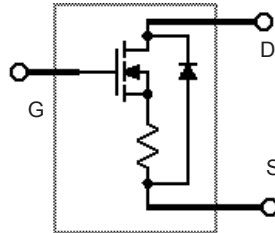


# Gate Controlled Current Limiter

**IXCP 01N90E**  
**IXCY 01N90E**

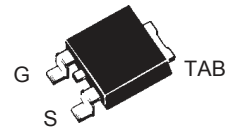
$V_{DSS} = 900 \text{ V}$   
 $I_{D(limit)} = 250 \text{ mA}$   
 $R_{DS(on)} = 80 \text{ } \Omega$

N-Channel, Enhancement Mode

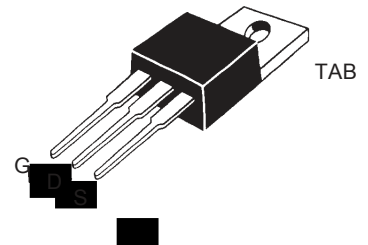


Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	900	V
$V_{DGR}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$	900	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$P_D$	$T_C = 25^\circ\text{C}$	40	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$T_L$	1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
$M_d$	Mounting torque with 3.5mm screw (TO-220)	0.55/5 Nm/lb.in.	
<b>Weight</b>		TO-251/252 = 1 g, TO-220 = 4 g	

TO-252 (IXCY)



TO-220 (IXCP)



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

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0 \text{ V}, I_D = 25 \text{ } \mu\text{A}$	900		V
$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 25 \text{ } \mu\text{A}$	2.5		V
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0$			$\pm 50 \text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}, V_{GS} = 0 \text{ V}$			$10 \text{ } \mu\text{A}$
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 50 \text{ mA}$ Pulse test, $t \leq 300 \text{ } \mu\text{s}$ , duty cycle $d \leq 2 \%$			$80 \text{ } \Omega$
$I_{DP}$	Plateau Current; $V_{DS} = 10 \text{ V}, V_{GS} = 10 \text{ V}$ Pulse test, $t \leq 300 \text{ } \mu\text{s}$ , duty cycle $d \leq 2 \%$	100		$130 \text{ mA}$

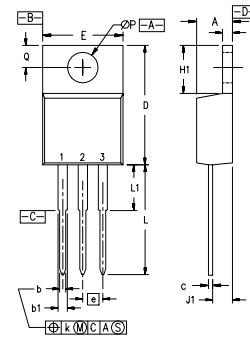
## Features

- High output resistance in the saturated mode of operation
- Rugged HDMOS™ process
- Stable peak drain current limit
- High voltage current regulator
- International standard packages

## Applications

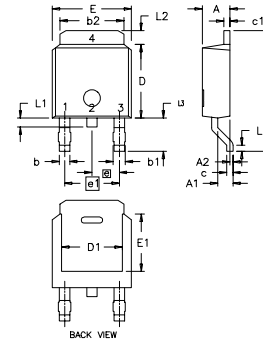
- Current regulation
- Over current and over voltage protection for sensitive loads
- Linear regulator

Symbol	Test Conditions	Characteristic Values (T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
<b>g<sub>fs</sub></b>	V <sub>DS</sub> = 20 V; I <sub>D</sub> = 100 mA, pulse test			40 mS
<b>C<sub>iss</sub></b> <b>C<sub>oss</sub></b> <b>C<sub>rss</sub></b>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		133	pF
			24	pF
			6.6	pF
<b>t<sub>d(on)</sub></b> <b>t<sub>r</sub></b> <b>t<sub>d(off)</sub></b> <b>t<sub>f</sub></b>	V <sub>DS</sub> = 500 V, I <sub>D</sub> = 50 mA V <sub>GS</sub> = 10 V, R <sub>G</sub> = 50 Ω (External)		15	ns
			137	ns
			11	ns
			131	ns
<b>Q<sub>g(on)</sub></b> <b>Q<sub>gs</sub></b> <b>Q<sub>gd</sub></b>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 500 V, I <sub>D</sub> = 50 mA		7.5	nC
			2.2	nC
			3.0	nC
<b>ΔI<sub>A(P)</sub>/ΔT</b>	Plateau Current Shift with Temperature V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 10 V		±50	ppm/K
<b>ΔV<sub>AK</sub>/ΔI<sub>A(P)</sub></b>	Dynamic Resistance V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 10 V	125		kΩ
<b>V<sub>F</sub></b>	I <sub>F</sub> = 50mA			1.8 V
<b>R<sub>thJC</sub></b> <b>R<sub>thCA</sub></b>				3.1 K/W
	TO-220	80		K/W
	TO-251/252	100		K/W

**TO-220 AB Dimensions**


Pins: 1 - Gate  
2 - Drain  
3 - Source  
4 - Drain  
Bottom Side

SYM	INCHES		MILLIMETERS	
	MIN	MAX	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
∅P	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

**TO-252 AA Outline**


Dim.	Millimeter		Inches	
	Min.	Max.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

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

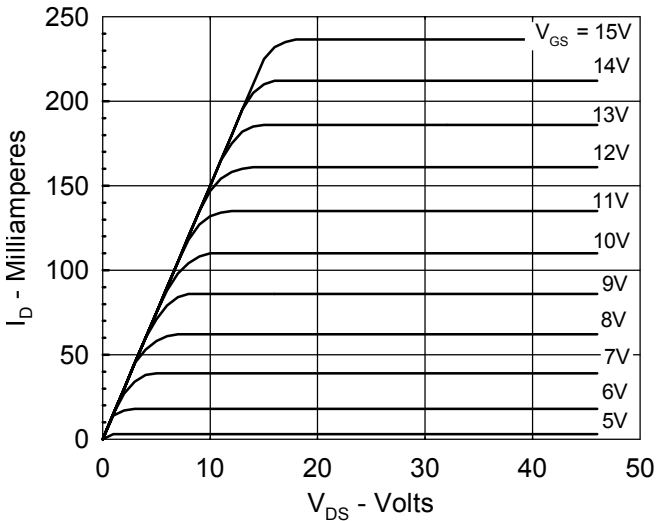


Figure 1, Output Characteristics at 25°C

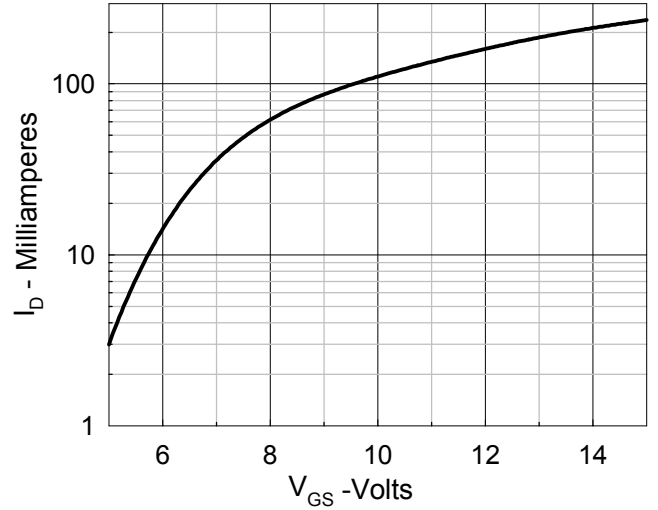


Figure 2. Drain Current vs. Gate Voltage

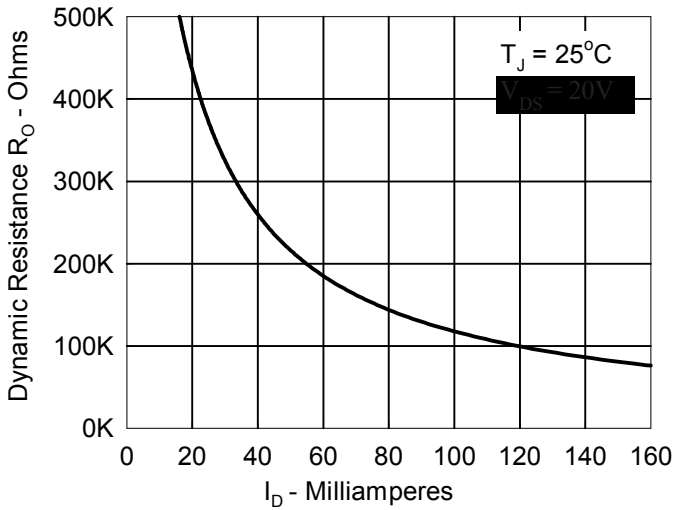


Figure 3. Dynamic Output Resistance  $R_O$  vs. Drain Current.

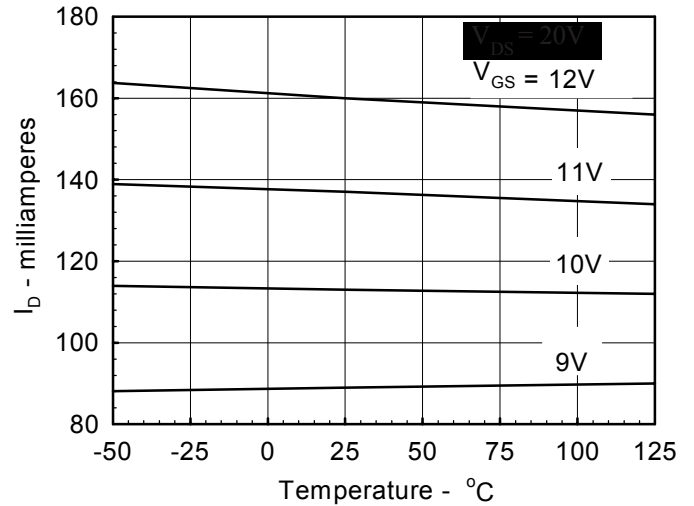


Figure 4. Drain Current vs. Temperature for a constant gate-source voltage.

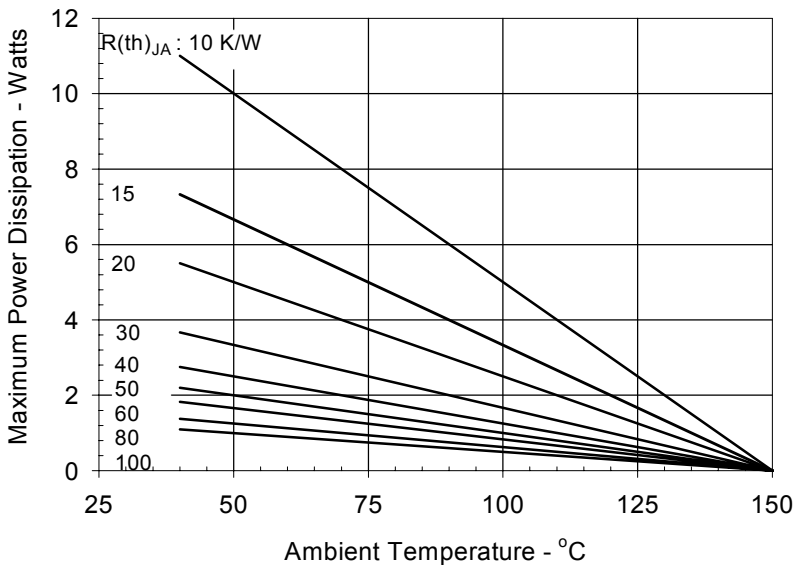


Figure 5. Allowable Power Dissipation for various heat sinking conditions. Note that the junction temperature can be derated by increasing the ambient temperature a like amount.