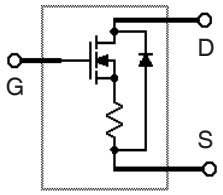
IXYS

Gate Controlled Current Limiter

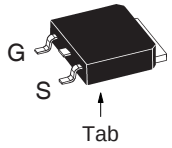
IXCY01N90E
IXCP01N90E

V_{DSS} = 900V
$I_{D(limit)}$ = 250mA
$R_{DS(on)}$ ≤ 80Ω

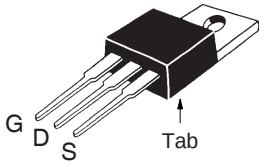
N-Channel Enhancement Mode



TO-252 AA (IXCY)



TO-220 (IXCP)



G = Gate D = Drain
S = Source Tab = Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	900	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	900	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
P_D	T_C = 25°C	40	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6mm (0.062in.) from Case for 10s	300	°C
T_{sold}	Plastic Body for 10 seconds	260	°C
M_d	Mounting Torque (TO-220)	1.13 / 10	Nm/lb.in.
Weight	TO-220	3.00	g
	TO-252	0.35	g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 25μA	900			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 25μA	2.5		5.0	V
I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V			±50	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			10	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 50mA, Note 1			80	mΩ
I_{DP}	Plateau Current, V_{GS} = 10V, V_{DS} = 10V	125		175	mA

Features

- High Output Resistance in Saturated Mode of Operation
- Rugged HDMOS™ Process
- Stable Peak Drain Current Limit
- High Voltage Current Regulator
- International Standard Packages

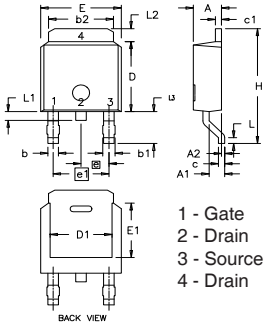
Applications

- Current Regulation
- Over Current and Over Voltage Protection for Sensitive Loads
- Linear Regulator

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 20V, I_D = 100mA, Note 1		28	40	mS
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		158		pF
C_{oss}			22		pF
C_{rss}			6.6		pF
$t_{d(on)}$	**Resistive Switching Times**		21		ns
t_r	V_{GS} = 10V, V_{DS} = 50V, I_D = 50mA		27		ns
$t_{d(off)}$	R_G = 50Ω (External)		61		ns
t_f			74		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 50mA		6.1		nC
Q_{gs}			0.9		nC
Q_{gd}			3.7		nC
$\Delta I_{A(P)}/\Delta T$	Plateau Current Shift with Temperature V_{DS} = 10V, V_{GS} = 10V		±50		ppm/K
$\Delta V_{AK}/\Delta I_{A(p)}$	Dynamic Resistance, V_{DS} = 20V, V_{GS} = 10V	125			kΩ
V_F	I_F = 50mA, V_{GS} = 0V, Note 1			1.3	V
R_{thJC}				3.10	°C/W
R_{thCS}			0.50		°C/W
R_{thCA}	TO-220		80		°C/W
	TO-252		125		°C/W

Note 1. Pulse test, t ≤ 300μs; duty cycle, d ≤ 2%.

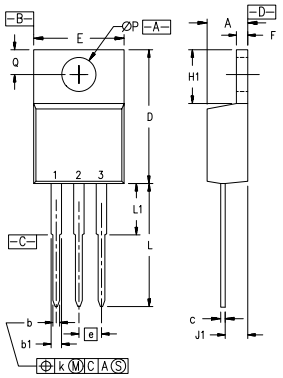
TO-252 AA (IXCY) Outline



1 - Gate
2 - Drain
3 - Source
4 - Drain

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	2.19	2.38	0.086	0.094
A1	0.89	1.14	0.035	0.045
A2	0	0.13	0	0.005
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.21	5.46	0.205	0.215
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
D1	4.32	5.21	0.170	0.205
E	6.35	6.73	0.250	0.265
E1	4.32	5.21	0.170	0.205
e	2.28 BSC		0.090 BSC	
e1	4.57 BSC		0.180 BSC	
H	9.40	10.42	0.370	0.410
L	0.51	1.02	0.020	0.040
L1	0.64	1.02	0.025	0.040
L2	0.89	1.27	0.035	0.050
L3	2.54	2.92	0.100	0.115

TO-220 (IXCP) Outline



Pins: 1 - Gate 2 - Drain

SYM	INCHES MIN	MAX	MILLIMETERS MIN	MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
ØP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

Fig. 1. Output Characteristics @ T_J = 25ºC

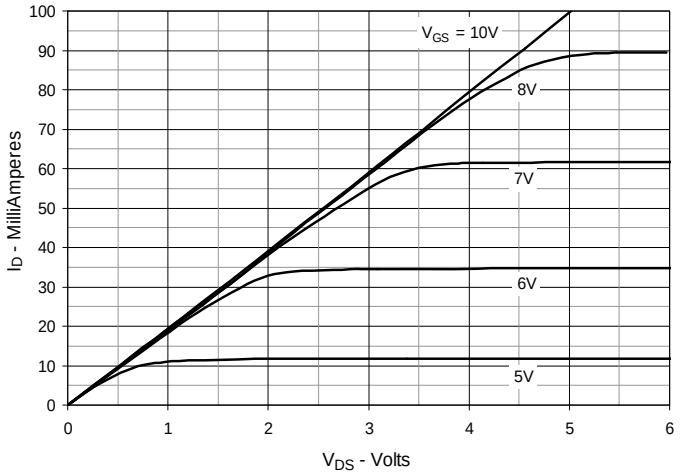


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

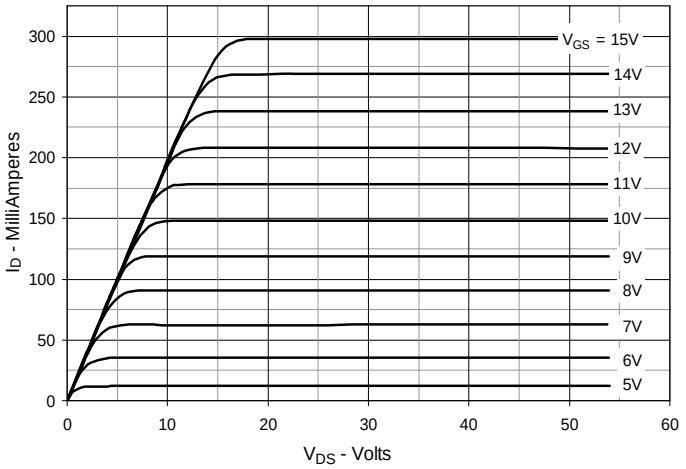


Fig. 3. Output Characteristics @ T_J = 125ºC

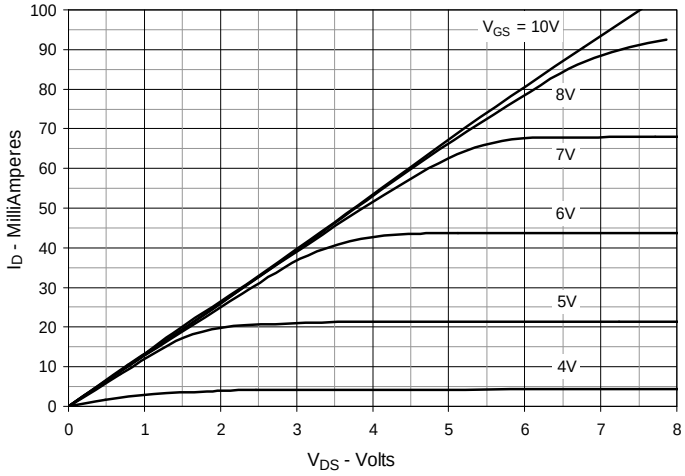


Fig. 4. Drain Current vs. Junction Temperature

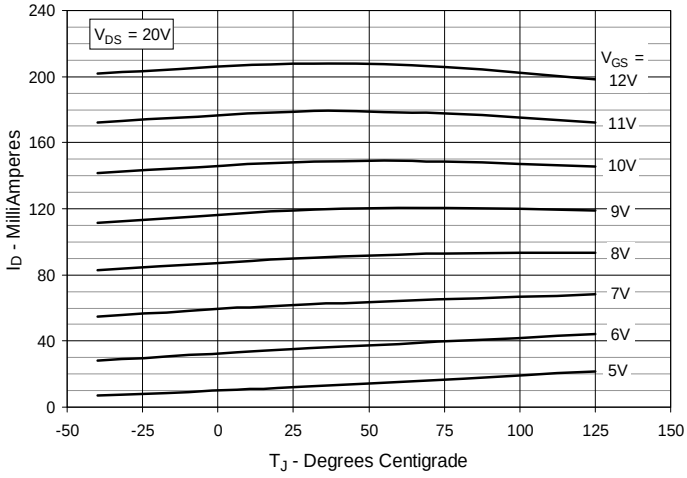


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 50mA Value vs. Junction Temperature

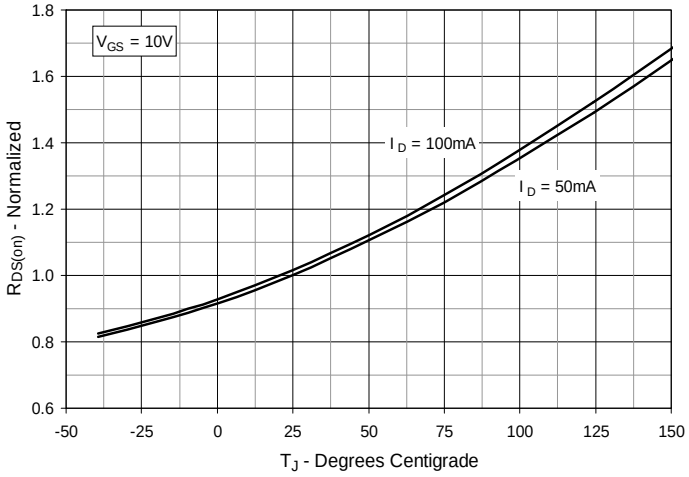


Fig. 6. $R_{DS(on)}$ Normalized to I_D = 50mA Value vs. Drain Current

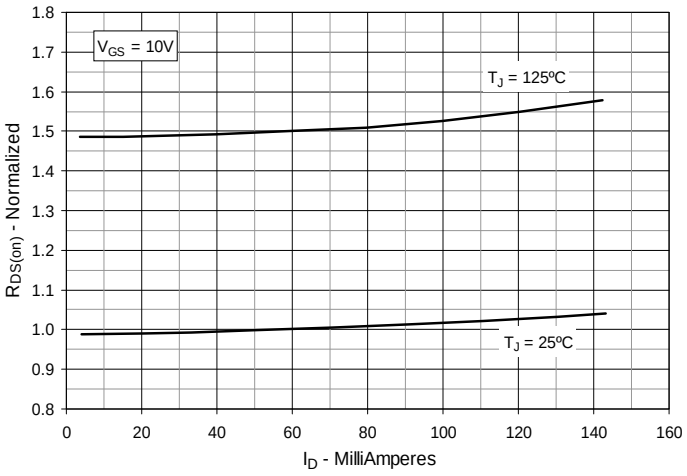


Fig. 7. Dynamic Output Resistance vs. Drain Current

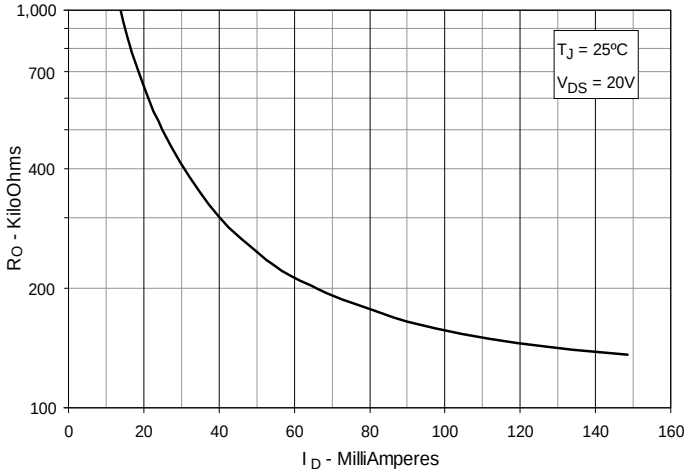


Fig. 8. Input Admittance

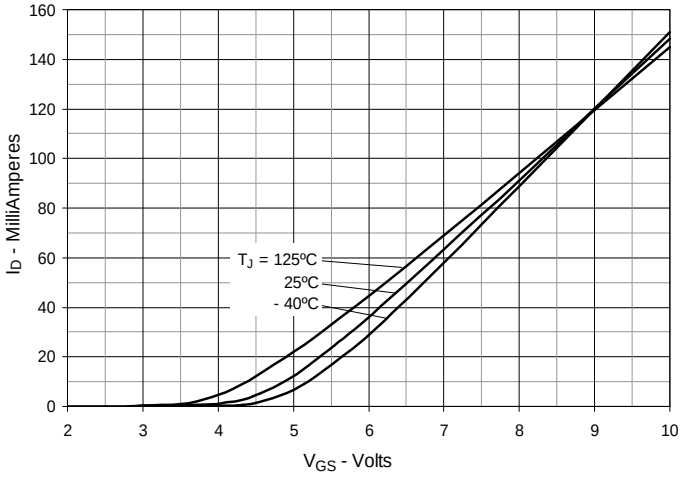


Fig. 9. Transconductance

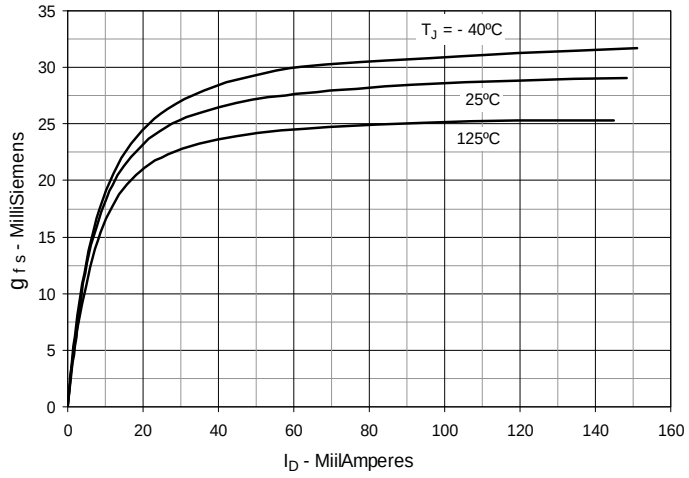


Fig. 10. Forward Voltage Drop of Intrinsic Diode

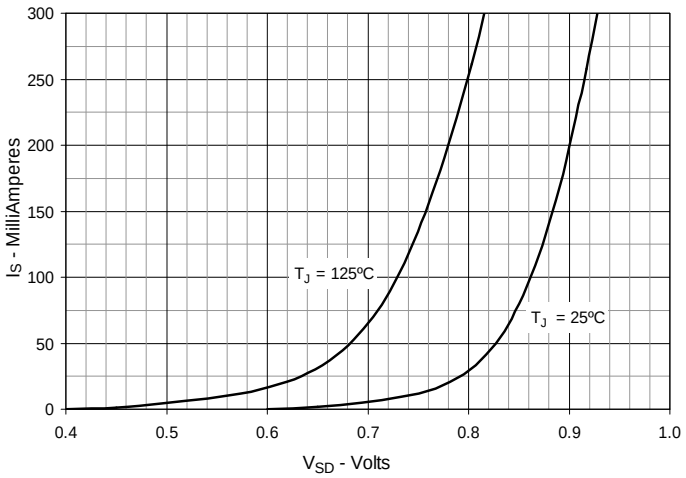


Fig. 11. Gate Charge

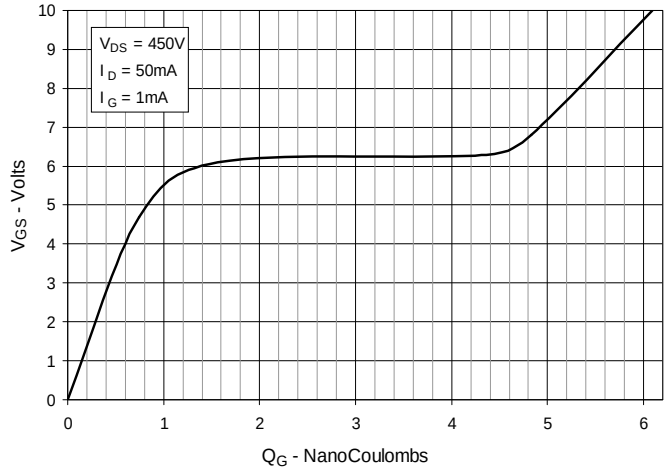


Fig. 12. Capacitance

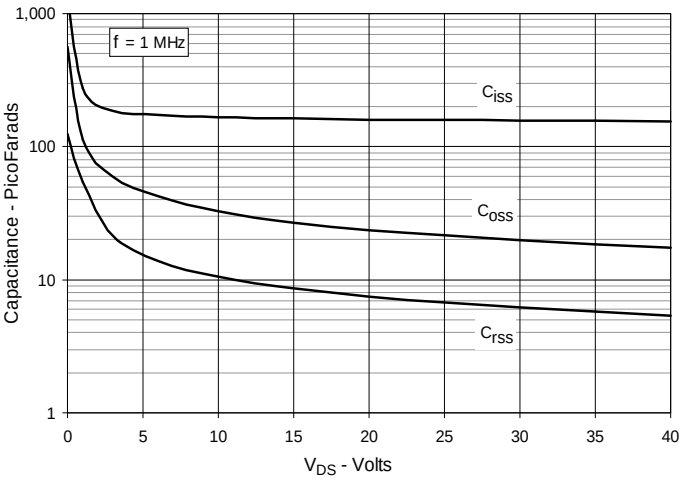


Fig. 13. Allowable Power Dissipation for Various Heat-Sinking Conditions

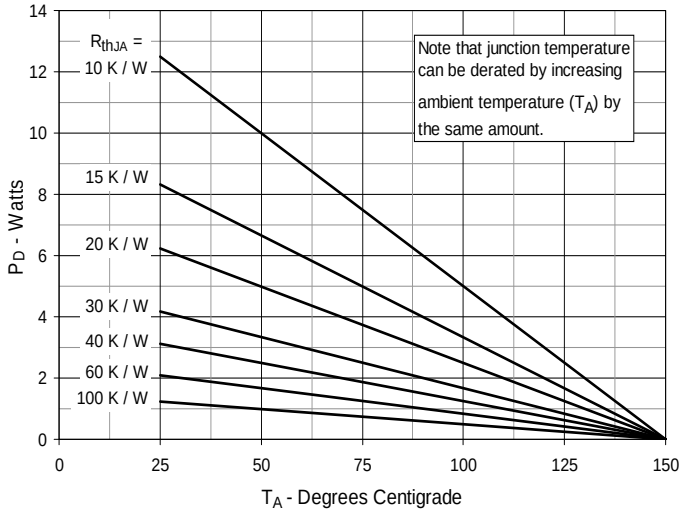


Fig. 14. Forward-Bias Safe Operating Area

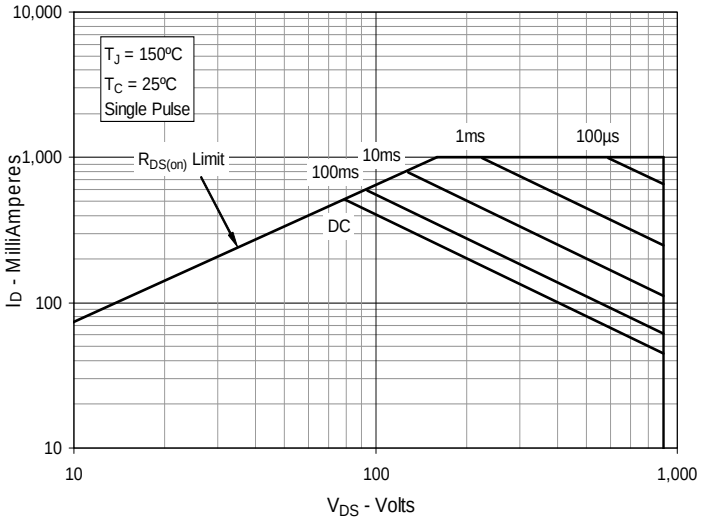


Fig. 15. Maximum Transient Thermal Impedance