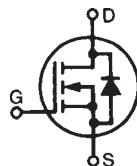


## HiPerFET™ Power MOSFETs

IXFK25N90 IXFX25N90  
IXFK26N90 IXFX26N90

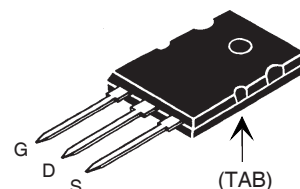
N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Diode



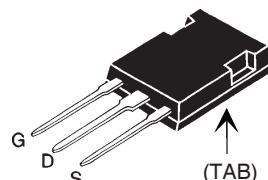
| $V_{DSS}$ | $I_{D25}$ | $R_{DS(on)}$ |
|-----------|-----------|--------------|
| 900V      | 25A       | 330mΩ        |
| 900V      | 26A       | 300mΩ        |

| 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                |
| $V_{GSS}$  | Continuous                                                                   | $\pm 20$          |     | V                |
| $V_{GSM}$  | Transient                                                                    | $\pm 30$          |     | V                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$                                                     | 25N90             | 25  | A                |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                   | 25N90             | 100 | A                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$                                                     | 26N90             | 26  | A                |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                   | 26N90             | 104 | A                |
| $I_A$      | $T_C = 25^\circ\text{C}$                                                     | 25N90             | 25  | A                |
|            |                                                                              | 26N90             | 26  | A                |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$                                                     |                   | 3   | J                |
| $dV/dt$    | $I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$     | 5                 |     | V/ns             |
| $P_D$      | $T_C = 25^\circ\text{C}$                                                     | 560               |     | W                |
| $T_J$      |                                                                              | -55 ... +150      |     | $^\circ\text{C}$ |
| $T_{JM}$   |                                                                              | 150               |     | $^\circ\text{C}$ |
| $T_{stg}$  |                                                                              | -55 ... +150      |     | $^\circ\text{C}$ |
| $T_L$      | 1.6mm (0.062 in.) from case for 10s                                          | 300               |     | $^\circ\text{C}$ |
| $T_{SOLD}$ | Plastic body for 10s                                                         | 260               |     | $^\circ\text{C}$ |
| $M_d$      | Mounting torque (IXFK)                                                       | 1.13/10           |     | Nm/lb.in.        |
| $F_c$      | Mounting force (IXFX)                                                        | 20..120 / 4.5..27 |     | N/lb.            |
| Weight     | TO-264                                                                       | 10                |     | g                |
|            | TO-247                                                                       | 6                 |     | g                |

TO-264



PLUS247



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

### Features

- International standard packages
- Avalanche Rated
- Low package inductance
- Low  $R_{DS(ON)}$  HDMOS Process
- Fast intrinsic diode

### Advantages

- Easy to mount
- Space savings
- High power density

### Applications:

- Switched-mode and resonant-mode power supplies
- DC-DC Converters
- Battery chargers
- DC choppers
- AC motor drives
- Temperature & lighting controls

| Symbol       | Test Conditions                                                                   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ unless otherwise specified) |      |                           |
|--------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------|------|---------------------------|
|              |                                                                                   | Min.                                                                            | Typ. | Max.                      |
| $BV_{DSS}$   | $V_{GS} = 0\text{V}$ , $I_D = 3\text{mA}$                                         | 900                                                                             |      | V                         |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 8\text{mA}$                                            | 3.0                                                                             |      | 5.0 V                     |
| $I_{GSS}$    | $V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$                                  |                                                                                 |      | $\pm 200$ nA              |
| $I_{DSS}$    | $V_{DS} = 0.8 \cdot V_{DSS}$<br>$V_{GS} = 0\text{V}$<br>$T_J = 125^\circ\text{C}$ |                                                                                 |      | 100 $\mu\text{A}$<br>2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10\text{V}$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1                        | 25N90<br>26N90                                                                  |      | 330 mΩ<br>300 mΩ          |

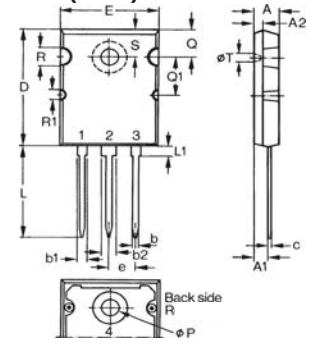
| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ unless otherwise specified)                                                                          | Characteristic Values |      |                         |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|-------------------------|
|              |                                                                                                                                                    | Min.                  | Typ. | Max.                    |
| $g_{fs}$     | $V_{DS} = 10\text{V}$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1                                                                                         | 18                    | 28   | S                       |
| $C_{iss}$    | $V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$                                                                                   |                       | 8.7  | 10.8 nF                 |
| $C_{oss}$    |                                                                                                                                                    |                       | 800  | 1000 pF                 |
| $C_{rss}$    |                                                                                                                                                    |                       | 300  | 375 pF                  |
| $t_{d(on)}$  | <b>Resistive Switching Times</b><br>$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$<br>$R_G = 1\Omega$ (External) |                       | 60   | ns                      |
| $t_r$        |                                                                                                                                                    |                       | 35   | ns                      |
| $t_{d(off)}$ |                                                                                                                                                    |                       | 130  | ns                      |
| $t_f$        |                                                                                                                                                    |                       | 24   | ns                      |
| $Q_{g(on)}$  | $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$                                                                   |                       | 260  | nC                      |
| $Q_{gs}$     |                                                                                                                                                    |                       | 70   | nC                      |
| $Q_{gd}$     |                                                                                                                                                    |                       | 100  | nC                      |
| $R_{thJC}$   |                                                                                                                                                    |                       |      | 0.22 $^\circ\text{C/W}$ |
| $R_{thCS}$   |                                                                                                                                                    | 0.15                  |      | $^\circ\text{C/W}$      |

### Source-Drain Diode

| Symbol   | Test Conditions                                                                                | Characteristic Values<br>$T_J = 25^\circ\text{C}$ unless otherwise specified) |      |               |
|----------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------|---------------|
|          |                                                                                                | Min.                                                                          | Typ. | Max.          |
| $I_S$    | $V_{GS} = 0\text{V}$                                                                           | 25N90                                                                         |      | 25 A          |
| $I_{SM}$ | Repetitive, pulse width limited by $T_{JM}$                                                    | 25N90                                                                         |      | 100 A         |
| $I_S$    | $V_{GS} = 0\text{V}$                                                                           | 26N90                                                                         |      | 26 A          |
| $I_{SM}$ | Repetitive, pulse width limited by $T_{JM}$                                                    | 26N90                                                                         |      | 104 A         |
| $V_{SD}$ | $I_F = I_S$ , $V_{GS} = 0\text{V}$ , Note 1                                                    |                                                                               |      | 1.5 V         |
| $t_{rr}$ | $I_F = I_S$ , $-di/dt = 100\text{A}/\mu\text{s}$<br>$V_R = 100\text{V}$ , $V_{GS} = 0\text{V}$ |                                                                               | 1.4  | ns            |
| $Q_{RM}$ |                                                                                                |                                                                               | 10   | $\mu\text{C}$ |
| $I_{RM}$ |                                                                                                |                                                                               |      | A             |

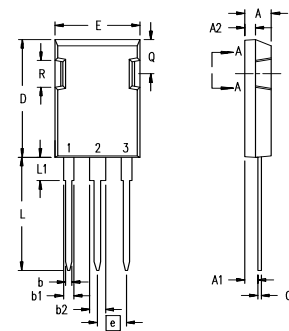
Note 1: Pulse test,  $t \leq 300\mu\text{s}$ ; duty cycle,  $d \leq 2\%$ .

### TO-264 (IXFK) Outline



| Dim. | Millimeter |       | Inches   |       |
|------|------------|-------|----------|-------|
|      | Min.       | Max.  | Min.     | Max.  |
| A    | 4.82       | 5.13  | .190     | .202  |
| A1   | 2.54       | 2.89  | .100     | .114  |
| A2   | 2.00       | 2.10  | .079     | .083  |
| b    | 1.12       | 1.42  | .044     | .056  |
| b1   | 2.39       | 2.69  | .094     | .106  |
| b2   | 2.90       | 3.09  | .114     | .122  |
| c    | 0.53       | 0.83  | .021     | .033  |
| D    | 25.91      | 26.16 | 1.020    | 1.030 |
| E    | 19.81      | 19.96 | .780     | .786  |
| e    | 5.46 BSC   |       | .215 BSC |       |
| J    | 0.00       | 0.25  | .000     | .010  |
| K    | 0.00       | 0.25  | .000     | .010  |
| L    | 20.32      | 20.83 | .800     | .820  |
| L1   | 2.29       | 2.59  | .090     | .102  |
| P    | 3.17       | 3.66  | .125     | .144  |
| Q    | 6.07       | 6.27  | .239     | .247  |
| Q1   | 8.38       | 8.69  | .330     | .342  |
| R    | 3.81       | 4.32  | .150     | .170  |
| R1   | 1.78       | 2.29  | .070     | .090  |
| S    | 6.04       | 6.30  | .238     | .248  |
| T    | 1.57       | 1.83  | .062     | .072  |

### PLUS 247™ (IXFX) Outline



Terminals: 1 - Gate  
2 - Drain (Collector)  
3 - Source (Emitter)

| Dim. | Millimeter |       | Inches   |      |
|------|------------|-------|----------|------|
|      | Min.       | Max.  | Min.     | Max. |
| A    | 4.83       | 5.21  | .190     | .205 |
| A1   | 2.29       | 2.54  | .090     | .100 |
| A2   | 1.91       | 2.16  | .075     | .085 |
| b    | 1.14       | 1.40  | .045     | .055 |
| b1   | 1.91       | 2.13  | .075     | .084 |
| b2   | 2.92       | 3.12  | .115     | .123 |
| C    | 0.61       | 0.80  | .024     | .031 |
| D    | 20.80      | 21.34 | .819     | .840 |
| E    | 15.75      | 16.13 | .620     | .635 |
| e    | 5.45 BSC   |       | .215 BSC |      |
| L    | 19.81      | 20.32 | .780     | .800 |
| L1   | 3.81       | 4.32  | .150     | .170 |
| Q    | 5.59       | 6.20  | .220     | .244 |
| R    | 4.32       | 4.83  | .170     | .190 |

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    |             |

Figure 1. Output Characteristics at 25°C

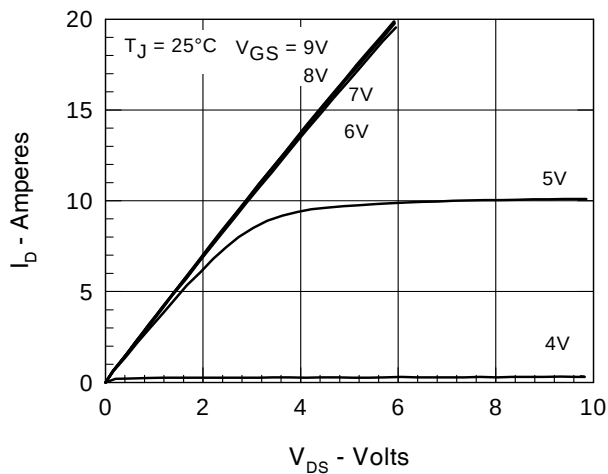


Figure 2. Extended Output Characteristics at 125°C

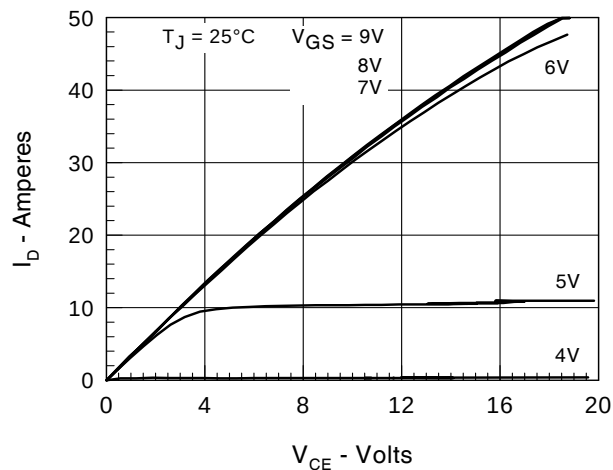


Figure 3.  $R_{DS(on)}$  normalized to 0.5  $I_{D25}$  value vs.  $I_D$

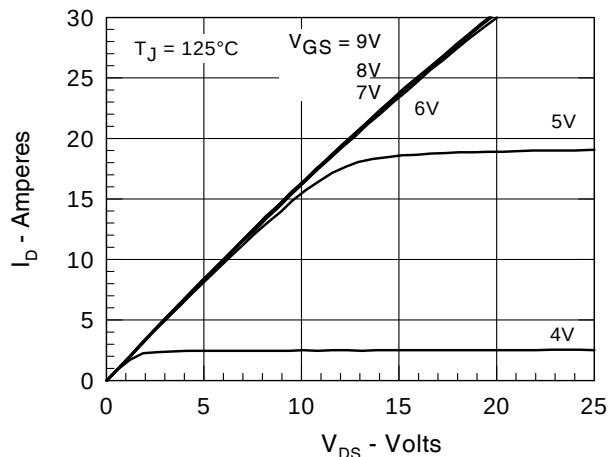


Figure 4. Admittance Curves

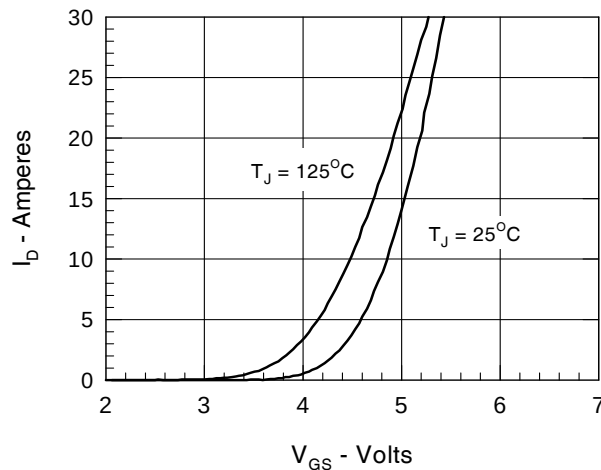


Figure 5.  $R_{DS(on)}$  normalized to 0.5  $I_{D25}$  value vs.  $I_D$

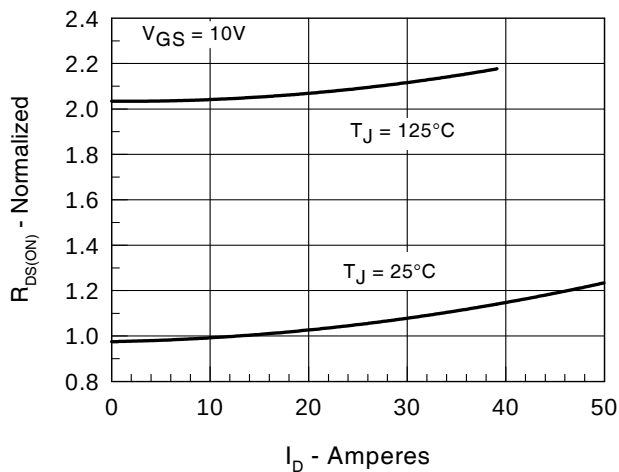


Fig. 6.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Junction Temperature

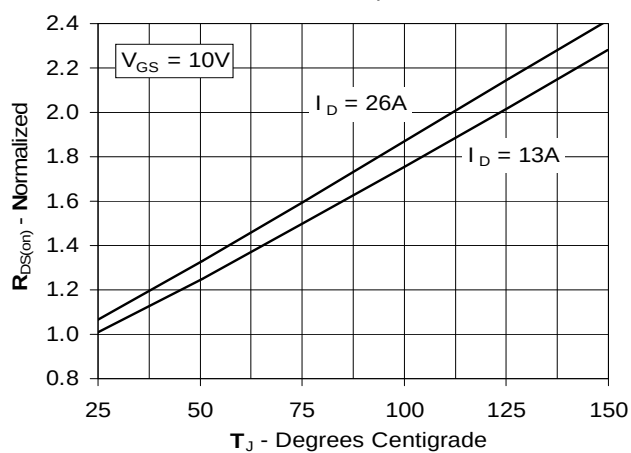


Figure 7. Gate Charge

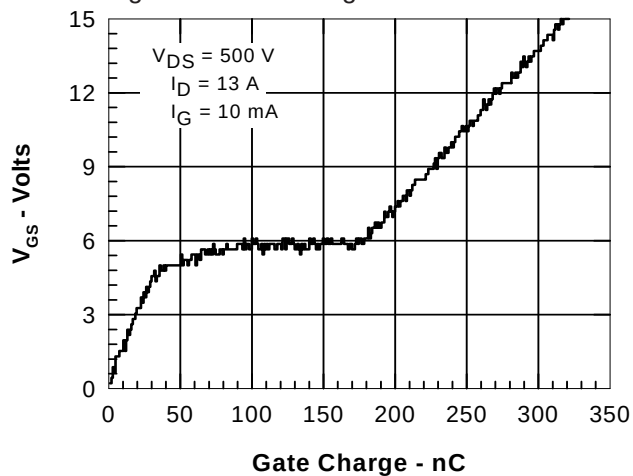


Figure 8. Capacitance Curves

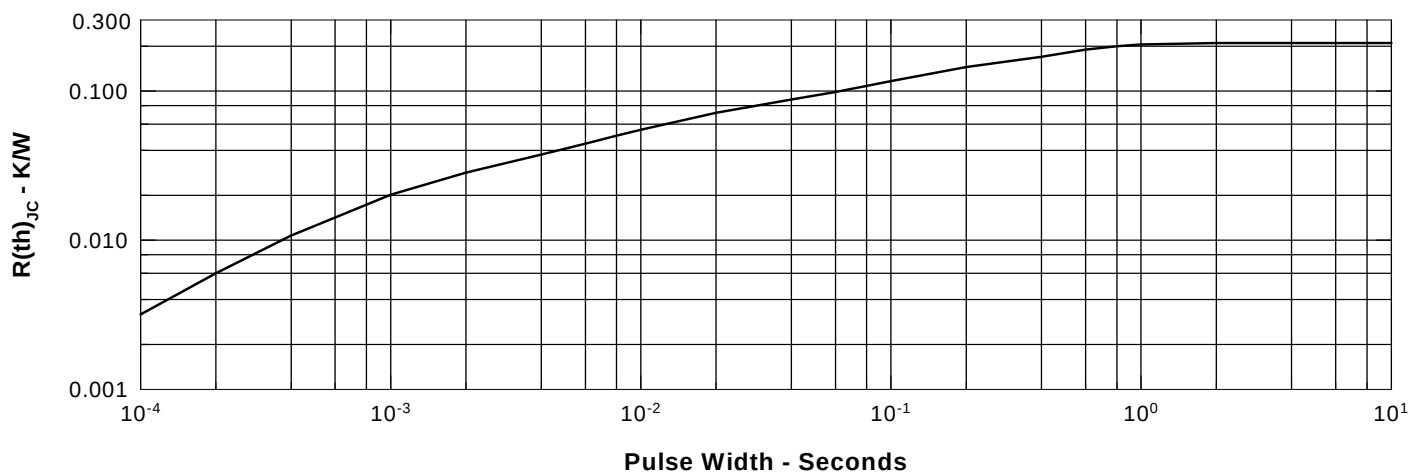
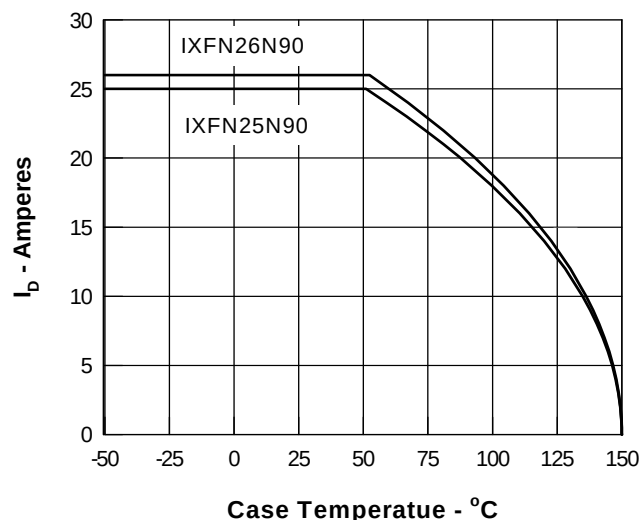
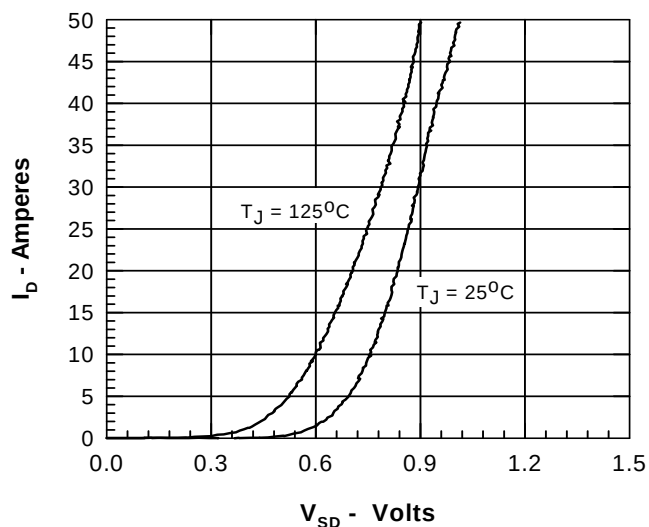
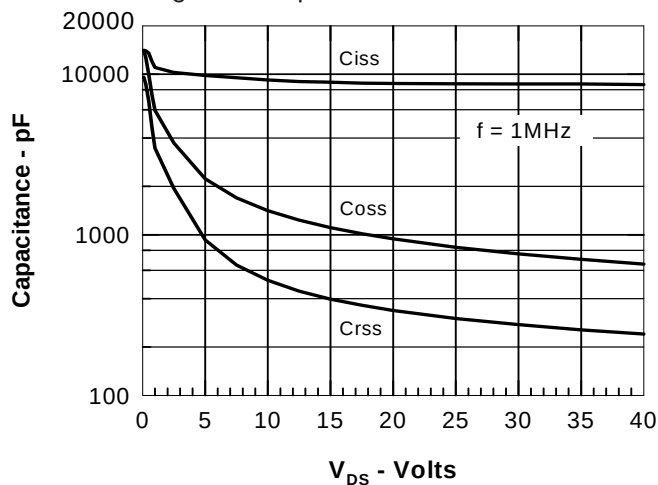


Figure 11. Transient Thermal Resistance

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