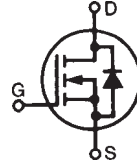


# TrenchT2™ Power MOSFET

## IXTA260N055T2-7

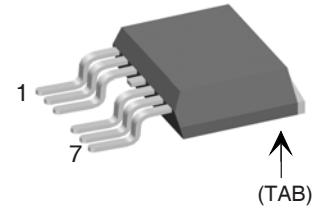
$$\begin{aligned} V_{DSS} &= 55V \\ I_{D25} &= 260A \\ R_{DS(on)} &\leq 3.3m\Omega \end{aligned}$$

N-Channel Enhancement Mode  
Avalanche Rated



TO-263 (7-lead)

| Symbol     | Test Conditions                                                   | Maximum Ratings |                  |
|------------|-------------------------------------------------------------------|-----------------|------------------|
| $V_{DSS}$  | $T_J = 25^\circ\text{C to } 175^\circ\text{C}$                    | 55              | V                |
| $V_{DGR}$  | $T_J = 25^\circ\text{C to } 175^\circ\text{C}, R_{GS} = 1M\Omega$ | 55              | V                |
| $V_{GSM}$  | Transient                                                         | $\pm 20$        | V                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$                                          | 260             | A                |
| $I_{LRMS}$ | Lead Current Limit, RMS                                           | 160             | A                |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$        | 780             | A                |
| $I_A$      | $T_C = 25^\circ\text{C}$                                          | 100             | A                |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$                                          | 600             | mJ               |
| $P_D$      | $T_C = 25^\circ\text{C}$                                          | 480             | W                |
| $T_J$      |                                                                   | -55 ... +175    | $^\circ\text{C}$ |
| $T_{JM}$   |                                                                   | 175             | $^\circ\text{C}$ |
| $T_{stg}$  |                                                                   | -55 ... +175    | $^\circ\text{C}$ |
| $T_L$      | 1.6mm (0.062in.) from case for 10s                                | 300             | $^\circ\text{C}$ |
| $T_{sold}$ | Plastic body for 10 seconds                                       | 260             | $^\circ\text{C}$ |
| Weight     |                                                                   | 3               | g                |



Pins: 1 - Gate  
2, 3 - Source  
5, 6, 7 - Source  
TAB (8) - Drain

### Features

- International standard package
- 175°C Operating Temperature
- High current handling capability
- Avalanche rated
- Low  $R_{DS(on)}$

### Advantages

- Easy to mount
- Space savings
- High power density

### Applications

- Automotive
  - Motor Drives
  - 12V Battery
  - ABS Systems
- DC/DC Converters and Off-line UPS
- Primary- Side Switch
- High Current Switching Applications

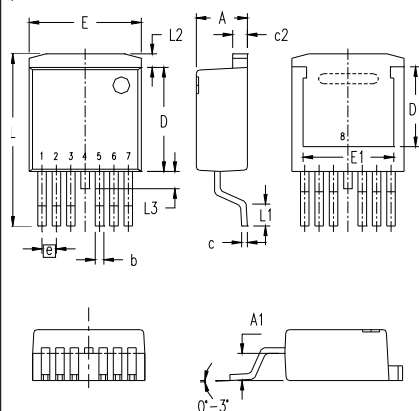
| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ unless otherwise specified) | Characteristic Values |      |               |
|--------------|---------------------------------------------------------------------------|-----------------------|------|---------------|
|              |                                                                           | Min.                  | Typ. | Max.          |
| $BV_{DSS}$   | $V_{GS} = 0V, I_D = 250\mu A$                                             | 55                    |      | V             |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$                                         | 2.0                   |      | 4.0 V         |
| $I_{GSS}$    | $V_{GS} = \pm 20V, V_{DS} = 0V$                                           |                       |      | $\pm 200$ nA  |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$                                                        |                       |      | 5 $\mu A$     |
|              | $V_{GS} = 0V, T_J = 150^\circ\text{C}$                                    |                       |      | 150 $\mu A$   |
| $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 50A$ , Notes 1, 2                                    |                       |      | 3.3 $m\Omega$ |

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified)                                                                  | Characteristic Values |      |                         |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|-------------------------|
|              |                                                                                                                                              | Min.                  | Typ. | Max.                    |
| $g_{fs}$     | $V_{DS} = 10\text{V}$ , $I_D = 60\text{A}$ , Note 1                                                                                          | 55                    | 94   | S                       |
| $C_{iss}$    | $V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$                                                                             |                       | 10.8 | nF                      |
| $C_{oss}$    |                                                                                                                                              |                       | 1460 | pF                      |
| $C_{rss}$    |                                                                                                                                              |                       | 215  | pF                      |
| $t_{d(on)}$  | <b>Resistive Switching Times</b><br>$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 100\text{A}$<br>$R_G = 2\Omega$ (External) |                       | 20   | ns                      |
| $t_r$        |                                                                                                                                              |                       | 27   | ns                      |
| $t_{d(off)}$ |                                                                                                                                              |                       | 36   | ns                      |
| $t_f$        |                                                                                                                                              |                       | 24   | ns                      |
| $Q_{g(on)}$  | $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$                                                             |                       | 140  | nC                      |
| $Q_{gs}$     |                                                                                                                                              |                       | 52   | nC                      |
| $Q_{gd}$     |                                                                                                                                              |                       | 32   | nC                      |
| $R_{thJC}$   |                                                                                                                                              |                       |      | 0.31 $^\circ\text{C/W}$ |

## Source-Drain Diode

| Symbol   | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified)                            | Characteristic Values |      |        |
|----------|--------------------------------------------------------------------------------------------------------|-----------------------|------|--------|
|          |                                                                                                        | Min.                  | Typ. | Max.   |
| $I_S$    | $V_{GS} = 0\text{V}$                                                                                   |                       |      | 260 A  |
| $I_{SM}$ | Repetitive, Pulse width limited by $T_{JM}$                                                            |                       |      | 1000 A |
| $V_{SD}$ | $I_F = 100\text{A}$ , $V_{GS} = 0\text{V}$ , Note 1                                                    |                       |      | 1.3 V  |
| $t_{rr}$ | $I_F = 130\text{A}$ , $V_{GS} = 0\text{V}$<br>$-di/dt = 100\text{A}/\mu\text{s}$<br>$V_R = 27\text{V}$ |                       | 60   | ns     |
| $I_{RM}$ |                                                                                                        |                       | 3.4  | A      |
| $Q_{RM}$ |                                                                                                        |                       | 102  | nC     |

## TO-263 (7-lead) (IXTA..7) Outline



Pins: 1 - Gate  
2, 3 - Source  
4 - Drain  
5,6,7 - Source  
Tab (8) - Drain

| SYM | INCHES   |      | MILLIMETER |       |
|-----|----------|------|------------|-------|
|     | MIN      | MAX  | MIN        | MAX   |
| A   | .170     | .185 | 4.30       | 4.70  |
| A1  | .085     | .104 | 2.15       | 2.65  |
| b   | .026     | .035 | 0.65       | 0.90  |
| c   | .016     | .024 | 0.40       | 0.60  |
| c2  | .049     | .055 | 1.25       | 1.40  |
| D   | .355     | .370 | 9.00       | 9.40  |
| D1  | .272     | .280 | 6.90       | 7.10  |
| E   | .386     | .402 | 9.80       | 10.20 |
| E1  | .311     | .319 | 7.90       | 8.10  |
| e   | .050 BSC |      | 1.27 BSC   |       |
| L   | .591     | .614 | 15.00      | 15.60 |
| L1  | .091     | .110 | 2.30       | 2.80  |
| L2  | .039     | .059 | 1.00       | 1.50  |
| L3  | .000     | .059 | 0.00       | 1.50  |

- Notes: 1. Pulse test,  $t \leq 300\mu\text{s}$ ; duty cycle,  $d \leq 2\%$ .  
2. On through-hole packages,  $R_{DS(on)}$  Kelvin test contact location must be 5mm or less from the package body.

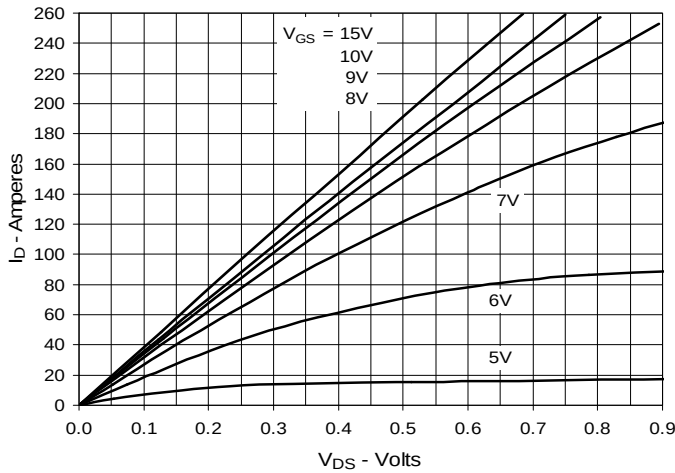
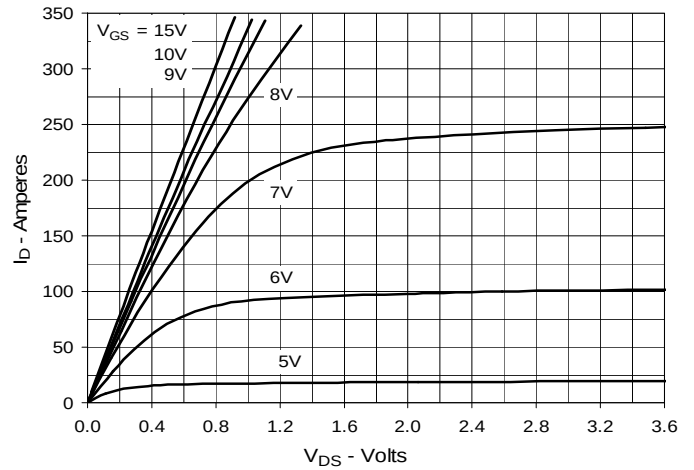
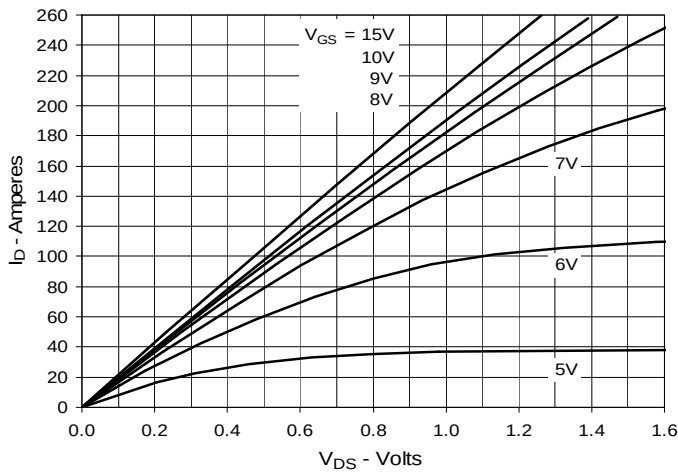
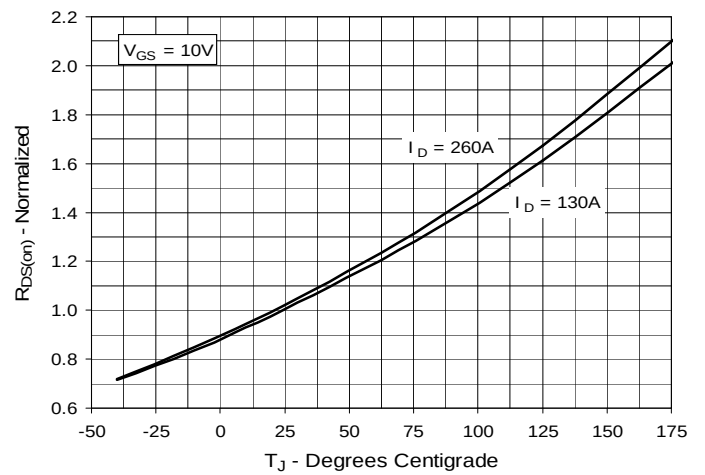
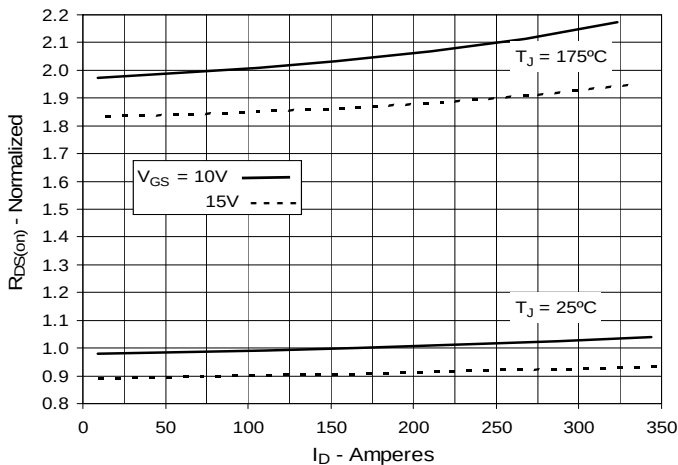
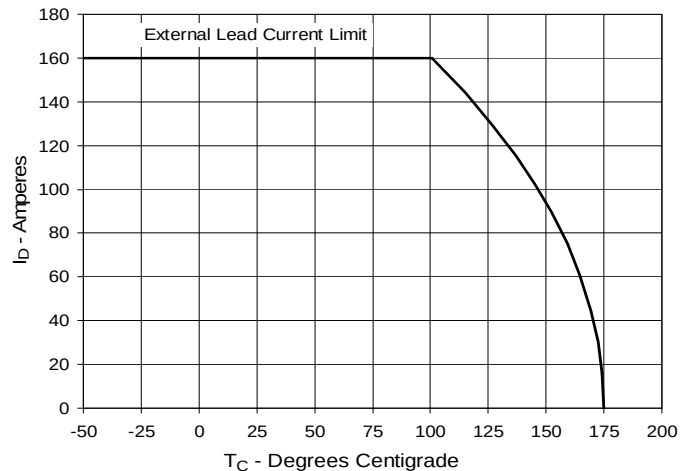
## PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

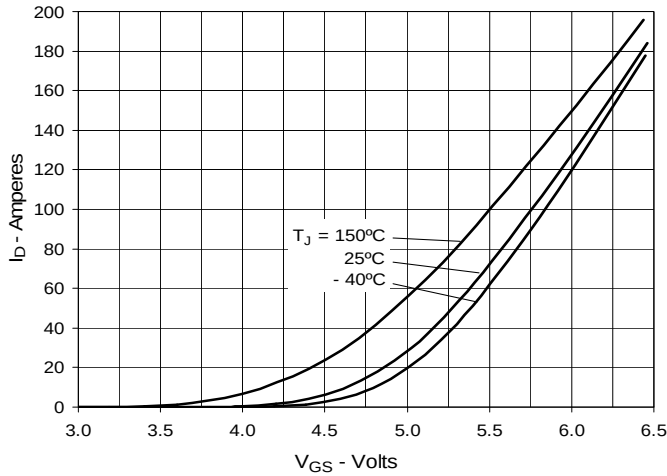
IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

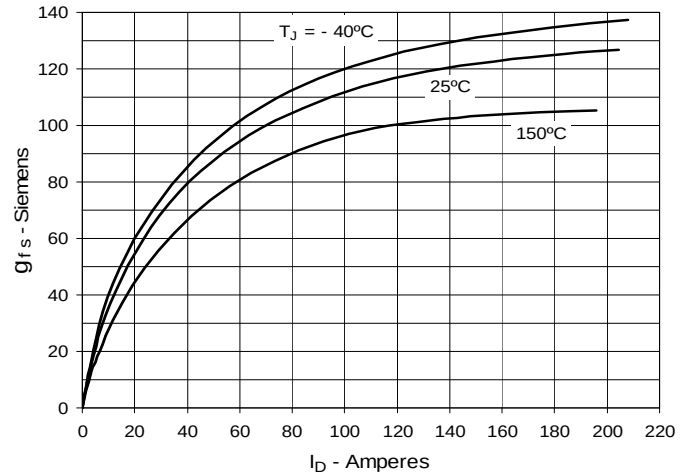
|           |           |           |           |              |              |              |              |              |             |
|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|
| 4,835,592 | 4,931,844 | 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 |
| 4,850,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343    | 6,710,405 B2 | 6,759,692    | 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  
@ 25°C**

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

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

**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 130A$  Value  
vs. Junction Temperature**

**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 130A$  Value  
vs. Drain Current**

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


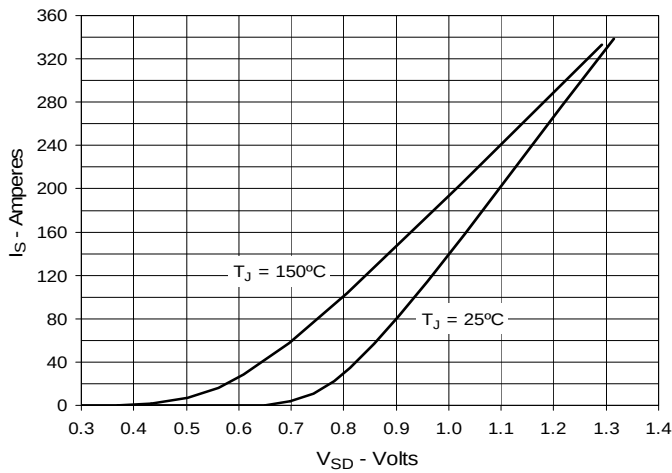
**Fig. 7. Input Admittance**



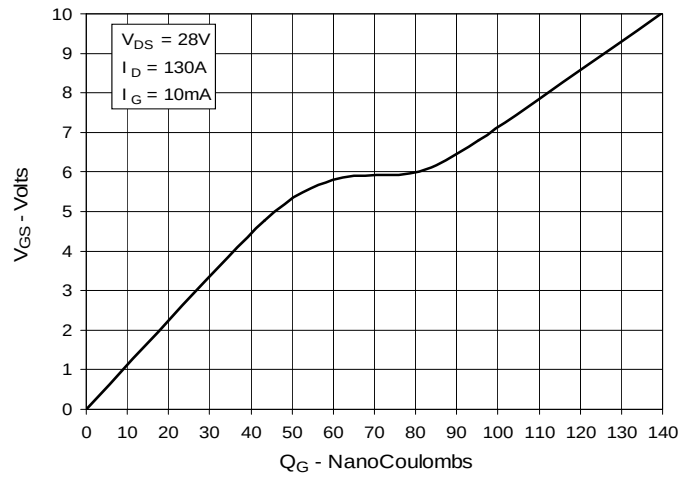
**Fig. 8. Transconductance**



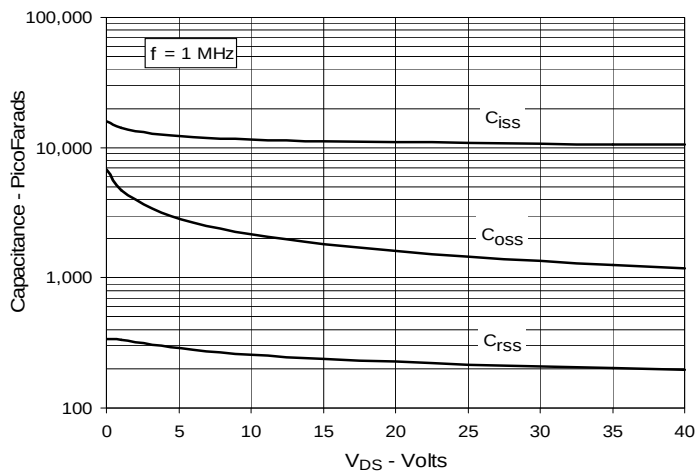
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



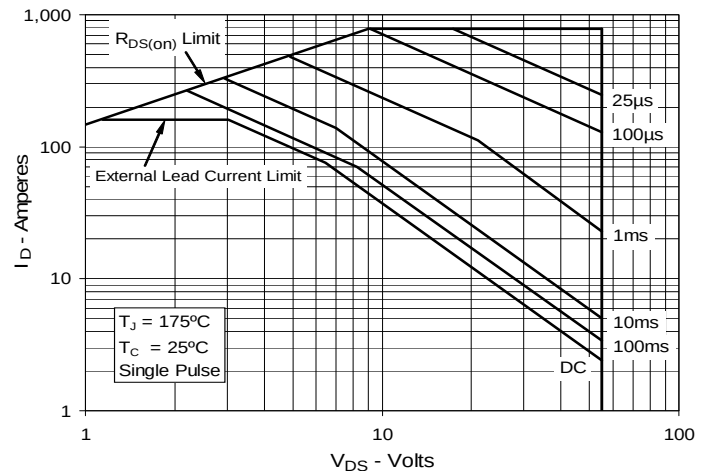
**Fig. 10. Gate Charge**



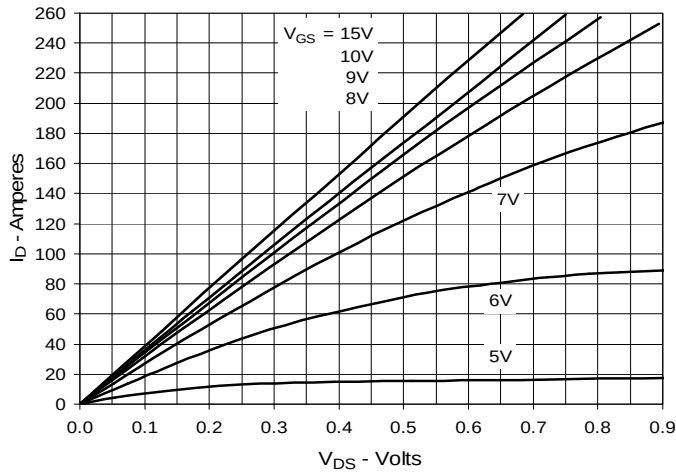
**Fig. 11. Capacitance**



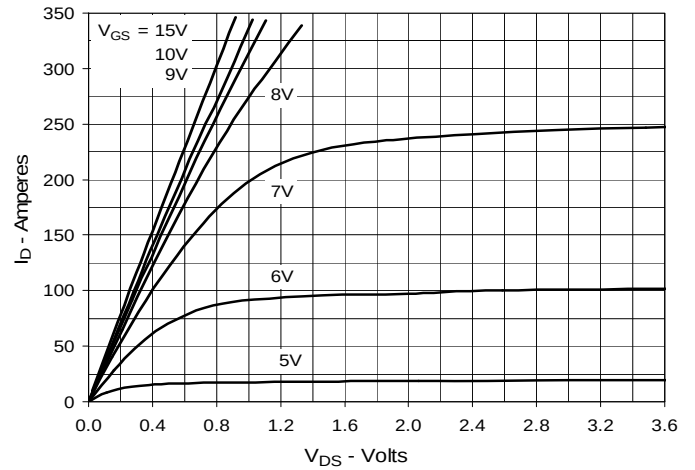
**Fig. 12. Forward-Bias Safe Operating Area**



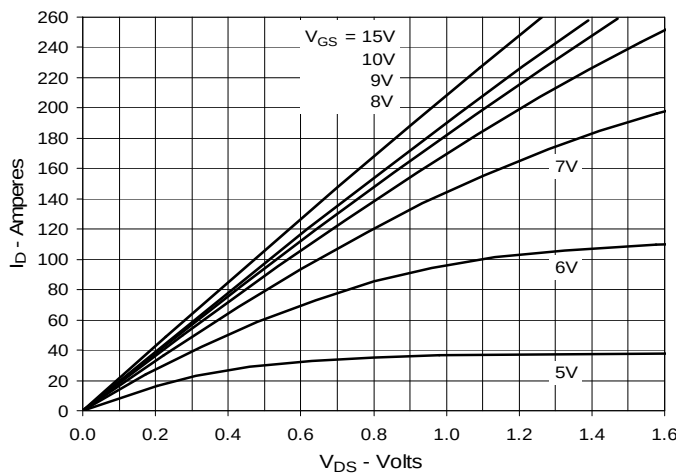
**Fig. 1. Output Characteristics  
@ 25°C**



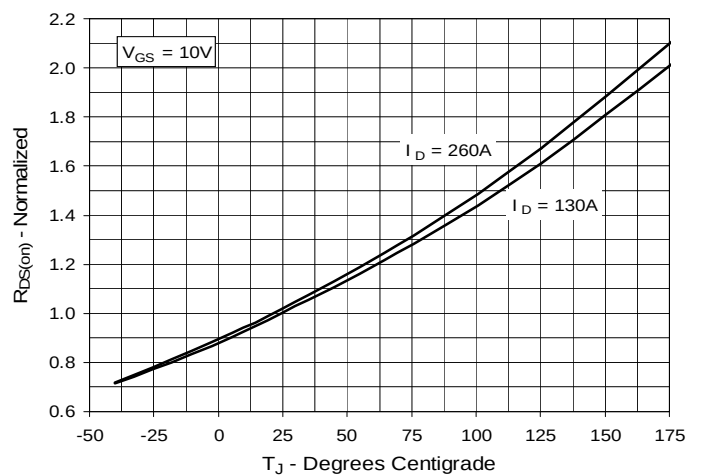
**Fig. 2. Extended Output Characteristics  
@ 25°C**



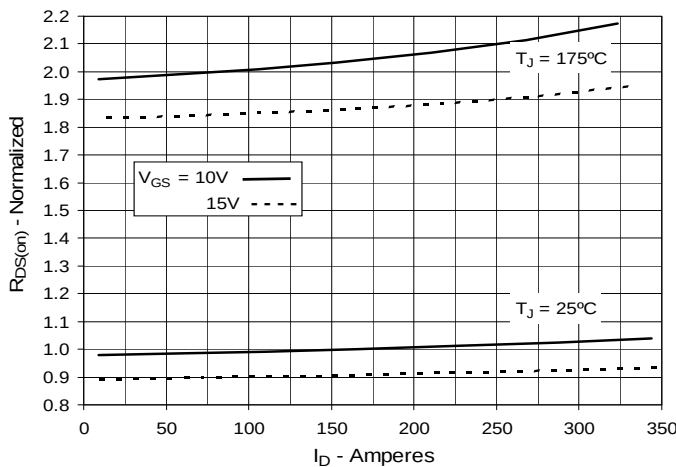
**Fig. 3. Output Characteristics  
@ 150°C**



**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 130A$  Value  
vs. Junction Temperature**



**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 130A$  Value  
vs. Drain Current**



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

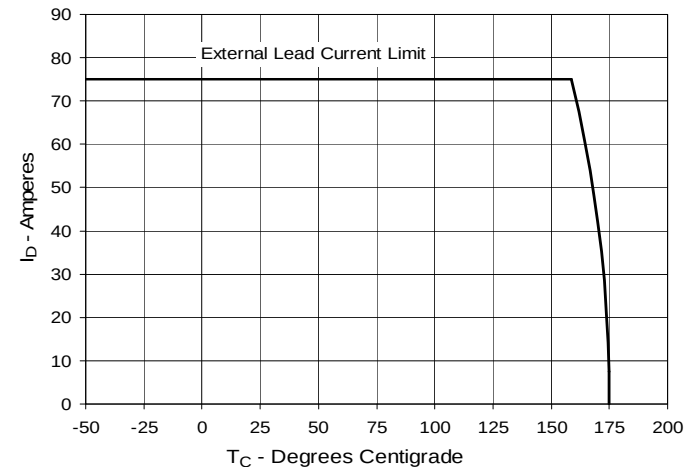
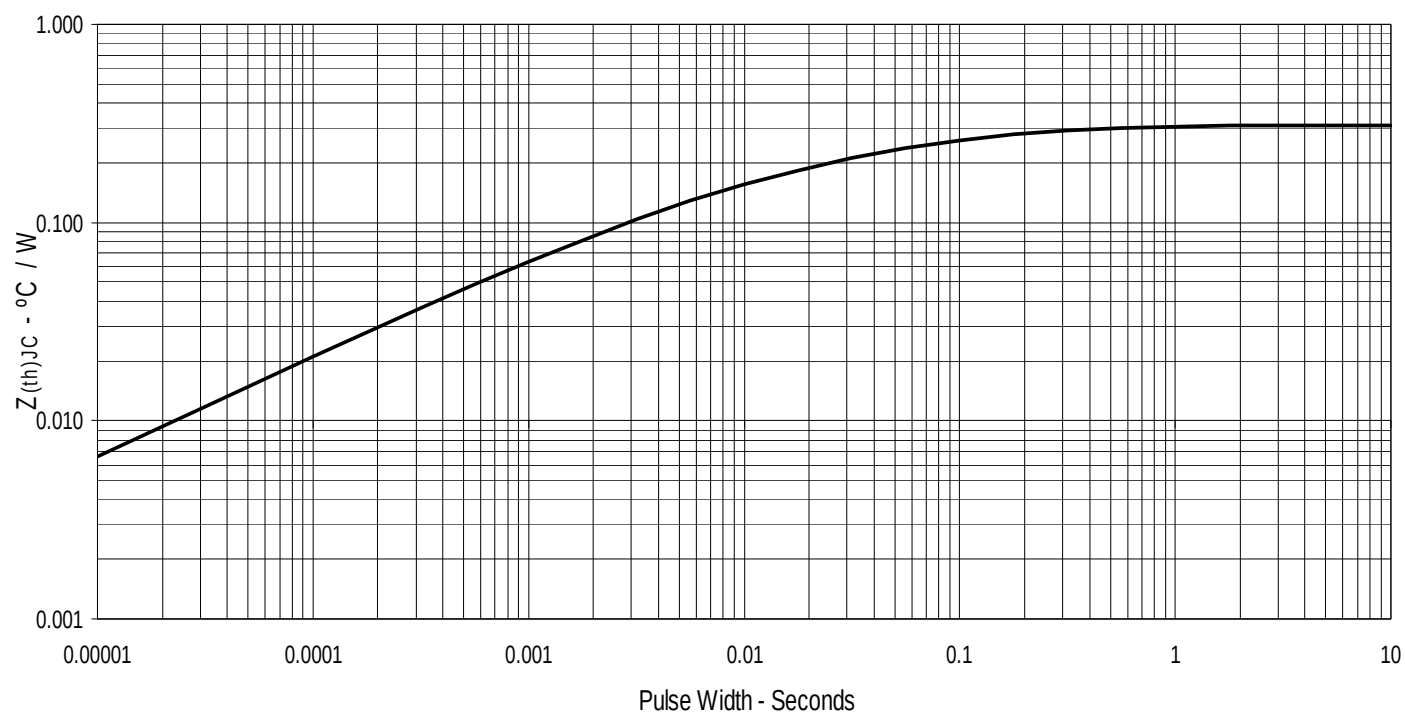


Fig. 19. Maximum Transient Thermal Impedance





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