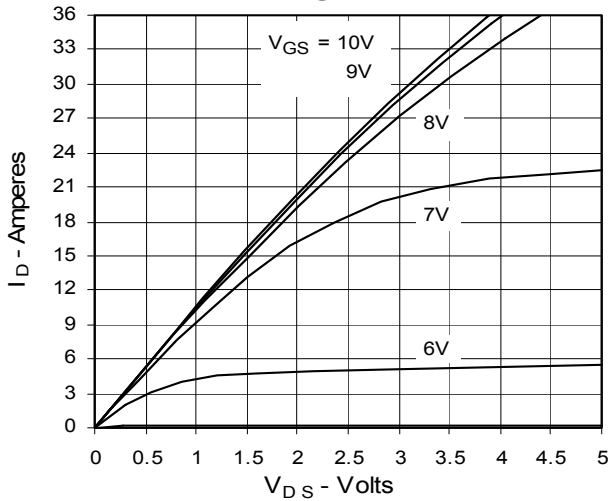


Fig. 2. Extended Output Characteristics @ 25°C

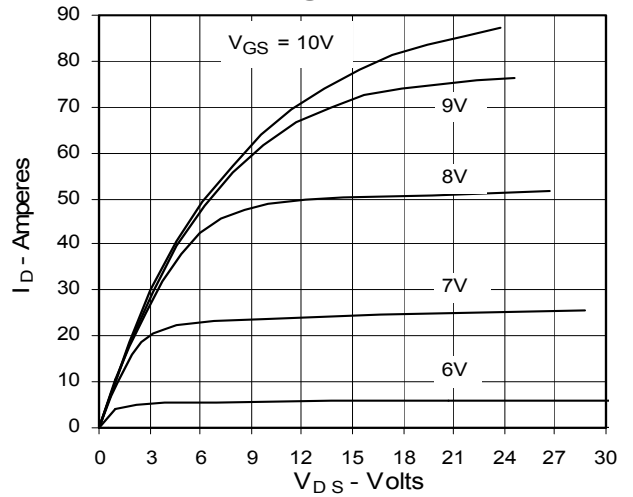


Fig. 3. Output Characteristics @ 125°C

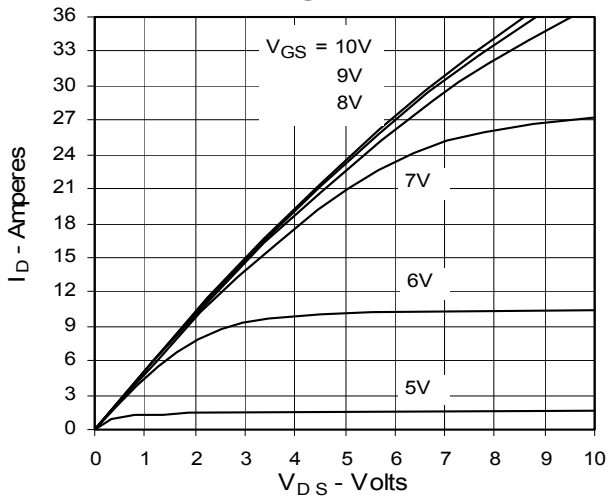


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

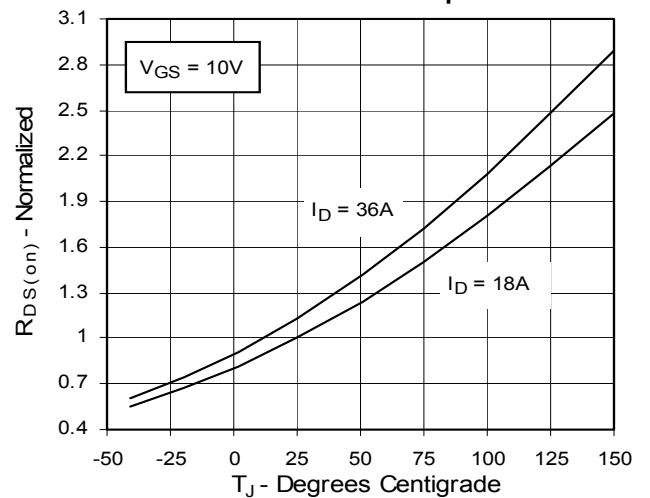


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

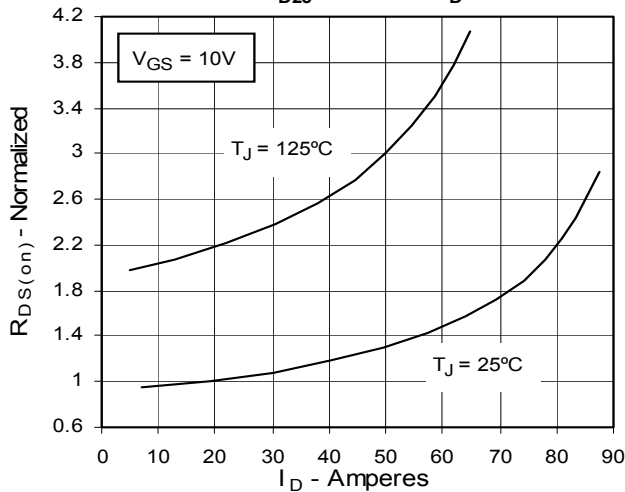


Fig. 6. Drain Current vs. Case Temperature

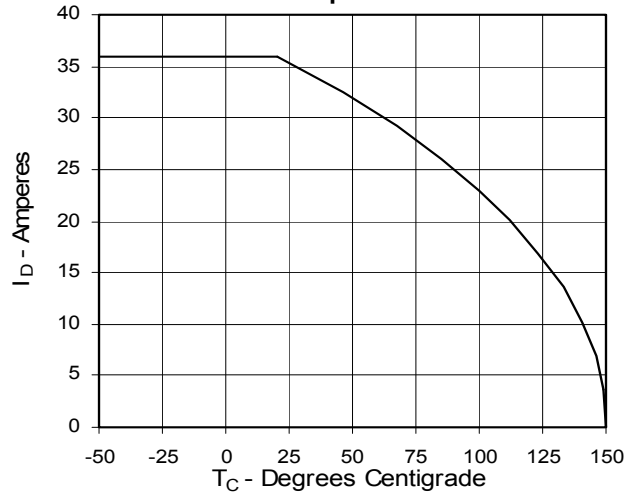


Fig. 7. Input Admittance

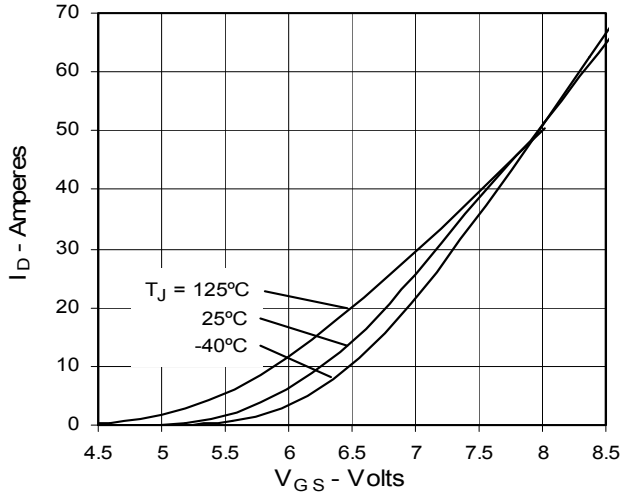


Fig. 8. Transconductance

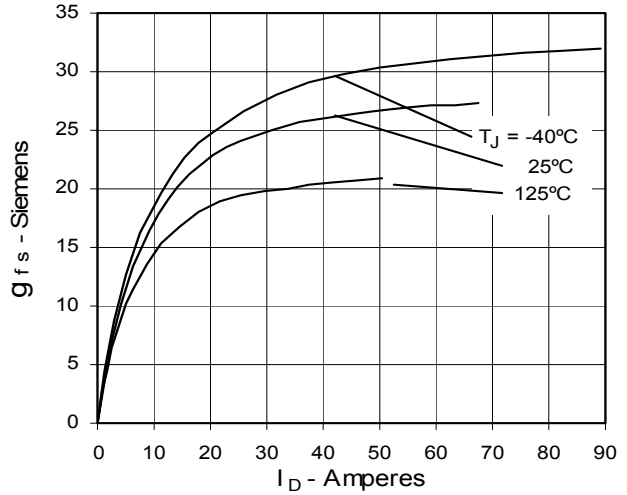


Fig. 9. Source Current vs. Source-To-Drain Voltage

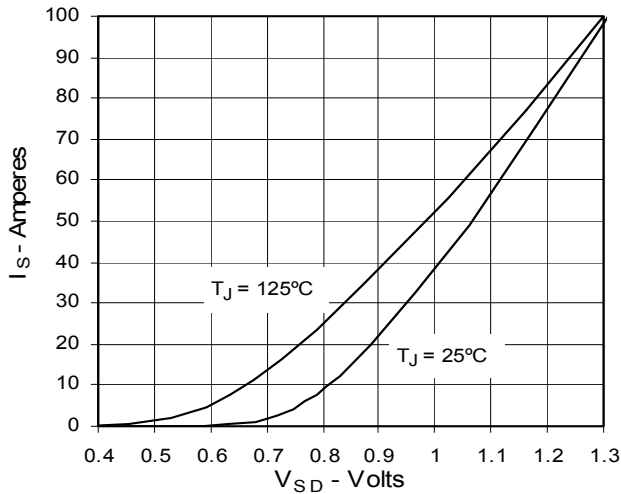


Fig. 10. Gate Charge

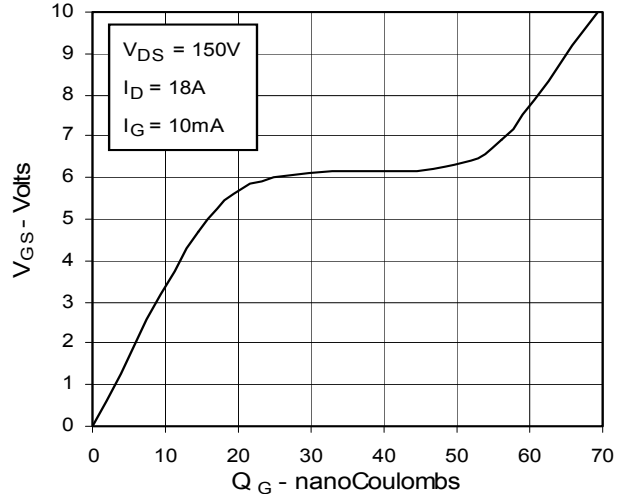


Fig. 11. Capacitance

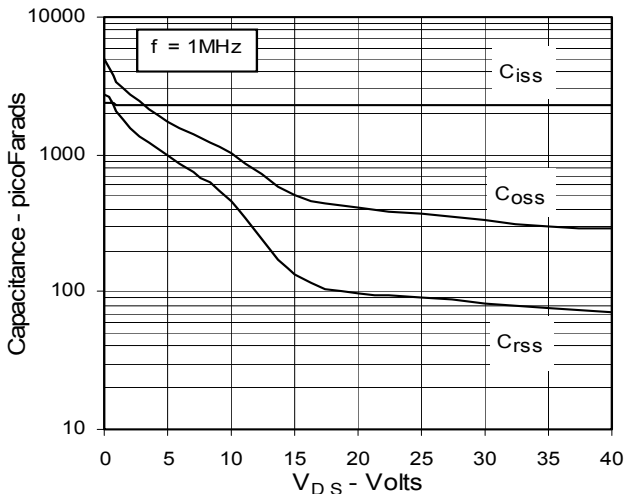


Fig. 12. Forward-Bias Safe Operating Area

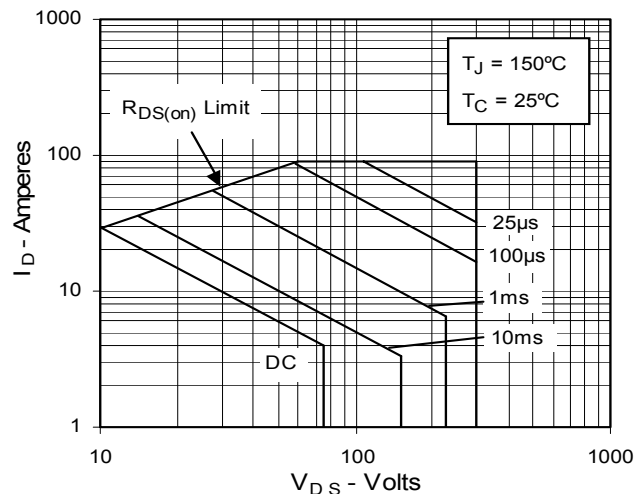


Fig. 13. Maximum Transient Thermal Resistance

