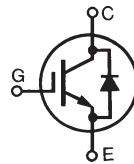


# High Voltage, High Gain BIMOSFET™ Monolithic Bipolar MOS Transistor

## IXBX25N250



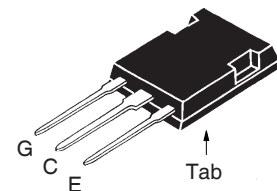
$$V_{CES} = 2500V$$

$$I_{C90} = 25A$$

$$V_{CE(sat)} \leq 3.3V$$

Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_C = 25^\circ C$ to $150^\circ C$	2500	V
$V_{CGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GE} = 1M\Omega$	2500	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ C$	55	A
$I_{C90}$	$T_C = 90^\circ C$	25	A
$I_{CM}$	$T_C = 25^\circ C$ , 1ms	180	A
<b>SSOA</b>	$V_{GE} = 15V$ , $T_{VJ} = 125^\circ C$ , $R_G = 4.7\Omega$	$I_{CM} = 80$	A
<b>(RBSOA)</b>	Clamped Inductive Load	$V_{CES} \leq 2000$	V
$P_C$	$T_C = 25^\circ C$	300	W
$T_J$		-55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55 ... +150	$^\circ C$
$T_L$	1.6mm (0.062 in.) From Case for 10s	300	$^\circ C$
$T_{SOLD}$	Plastic Body for 10 seconds	260	$^\circ C$
$F_C$	Mounting Force	20..120 / 4.5..27	N/lb.
<b>Weight</b>		6	g

### PLUS247™



G = Gate                      E = Emitter  
C = Collector                Tab = Collector

### Features

- High Blocking Voltage
- International Standard Package
- Low Conduction Losses

### Advantages

- Low Gate Drive Requirement
- High Power Density

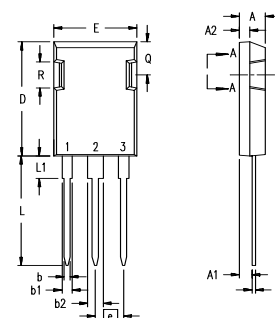
### Applications

- Switch-Mode and Resonant-Mode Power Supplies
- Uninterruptible Power Supplies (UPS)
- Laser Generator
- Capacitor Discharge Circuit
- AC Switches

Symbol	Test Conditions ( $T_J = 25^\circ C$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 250\mu A$ , $V_{GE} = 0V$	2500		V
$V_{GE(th)}$	$I_C = 250\mu A$ , $V_{CE} = V_{GE}$	2.5		5.0 V
$I_{CES}$	$V_{CE} = 0.8 \cdot V_{CES}$ , $V_{GE} = 0V$ $T_J = 125^\circ C$			50 $\mu A$ 3 mA
$I_{GES}$	$V_{CE} = 0V$ , $V_{GE} = \pm 20V$			$\pm 100$ nA
$V_{CE(sat)}$	$I_C = I_{C90}$ , $V_{GE} = 15V$ , Note 1 $T_J = 125^\circ C$		3.4	3.3 V

Symbol Test Conditions ( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)		Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$I_C = 25\text{A}, V_{CE} = 10\text{V}, \text{Note 1}$	11	18	S
$C_{ies}$	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		2450	pF
$C_{oes}$			96	pF
$C_{res}$			35	pF
$Q_g$	$I_C = 25\text{A}, V_{GE} = 15\text{V}, V_{CE} = 1000\text{V}$		103	nC
$Q_{ge}$			17	nC
$Q_{gc}$			43	nC
$t_{d(on)}$	<b>Resistive Switching times, <math>T_J = 25^\circ\text{C}</math></b> $I_C = 25\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 1250\text{V}, R_G = 4.7\Omega$		55	ns
$t_r$			240	ns
$t_{d(off)}$			145	ns
$t_f$			640	ns
$t_{d(on)}$	<b>Resistive Switching times, <math>T_J = 125^\circ\text{C}</math></b> $I_C = 25\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 1250\text{V}, R_G = 4.7\Omega$		54	ns
$t_r$			640	ns
$t_{d(off)}$			140	ns
$t_f$			510	ns
$R_{thJC}$			0.42	$^\circ\text{C/W}$
$R_{thCS}$		0.15		$^\circ\text{C/W}$

### PLUS 247™ (IXBX) Outline



Terminals: 1 - Gate  
2 - Collector  
3 - Emitter

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A <sub>1</sub>	2.29	2.54	.090	.100
A <sub>2</sub>	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b <sub>1</sub>	1.91	2.13	.075	.084
b <sub>2</sub>	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	0.244
R	4.32	4.83	.170	.190

### Reverse Diode

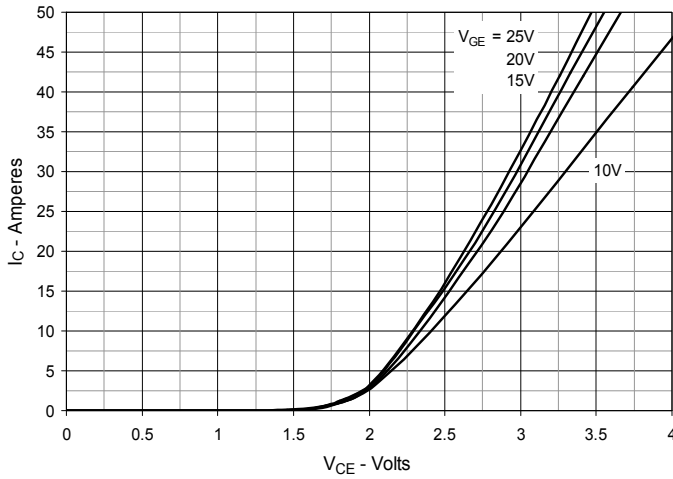
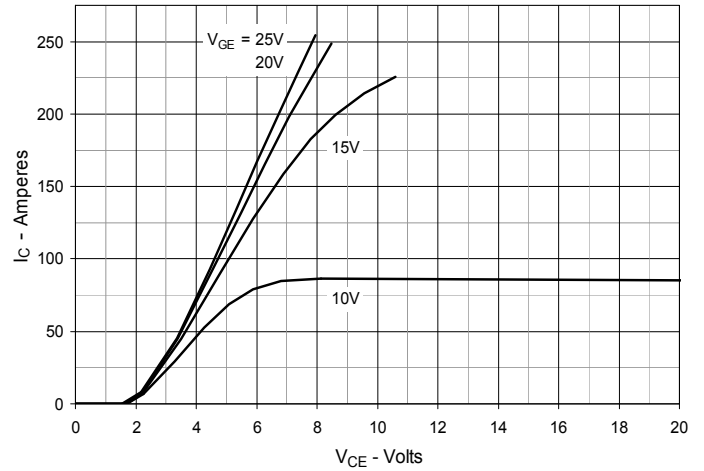
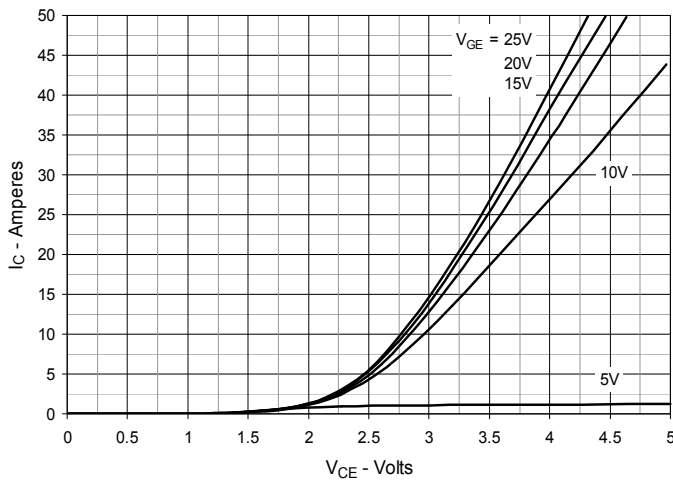
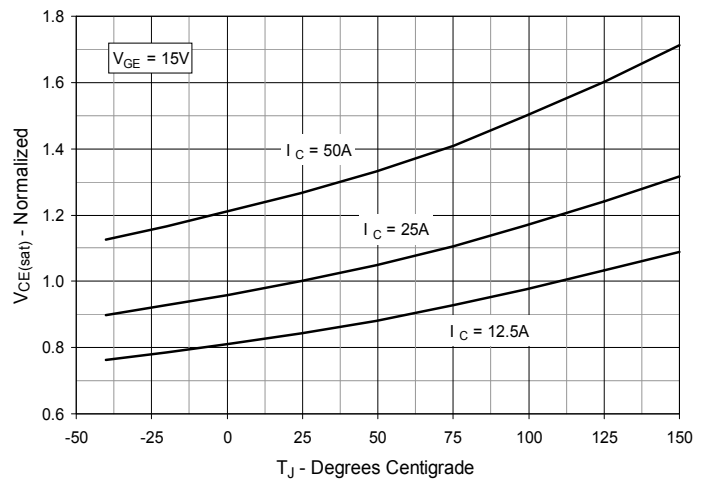
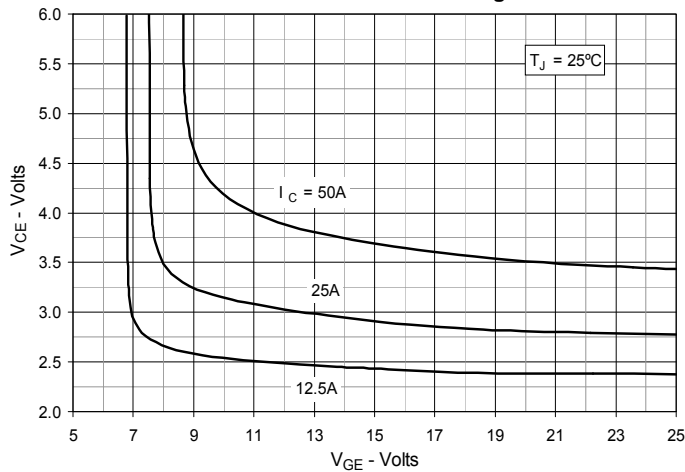
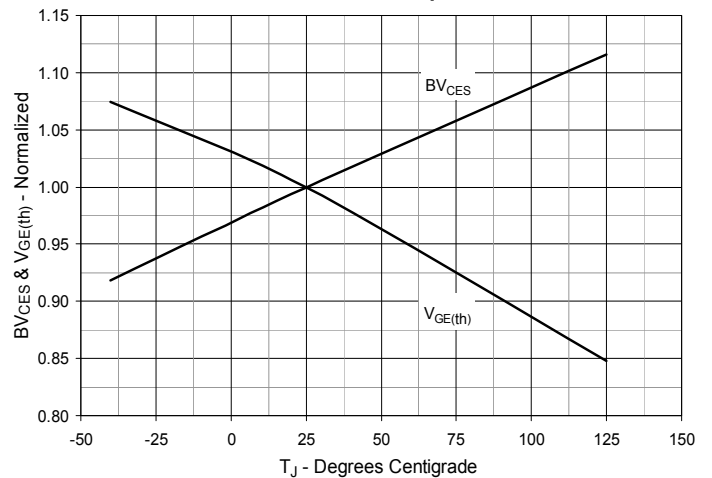
Symbol Test Conditions ( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)		Characteristic Values		
		Min.	Typ.	Max.
$V_F$	$I_F = 25\text{A}, V_{GE} = 0\text{V}$			2.3 V
$t_{rr}$	$I_F = 25\text{A}, -di_F/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GE} = 0\text{V}$		1.6	$\mu\text{s}$
$I_{RM}$			37.2	A

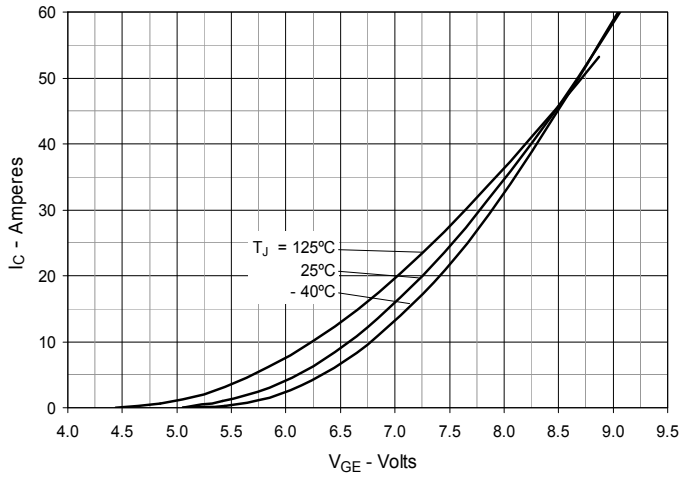
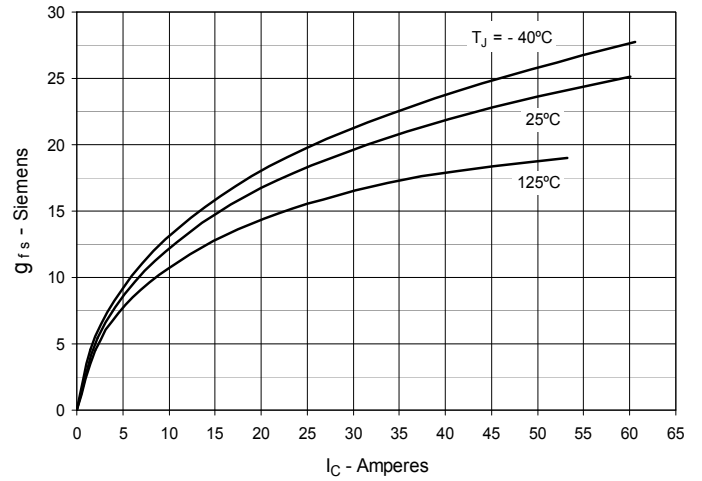
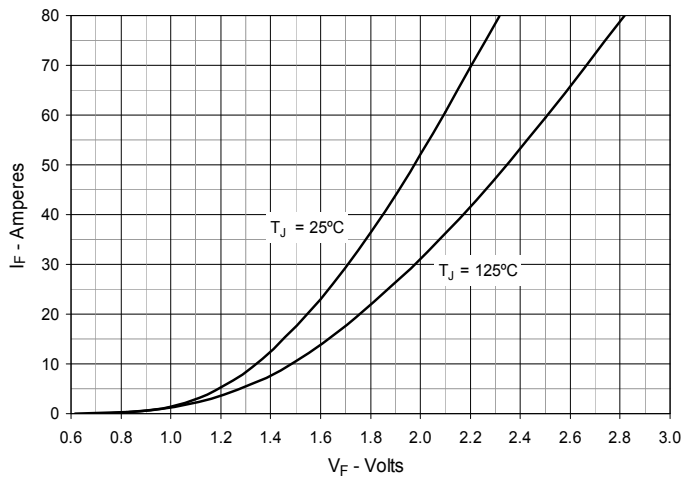
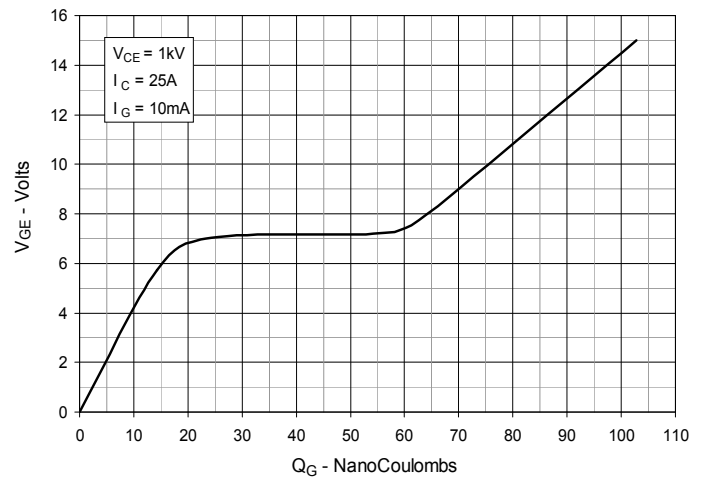
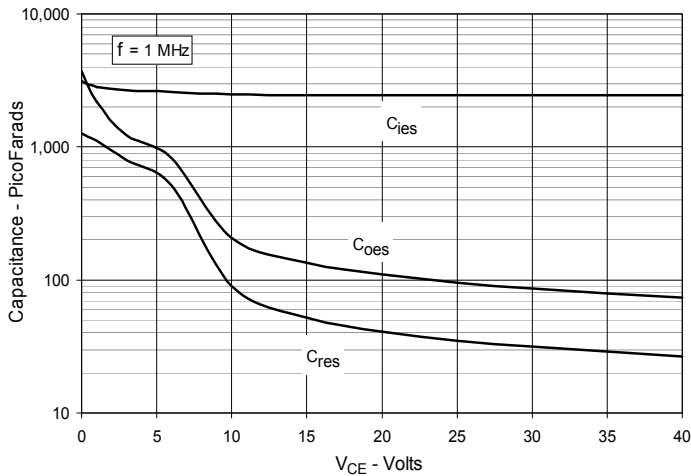
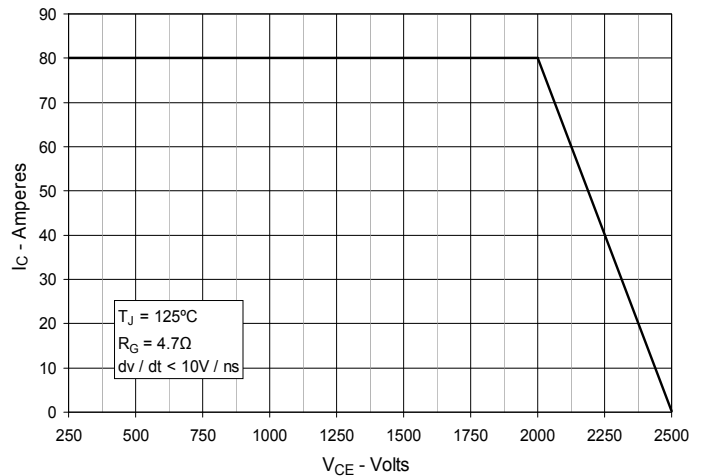
Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

\*Additional provisions for lead to lead voltage isolation are required at  $V_{DS} > 1200\text{V}$ .

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 @  $T_J = 25^\circ\text{C}$** 

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

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

**Fig. 4. Dependence of  $V_{CE(sat)}$  on Junction Temperature**

**Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage**

**Fig. 6. Breakdown & Threshold Voltages vs. Junction 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. Reverse-Bias Safe Operating Area**


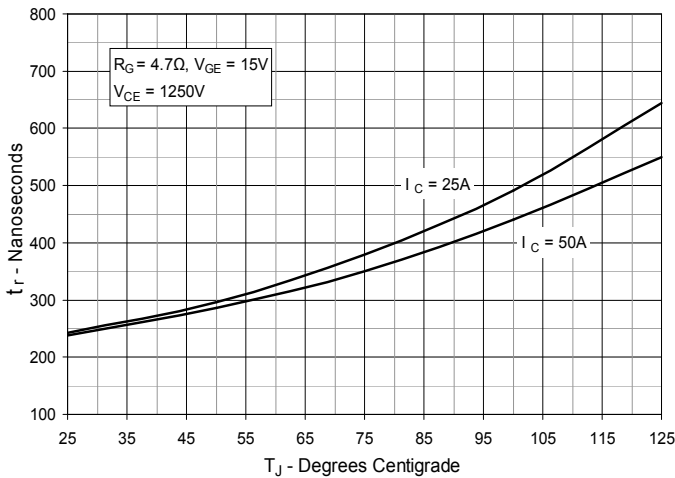
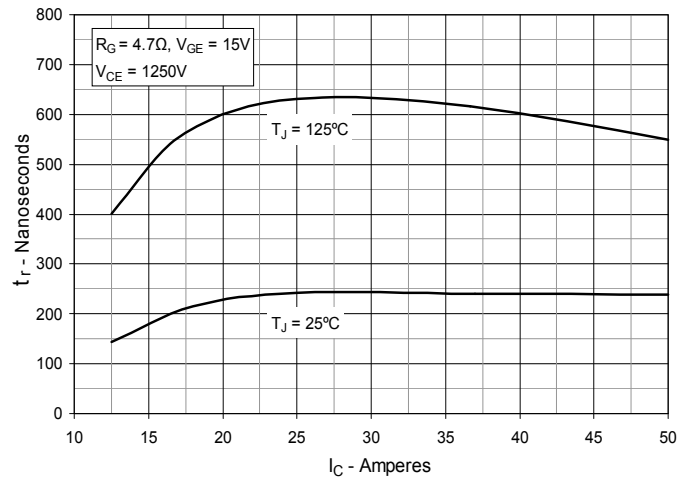
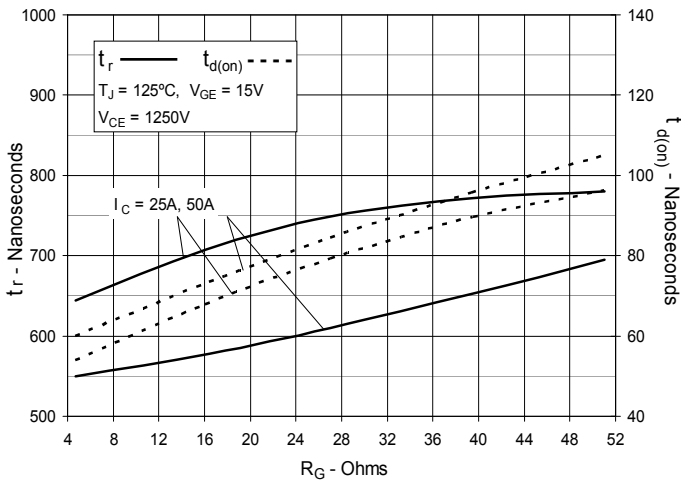
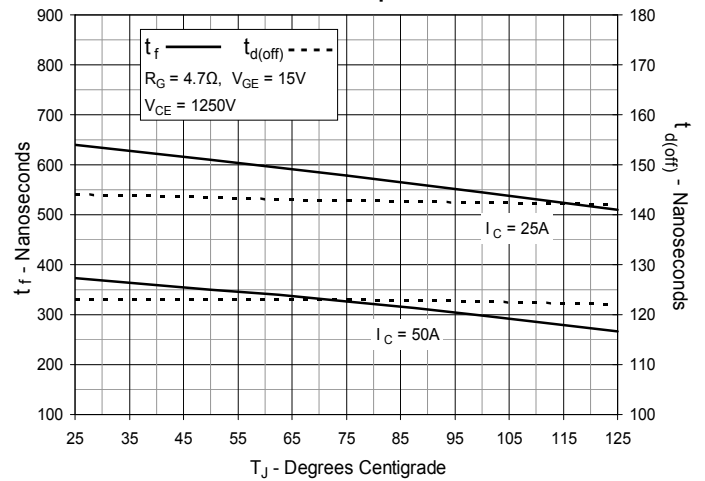
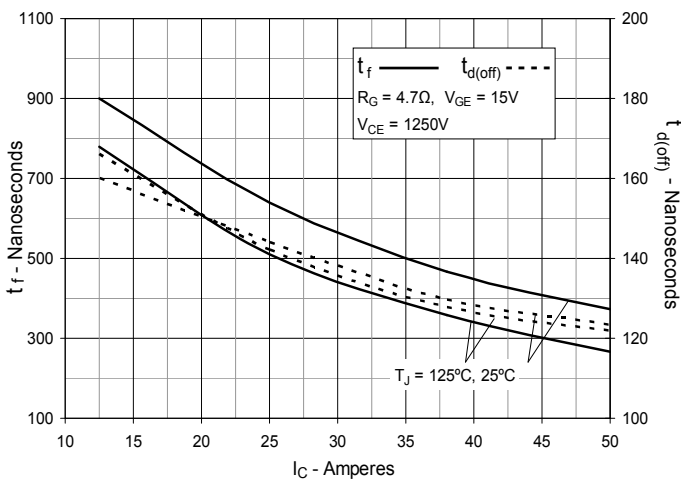
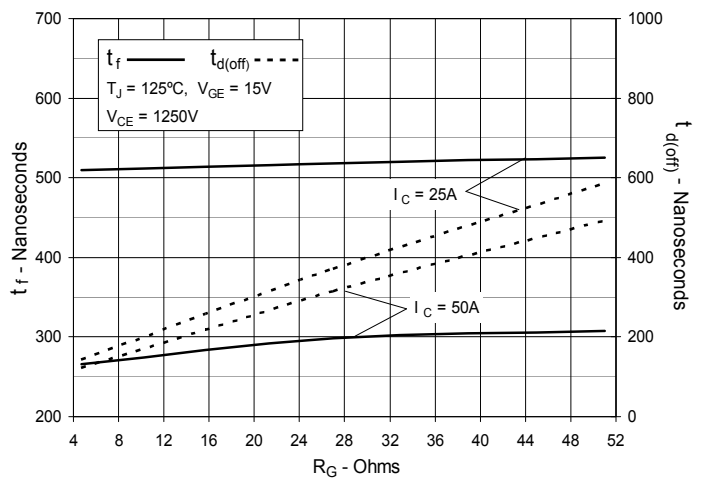
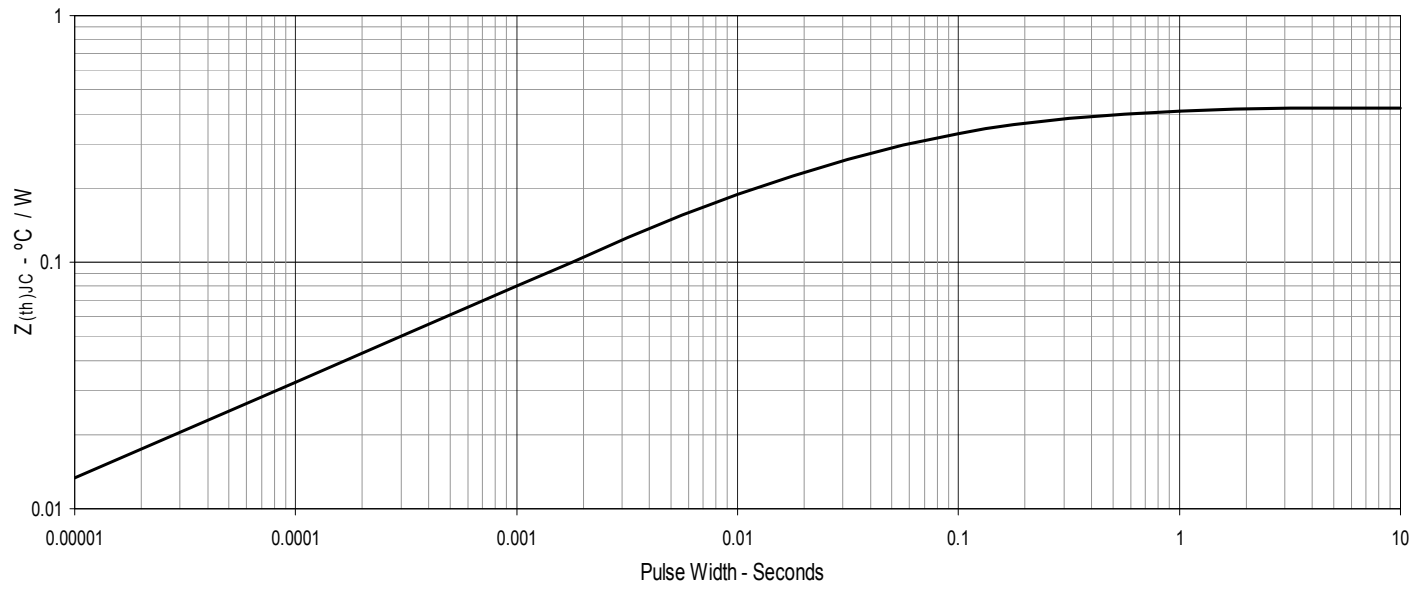
**Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature**

**Fig. 14. Resistive Turn-on Rise Time vs. Drain Current**

**Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance**

**Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature**

**Fig. 17. Resistive Turn-off Switching Times vs. Drain Current**

**Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance**


Fig. 19. Maximum Transient Thermal Impedance





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