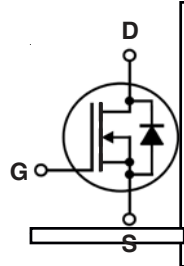


# Depletion Mode MOSFET

**IXTY08N100D2**  
**IXTA08N100D2**  
**IXTP08N100D2**

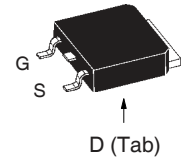
$V_{DSX} = 1000V$   
 $I_{D(on)} \geq 800mA$   
 $R_{DS(on)} \leq 21\Omega$

## N-Channel

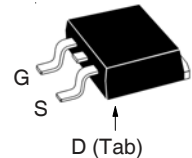


Symbol	Test Conditions	Maximum Ratings	
$V_{DSX}$	$T_J = 25^\circ C$ to $150^\circ C$	1000	V
$V_{GSX}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$P_D$	$T_C = 25^\circ C$	60	W
$T_J$		- 55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		- 55 ... +150	$^\circ C$
$T_L$	Maximum Lead Temperature for Soldering	300	$^\circ C$
$T_{SOLD}$	1.6 mm (0.062in.) from Case for 10s	260	$^\circ C$
$M_d$	Mounting Torque (TO-220)	1.13 / 10	Nm/lb.in.
Weight	TO-252	0.35	g
	TO-263	2.50	g
	TO-220	3.00	g

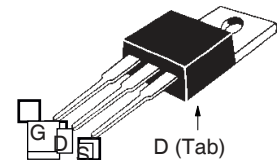
### TO-252 (IXTY)



### TO-263 AA (IXTA)



### TO-220AB (IXTP)



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

Symbol	Test Conditions ( $T_J = 25^\circ C$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSX}$	$V_{GS} = -5V, I_D = 25\mu A$	1000		V
$V_{GS(off)}$	$V_{DS} = 25V, I_D = 25\mu A$	- 2.0		V
$I_{GSX}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 50$ nA
$I_{DSX(off)}$	$V_{DS} = V_{DSX}, V_{GS} = -5V$ $T_J = 125^\circ C$			1 $\mu A$ 15 $\mu A$
$R_{DS(on)}$	$V_{GS} = 0V, I_D = 400mA, \text{ Note 1}$			21 $\Omega$
$I_{D(on)}$	$V_{GS} = 0V, V_{DS} = 50V, \text{ Note 1}$	800		mA

### Features

- Normally ON Mode
- International Standard Packages
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

### Applications

- Audio Amplifiers
- Start-up Circuits
- Protection Circuits
- Ramp Generators
- Current Regulators
- Active Loads

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 30\text{V}$ , $I_D = 400\text{mA}$ , Note 1	330	560	mS
$C_{iss}$	$V_{GS} = -10\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$		325	pF
$C_{oss}$			24	pF
$C_{rss}$			6.5	pF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = \pm 5\text{V}$ , $V_{DS} = 500\text{V}$ , $I_D = 400\text{mA}$ $R_G = 10\Omega$ (External)		28	ns
$t_r$			57	ns
$t_{d(off)}$			34	ns
$t_f$			48	ns
$Q_{g(on)}$	$V_{GS} = 5\text{V}$ , $V_{DS} = 500\text{V}$ , $I_D = 400\text{mA}$		14.6	nC
$Q_{gs}$			1.2	nC
$Q_{gd}$			8.3	nC
$R_{thJC}$	TO-220			2.08 $^\circ\text{C/W}$
$R_{thCS}$			0.50	$^\circ\text{C/W}$

**Safe-Operating-Area Specification**

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
SOA	$V_{DS} = 800\text{V}$ , $I_D = 45\text{mA}$ , $T_C = 75^\circ\text{C}$ , $T_p = 5\text{s}$	36		W

**Source-Drain Diode**

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_{SD}$	$I_F = 800\text{mA}$ , $V_{GS} = -10\text{V}$ , Note 1		0.8	1.3 V
$t_{rr}$	$I_F = 800\text{mA}$ , $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$ , $V_{GS} = -10\text{V}$		1.03	$\mu\text{s}$
$I_{RM}$			7.40	A
$Q_{RM}$			3.80	$\mu\text{C}$

Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

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	7,005,734 B2	7,157,338B2
4,860,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

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

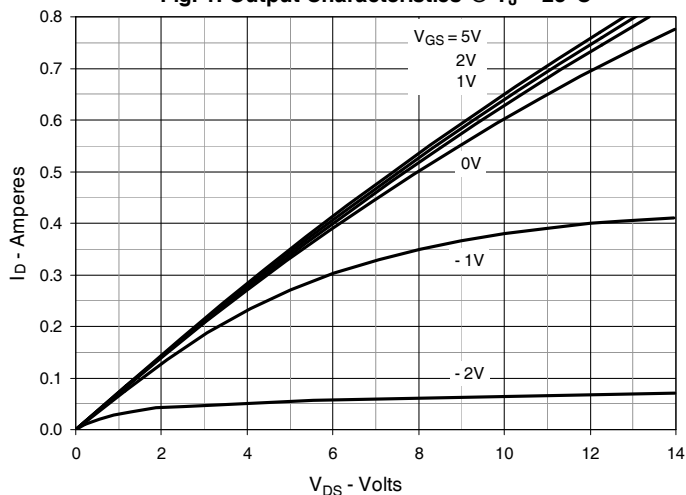


Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$

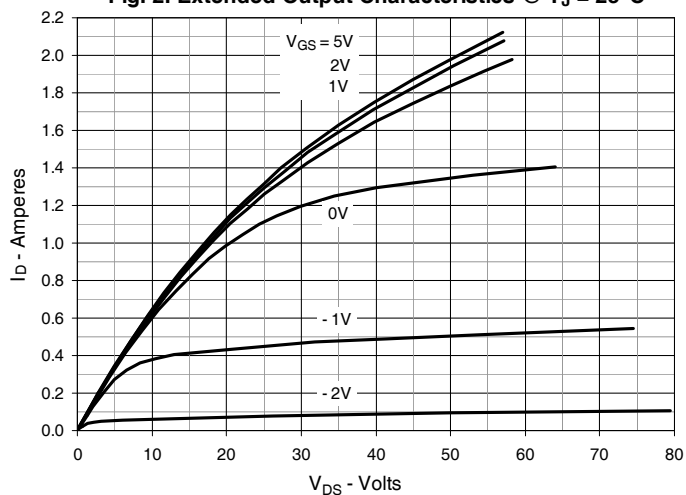


Fig. 3. Output Characteristics @  $T_J = 125^\circ\text{C}$

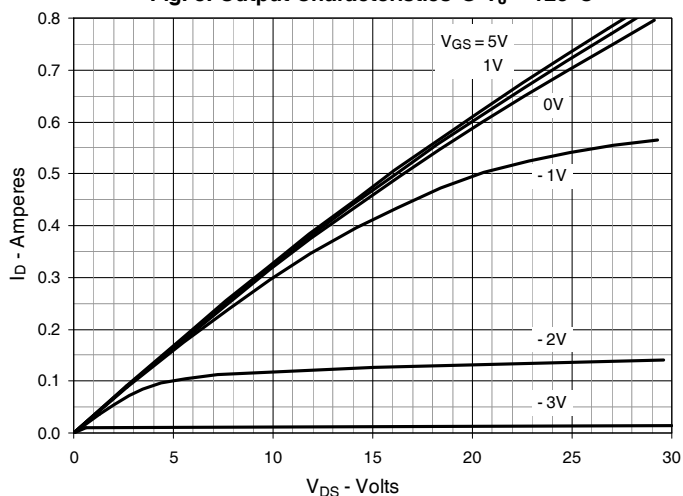


Fig. 4. Drain Current @  $T_J = 25^\circ\text{C}$

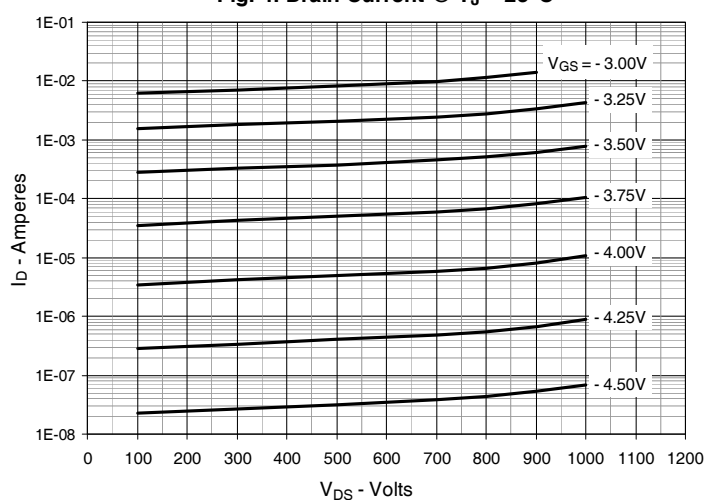


Fig. 5. Drain Current @  $T_J = 100^\circ\text{C}$

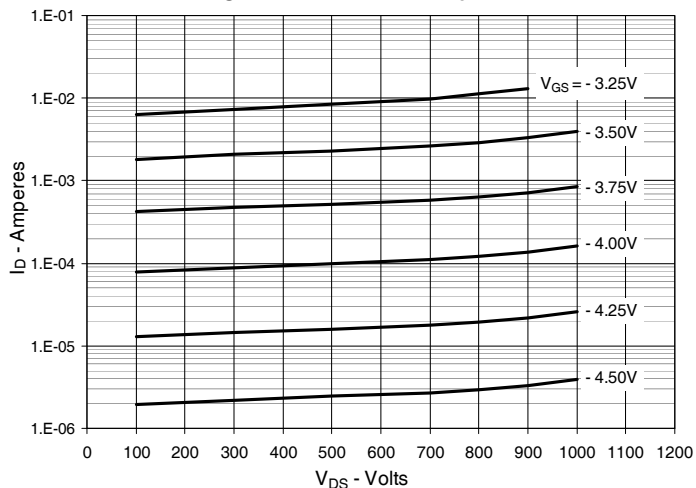


Fig. 6. Dynamic Resistance vs. Gate Voltage

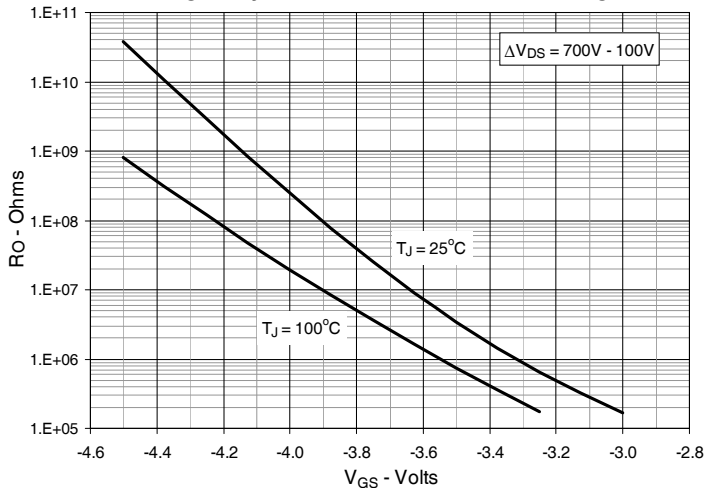


Fig. 7. Normalized  $R_{DS(on)}$  vs. Junction Temperature

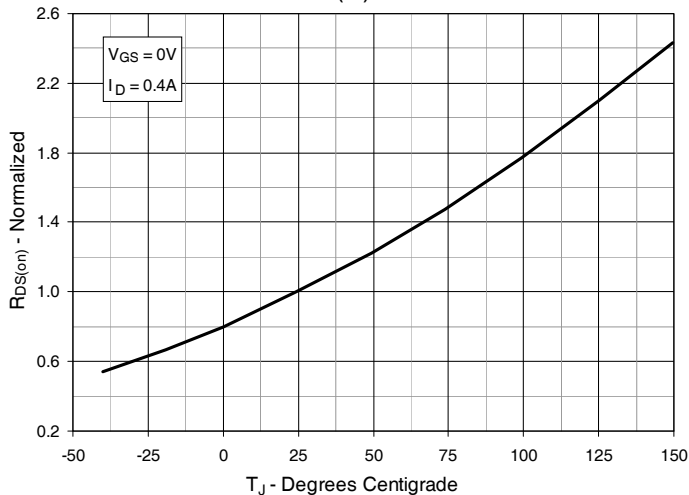


Fig. 8.  $R_{DS(on)}$  Normalized to  $I_D = 0.4A$  Value vs. Drain Current

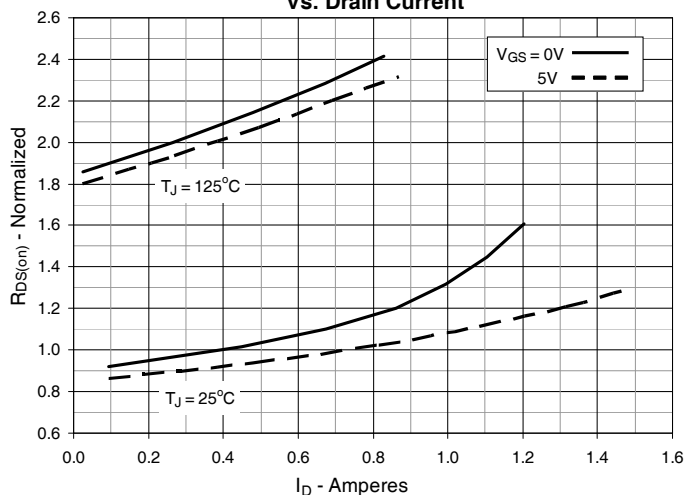


Fig. 9. Input Admittance

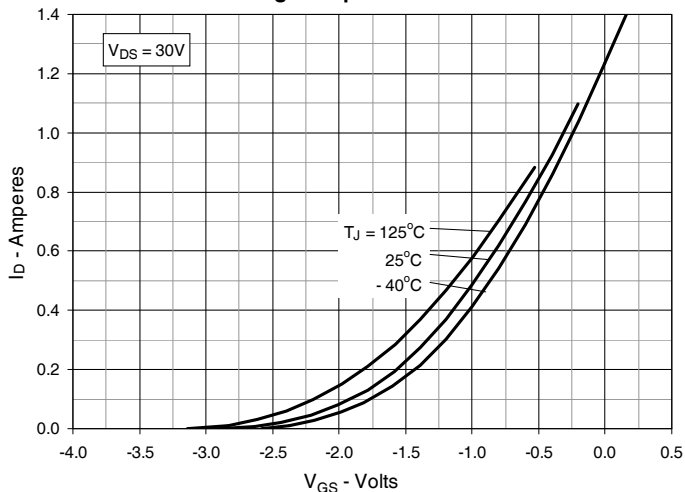


Fig. 10. Transconductance

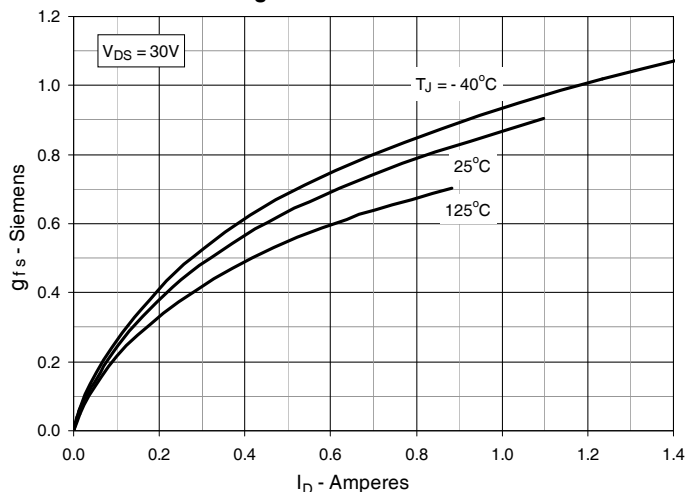


Fig. 11. Breakdown and Threshold Voltages vs. Junction Temperature

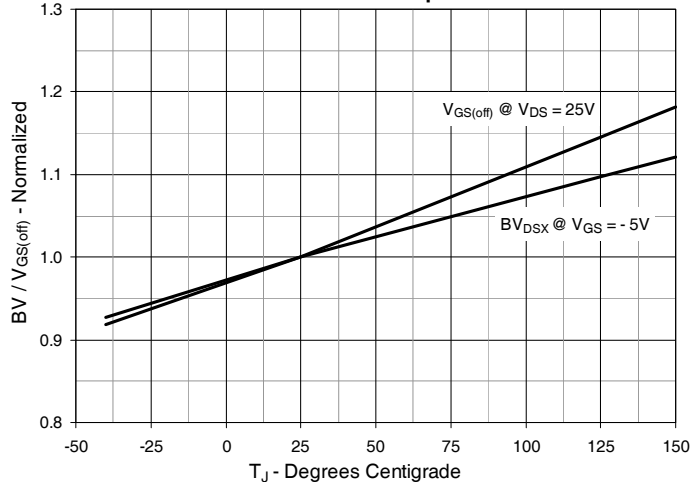


Fig. 12. Forward Voltage Drop of Intrinsic Diode

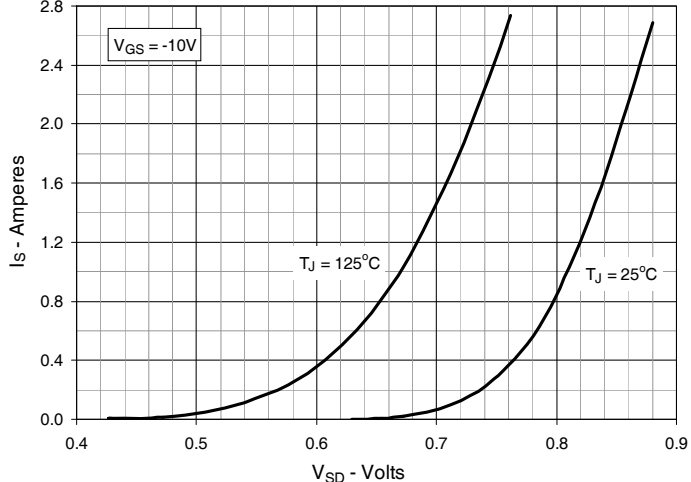


Fig. 13. Capacitance

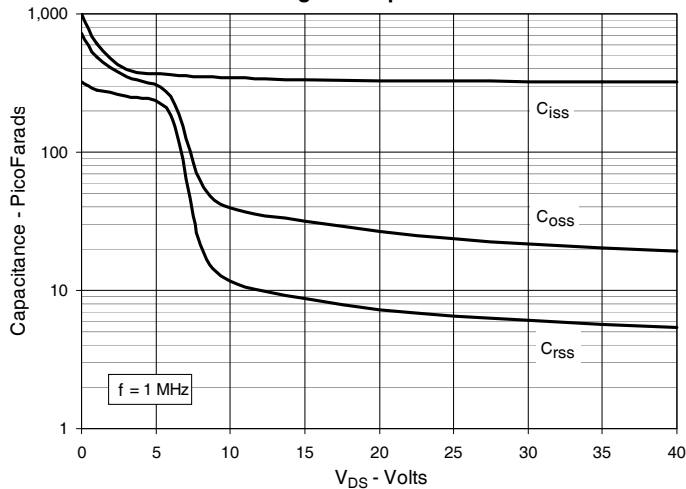


Fig. 14. Gate Charge

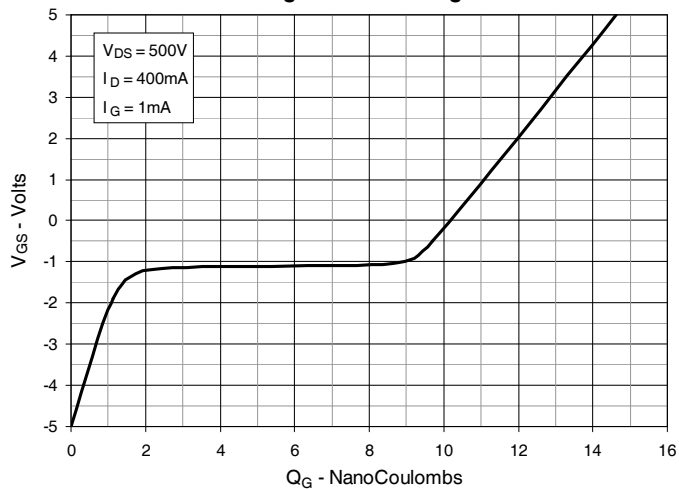


Fig. 15. Forward-Bias Safe Operating Area @ T<sub>C</sub> = 25°C

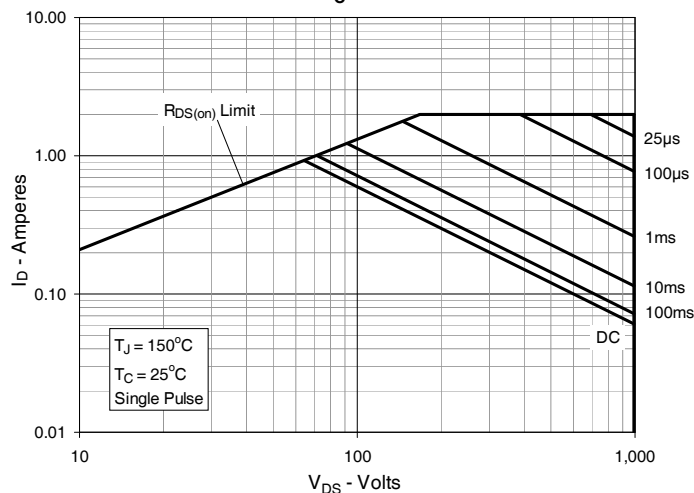


Fig. 16. Forward-Bias Safe Operating Area @ T<sub>C</sub> = 75°C

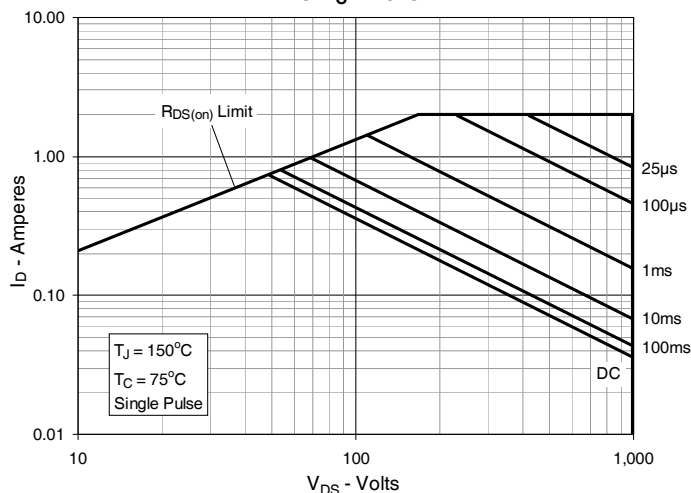
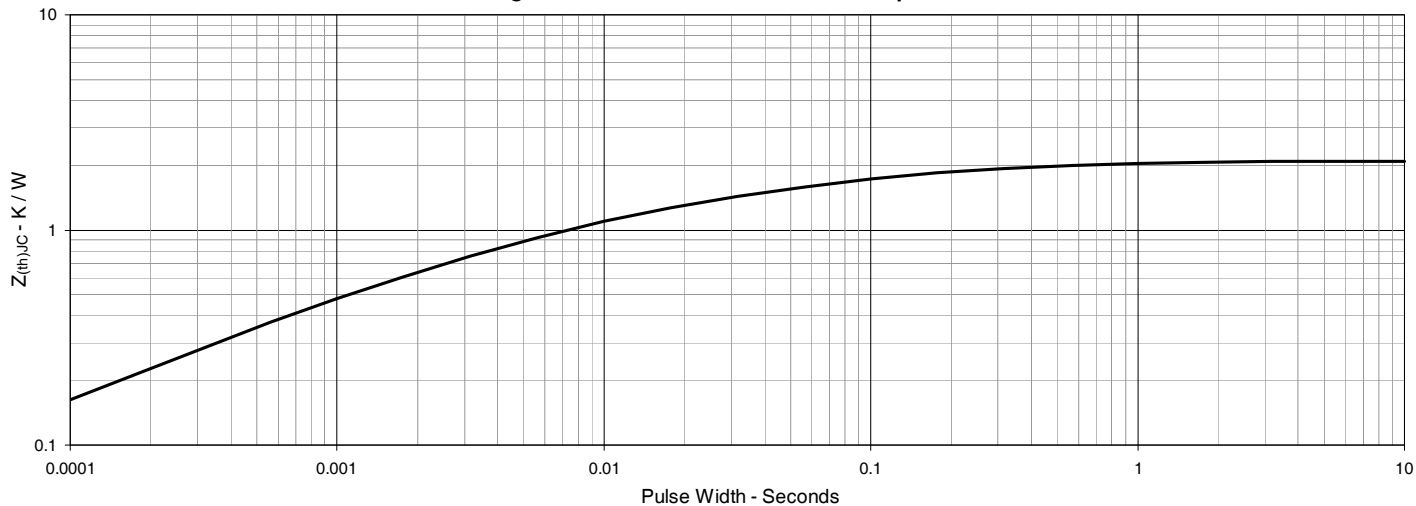
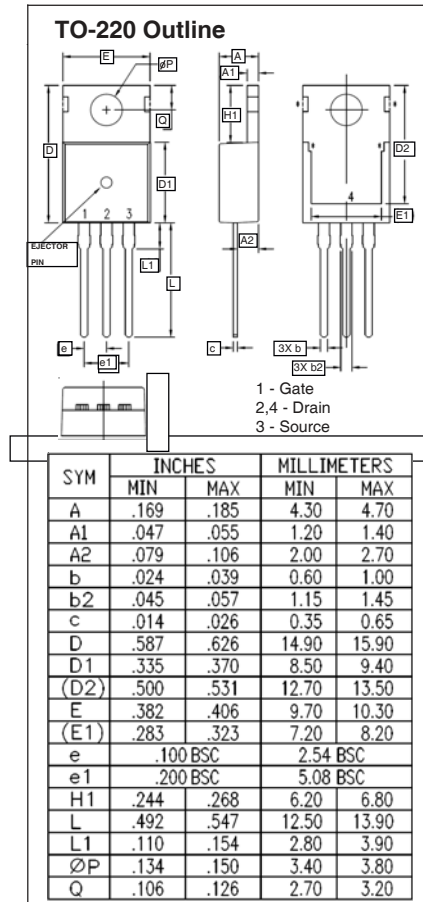
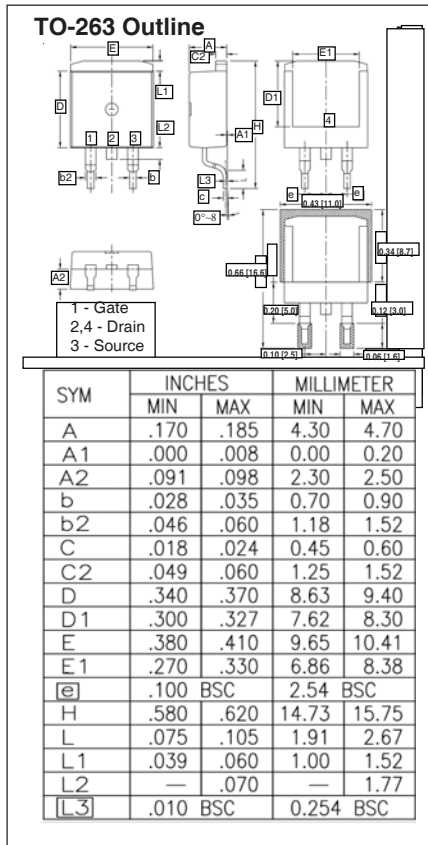
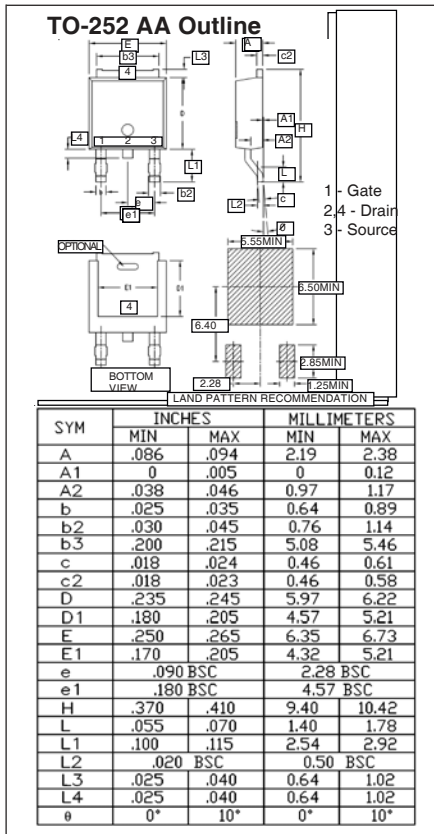


Fig. 17. Maximum Transient Thermal Impedance







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