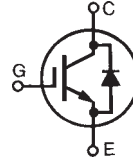


# High Voltage, High Gain BiMOSFET™

## IXBK64N250 IXBX64N250

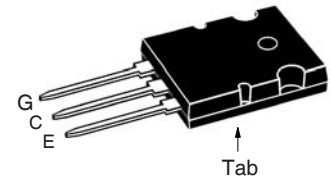
$V_{CES} = 2500V$   
 $I_{C110} = 64A$   
 $V_{CE(sat)} \leq 3.0V$

### Monolithic Bipolar MOS Transistor

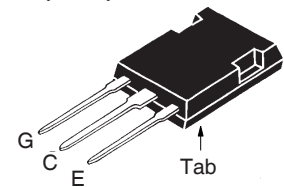


Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ C$ to $150^\circ C$	2500	V
$V_{CGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GE} = 1M\Omega$	2500	V
$V_{GES}$	Continuous	$\pm 25$	V
$V_{GEM}$	Transient	$\pm 35$	V
$I_{C25}$	$T_C = 25^\circ C$ (Chip Capability)	156	A
$I_{LRMS}$	Lead Current Limit, RMS	120	A
$I_{C100}$	$T_C = 110^\circ C$	64	A
$I_{CM}$	$T_C = 25^\circ C$ , 1ms	600	A
<b>SSOA</b>	$V_{GE} = 15V$ , $T_{VJ} = 125^\circ C$ , $R_G = 1\Omega$	$I_{CM} = 160$	A
<b>(RBSOA)</b>	Clamped Inductive Load	$V_{CE} \leq 0.8 \cdot V_{CES}$	
$T_{SC}$ <b>(SCSOA)</b>	$V_{GE} = 15V$ , $T_J = 125^\circ C$ , $R_G = 5\Omega$ , $V_{CE} = 1250V$ , Non-Repetitive	10	$\mu s$
$P_C$	$T_C = 25^\circ C$	735	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 (0.062 in.) from Case for 10	260	$^\circ C$
$M_d$	Mounting Torque (TO-264)	1.13/10	Nm/lb.in.
$F_c$	Mounting Force (PLUS247)	20..120/4.5..27	N/lb.
<b>Weight</b>	TO-264	10	g
	PLUS247	6	g

TO-264 (IXBK)



PLUS247™ (IXBX)



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

#### Features

- High Blocking Voltage
- Low Switching Losses
- High Current Handling Capability
- Anti-Parallel Diode

#### Advantages

- High Power Density
- Low Gate Drive Requirement

#### Applications

- Switch-Mode and Resonant-Mode Power Supplies
- Uninterrupted Power Supplies (UPS)
- Capacitor Discharge Circuits
- Laser Generators

Symbol	Test Conditions ( $T_J = 25^\circ C$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 1mA$ , $V_{GE} = 0V$	2500		V
$V_{GE(th)}$	$I_C = 4mA$ , $V_{CE} = V_{GE}$	3.0		5.0 V
$I_{CES}$	$V_{CE} = 0.8 \cdot V_{CES}$ , $V_{GE} = 0V$ $T_J = 125^\circ C$			50 $\mu A$ 6 mA
$I_{GES}$	$V_{CE} = 0V$ , $V_{GE} = \pm 25V$			$\pm 200$ nA
$V_{CE(sat)}$	$I_C = I_{C110}$ , $V_{GE} = 15V$ , Note 1 $T_J = 125^\circ C$		2.5 3.1	V V

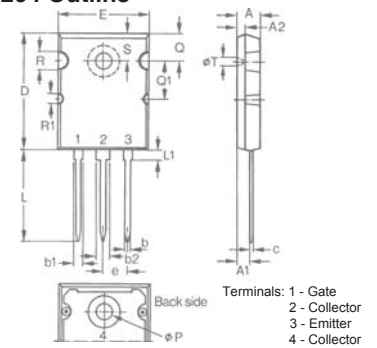
### Symbol Test Conditions

( $T_J = 25^\circ\text{C}$  Unless Otherwise Specified)

### Characteristic Values

		Min.	Typ.	Max.	
$g_{fs}$	$I_C = I_{C110}, V_{CE} = 10V, \text{Note 1}$	40	72		S
$C_{ies}$	$V_{CE} = 25V, V_{GE} = 0V, f = 1\text{MHz}$		8900		pF
$C_{oes}$			345		pF
$C_{res}$			118		pF
$Q_g$	$I_C = I_{C110}, V_{GE} = 15V, V_{CE} = 600V$		400		nC
$Q_{ge}$			46		nC
$Q_{gc}$			155		nC
$t_{d(on)}$	<b>Resistive Switching Times, <math>T_J = 25^\circ\text{C}</math></b> $I_C = 128A, V_{GE} = 15V$ $V_{CE} = 1250V, R_G = 1\Omega$		49		ns
$t_r$			318		ns
$t_{d(off)}$			232		ns
$t_f$			170		ns
$t_{d(on)}$	<b>Resistive Switching Times, <math>T_J = 125^\circ\text{C}</math></b> $I_C = 128A, V_{GE} = 15V$ $V_{CE} = 1250V, R_G = 1\Omega$		54		ns
$t_r$			578		ns
$t_{d(off)}$			222		ns
$t_f$			175		ns
$R_{thJC}$				0.17	$^\circ\text{C/W}$
$R_{thCS}$		0.15			$^\circ\text{C/W}$

### TO-264 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

### Reverse Diode

### Symbol Test Conditions

( $T_J = 25^\circ\text{C}$  Unless Otherwise Specified)

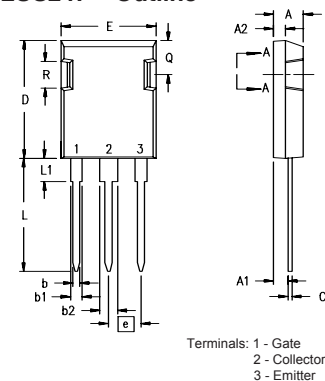
### Characteristic Values

		Min.	Typ.	Max.	
$V_F$	$I_F = I_{C110}, V_{GE} = 0V, \text{Note 1}$			3.0	V
$t_{rr}$	$I_F = I_{C110}, V_{GE} = 0V, -di_F/dt = 650A/\mu\text{s}$ $V_R = 600V, V_{GE} = 0V$		160		ns
$I_{RM}$			480		A

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

Additional provisions for lead-to-lead isolation are required at  $V_{CE} > 1200V$

### PLUS247™ Outline

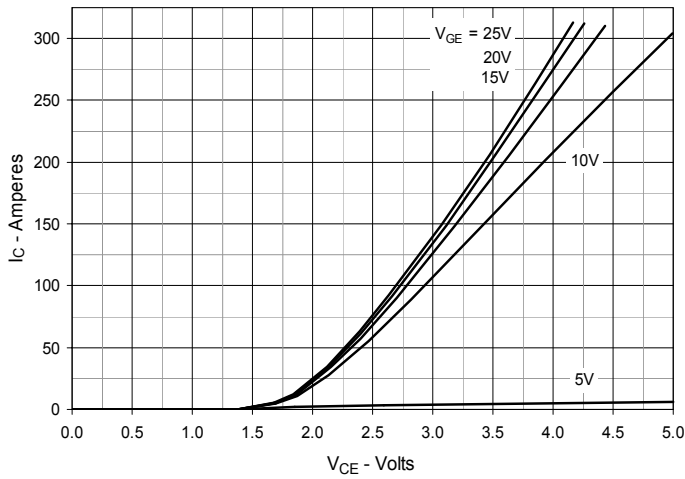
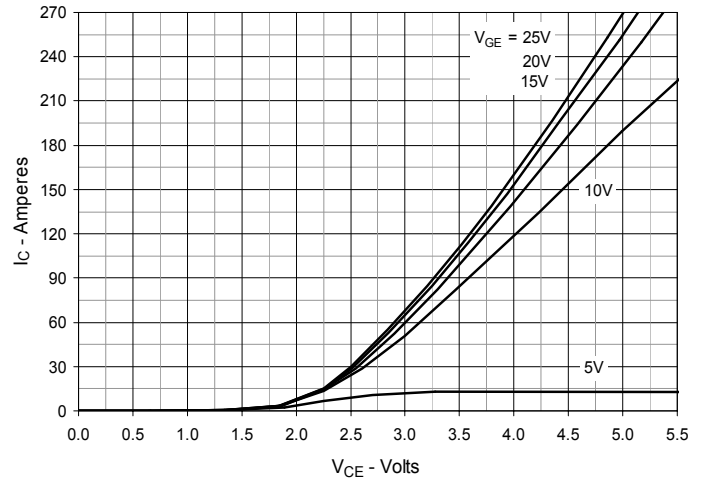
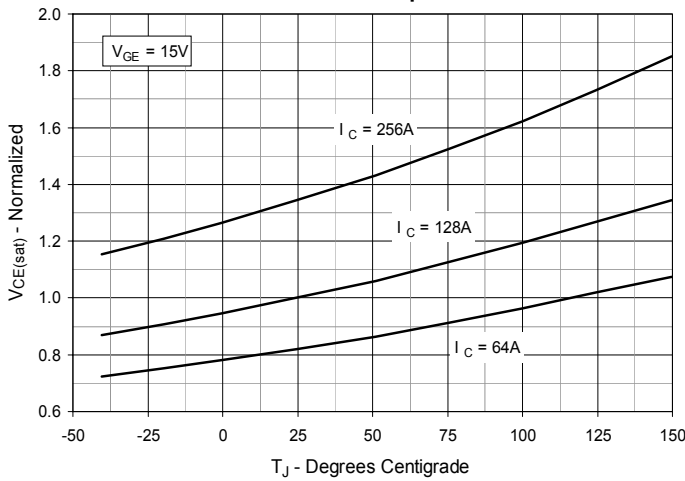
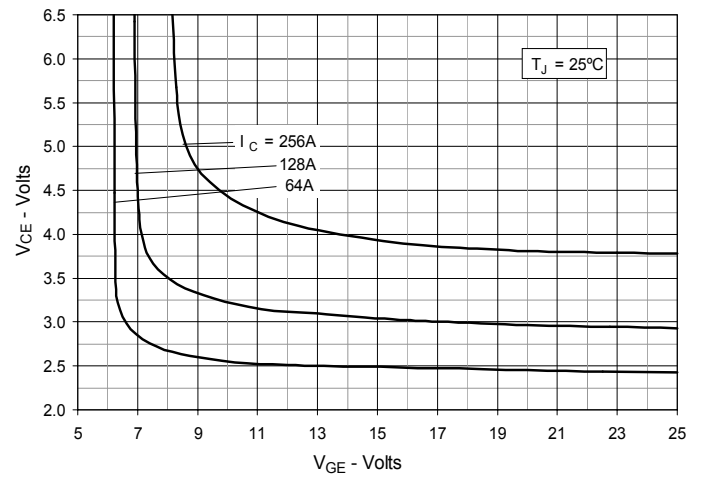
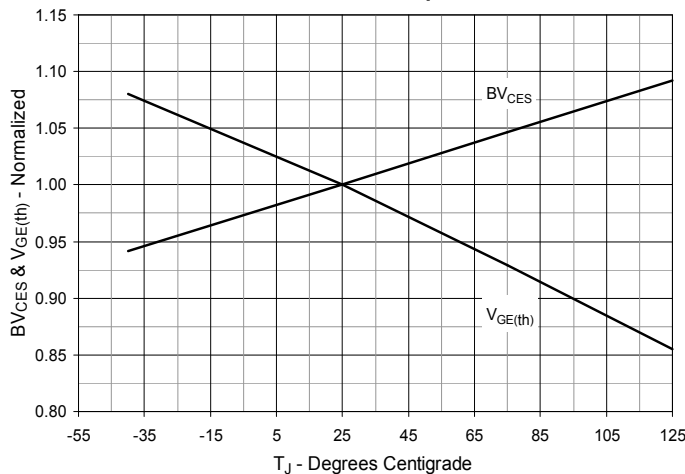
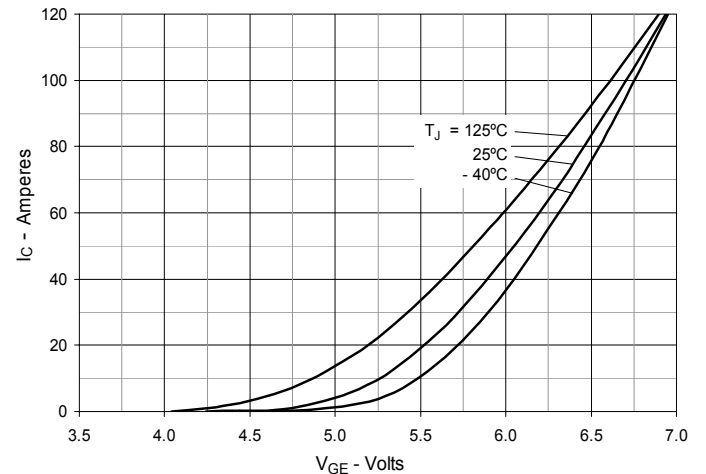


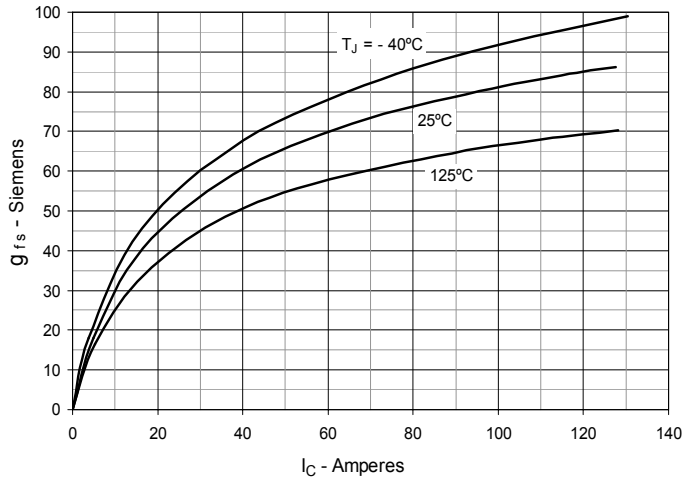
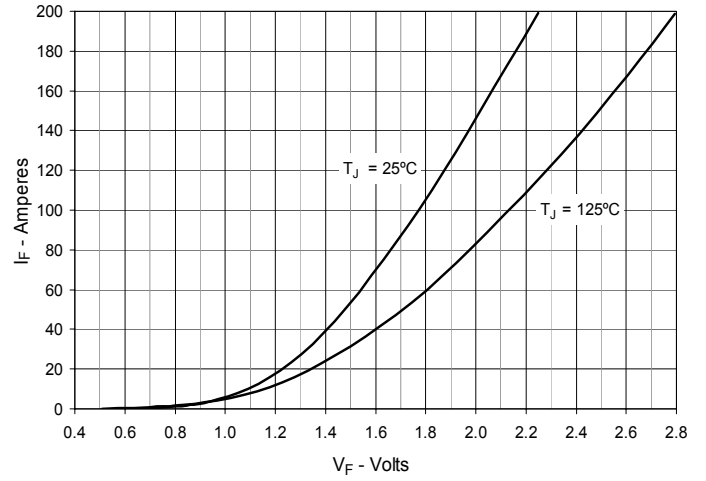
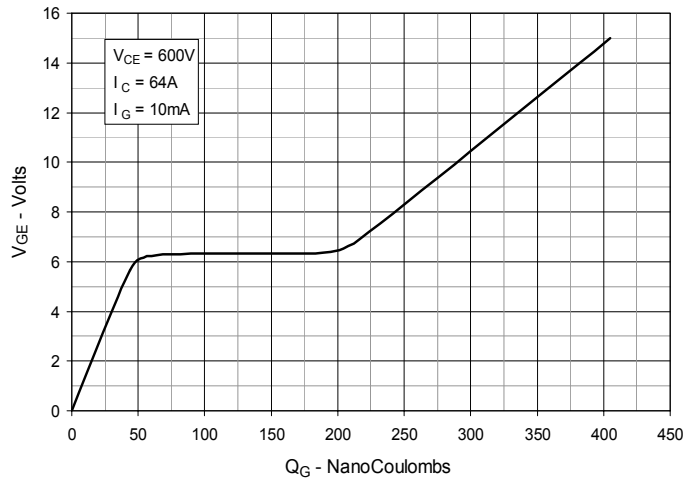
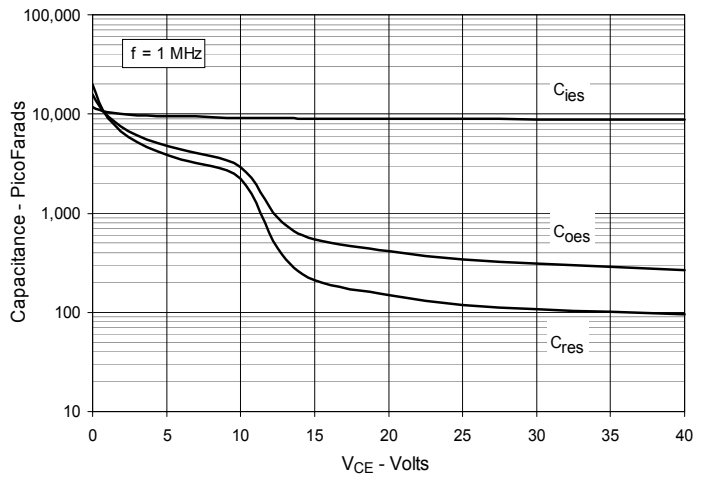
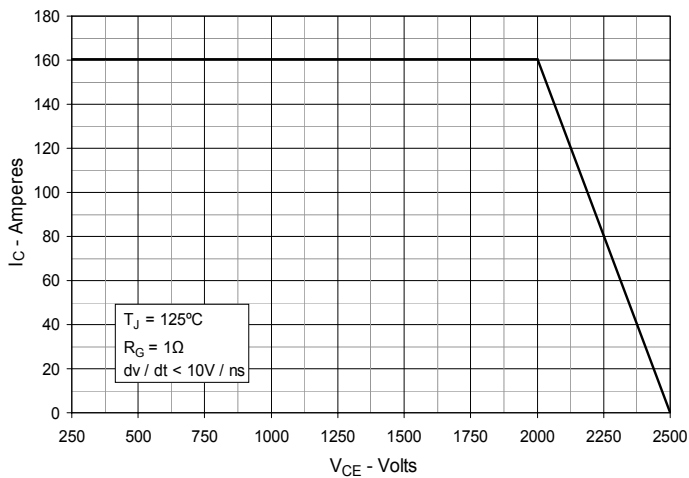
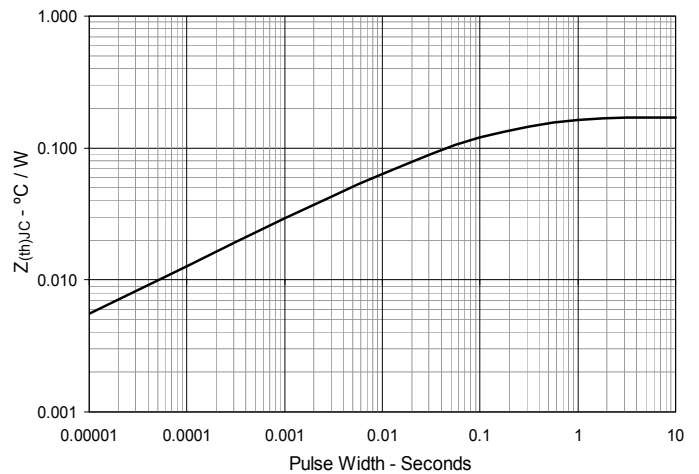
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A1	2.29	2.54	.090	.100
A2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b1	1.91	2.13	.075	.084
b2	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	0.244
R	4.32	4.83	.170	.190

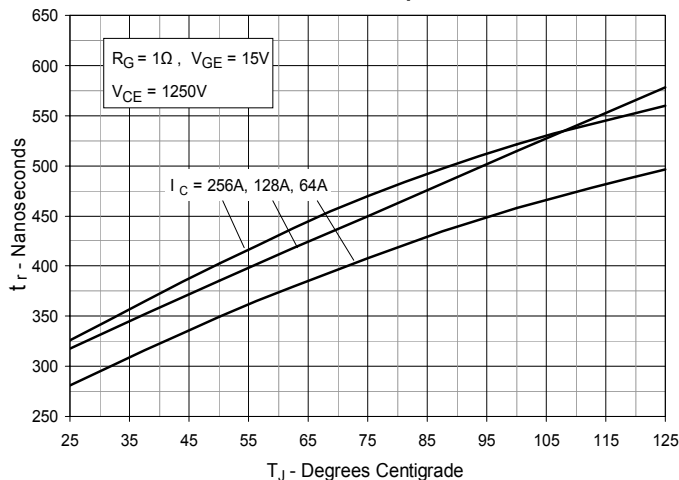
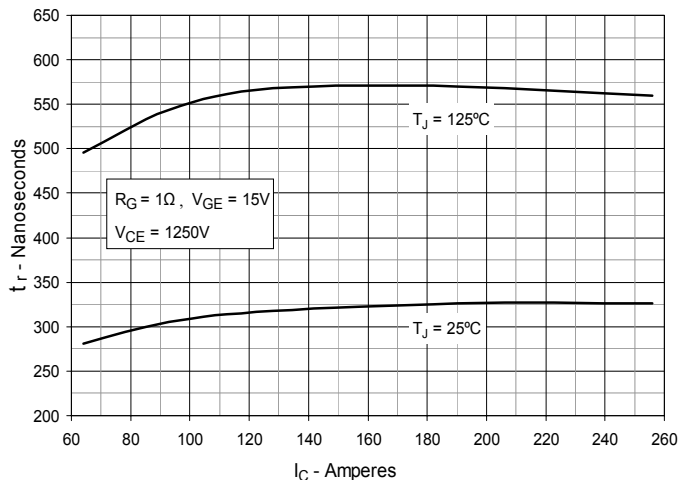
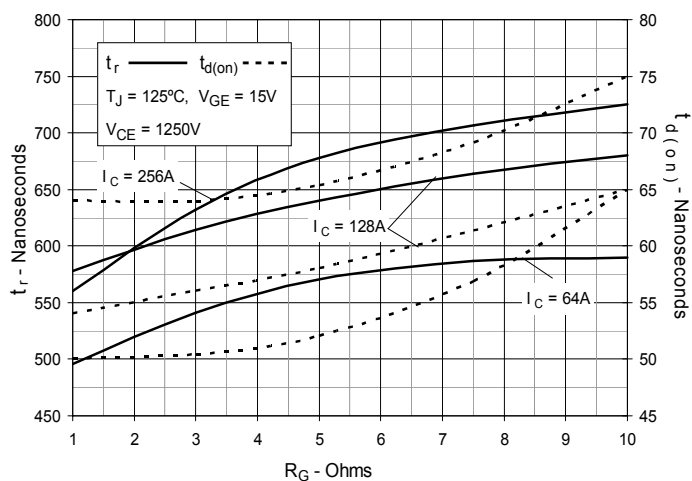
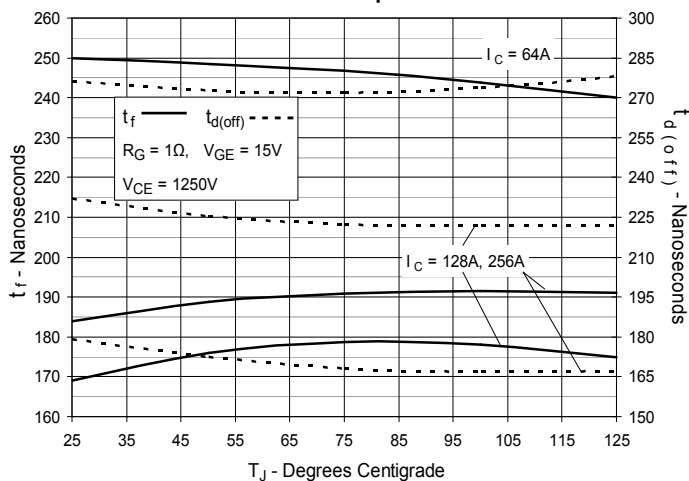
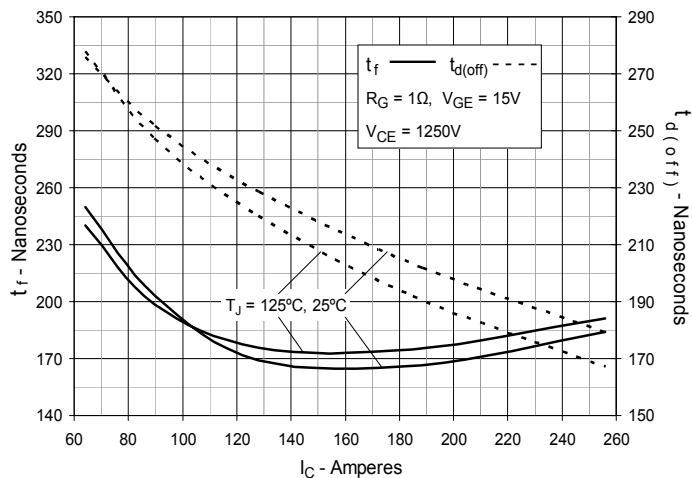
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

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	7,157,338 B2
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. Output Characteristics @  $T_J = 125^\circ\text{C}$** 

**Fig. 3. Dependence of  $V_{CE(sat)}$  on Junction Temperature**

**Fig. 4. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage**

**Fig. 5. Breakdown & Threshold Voltages vs. Junction Temperature**

**Fig. 6. Input Admittance**


**Fig. 7. Transconductance**

**Fig. 8. Forward Voltage Drop of Intrinsic Diode**

**Fig. 9. Gate Charge**

**Fig. 10. Capacitance**

**Fig. 11. Reverse-Bias Safe Operating Area**

**Fig. 12. Maximum Transient Thermal Impedance**


**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**
