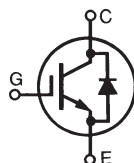


**BiMOSFET™ Monolithic  
Bipolar MOS Transistor**
**IXBN75N170A**


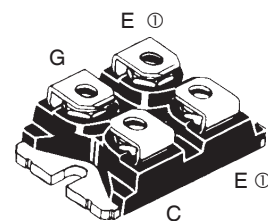
$$V_{CES} = 1700V$$

$$I_{C90} = 42A$$

$$V_{CE(sat)} \leq 6.00V$$

$$t_{fi(typ)} = 60ns$$

Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ C$ to $150^\circ C$	1700	V
$V_{CGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GE} = 1M\Omega$	1700	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ C$	75	A
$I_{C90}$	$T_C = 90^\circ C$	42	A
$I_{CM}$	$T_C = 25^\circ C$ , 1ms	350	A
<b>SSOA</b>	$V_{GE} = 15V$ , $T_{VJ} = 125^\circ C$ , $R_G = 1\Omega$	$I_{CM} = 100$	A
<b>(RBSOA)</b>	Clamped Inductive Load	$V_{CE} \leq 0.8 \cdot V_{CES}$	
$P_C$	$T_C = 25^\circ C$	625	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	$^\circ C$
$V_{ISOL}$	50/60Hz $t = 1min$	2500	V~
	$I_{ISOL} \leq 1mA$ $t = 1s$	3000	V~
$M_d$	Mounting Torque	1.5/13	Nm/lb.in.
	Terminal Connection Torque (M4)	1.3/11.5	Nm/lb.in.
<b>Weight</b>		30	g

**SOT-227B, miniBLOC**  


G = Gate, C = Collector, E = Emitter  
 Ⓧ either emitter terminal can be used as Main or Kelvin Emitter

**Features**

- International Standard Packages
- High Blocking Voltage
- Fast Switching
- Isolation Voltage 3000 V~
- High Current Handling Capability
- Anti-Parallel Diode

**Advantages**

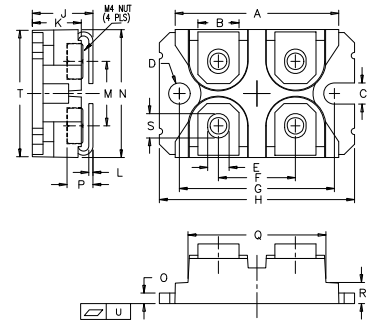
- High Power Density
- Low Gate Drive Requirement
- Easy to Mount with 2 Screws
- Integrated Diode Can Be Used for Protection

**Applications**

- Switched-Mode and Resonant-Mode Power Supplies
- UPS
- AC Motor Drives
- Substitutes for High Voltage MOSFETs

Symbol	Test Conditions ( $T_J = 25^\circ C$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 250\mu A$ , $V_{GE} = 0V$	1700		V
$V_{GE(th)}$	$I_C = 1.5mA$ , $V_{CE} = V_{GE}$	2.5		5.5 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 $T_J = 125^\circ C$	4.95	5.15	6.00 V V

Symbol Test Conditions ( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)		Characteristic Values			
		Min.	Typ.	Max.	
$g_{fS}$	$I_C = I_{C90}, V_{CE} = 10\text{V}$ , Note 1	28	48	S	
$C_{ies}$	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		7200	pF	
$C_{oes}$			450	pF	
$C_{res}$			150	pF	
$Q_g$	$I_C = I_{C90}, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$		358	nC	
$Q_{ge}$			46	nC	
$Q_{gc}$			148	nC	
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = I_{C90}, V_{GE} = 15\text{V}$ $V_{CE} = 0.8 \cdot V_{CES}, R_G = 1\Omega$ Note 2		26	ns	
$t_{ri}$			40	ns	
$t_{d(off)}$			418	ns	
$t_{fi}$			60	110	ns
$E_{off}$			3.80	7.00	mJ
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = I_{C90}, V_{GE} = 15\text{V}$ $V_{CE} = 0.8 \cdot V_{CES}, R_G = 1\Omega$ Note 2		27	ns	
$t_{ri}$			38	ns	
$t_{d(off)}$			420	ns	
$t_{fi}$			175	ns	
$E_{off}$			6.35	mJ	
$R_{thJC}$				0.20 $^\circ\text{C/W}$	
$R_{thCS}$		0.05		$^\circ\text{C/W}$	

**SOT-227B miniBLOC (IXBN)**


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.496	1.505	38.00	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.002	.004	-0.05	0.1

**Reverse Diode**

Symbol Test Conditions ( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)		Characteristic Values		
		Min.	Typ.	Max
$V_F$	$I_F = I_{C90}, V_{GE} = 0\text{V}$ , Note 1			4.2 V
$t_{rr}$	$I_F = I_{C90}, V_{GE} = 0\text{V}, -di_F/dt = 100\text{A}/\mu\text{s}$		360	ns
$I_{RM}$			19	A
$Q_{RM}$		$V_R = 100\text{V}, V_{GE} = 0\text{V}$		3.5

**Notes:**

1. Pulse test,  $t \leq 300\mu\text{s}$ ; duty cycle,  $d \leq 2\%$ .
2. Switching times & energy losses may increase for higher  $V_{CE}$  (Clamp),  $T_J$  or  $R_G$ .

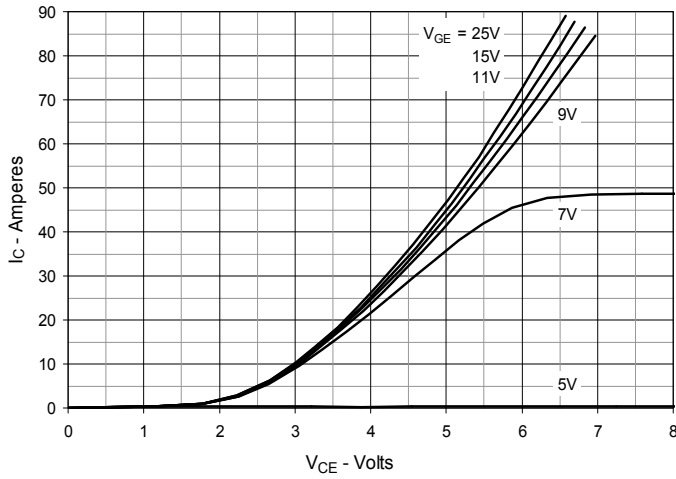
**PRELIMINARY TECHNICAL INFORMATION**

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.

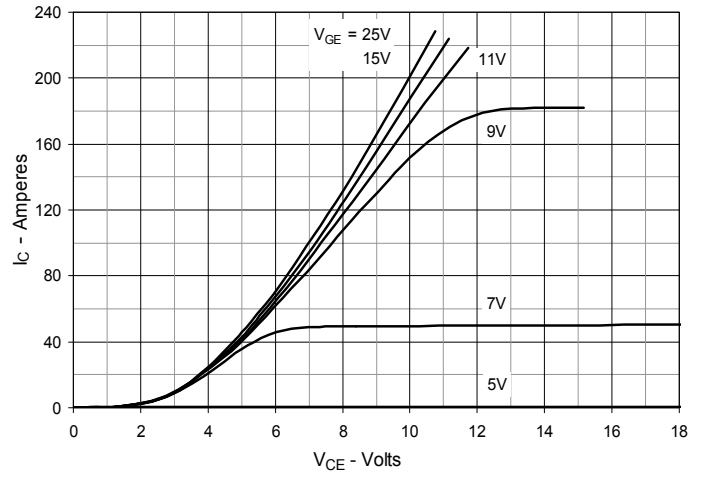
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

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	

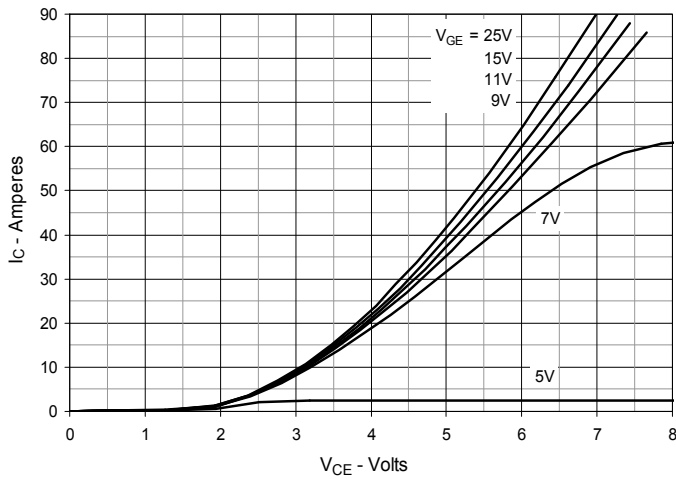
**Fig. 1. Output Characteristics @ 25°C**



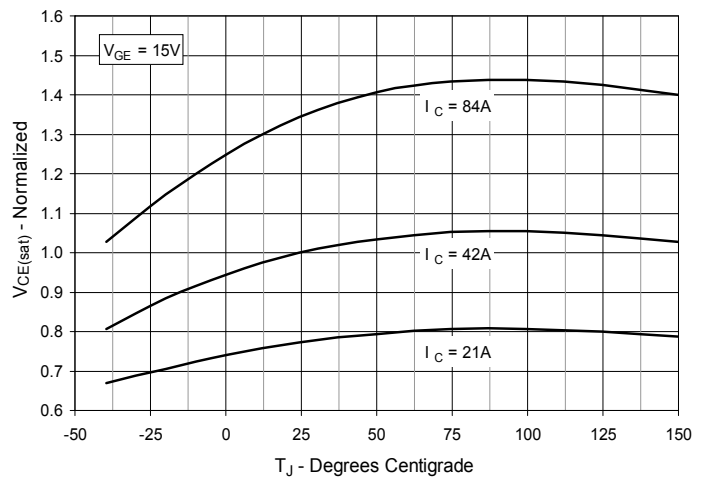
**Fig. 2. Extended Output Characteristics @ 25°C**



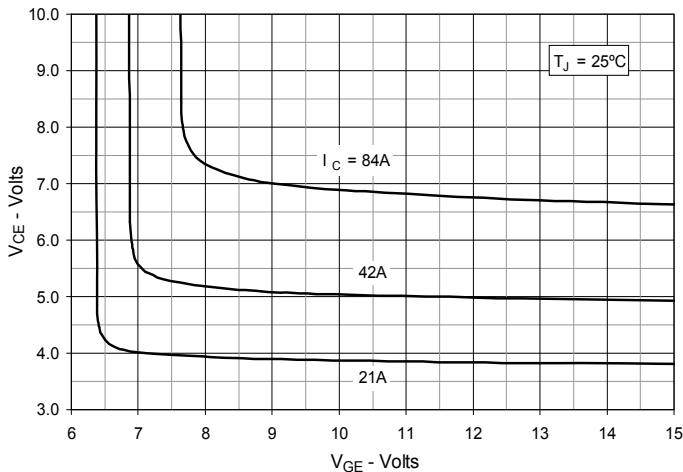
**Fig. 3. Output Characteristics @ 125°C**



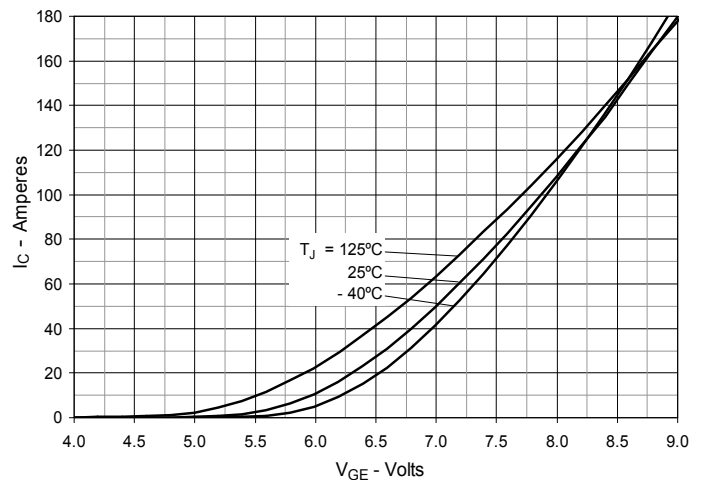
**Fig. 4. Dependence of VCE(sat) on Junction Temperature**

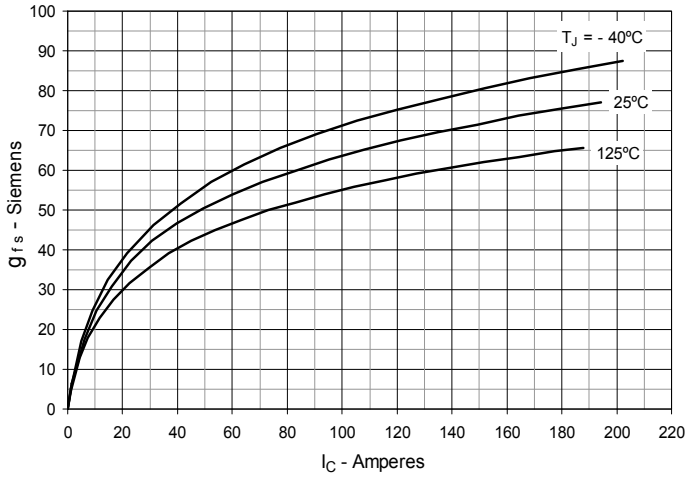
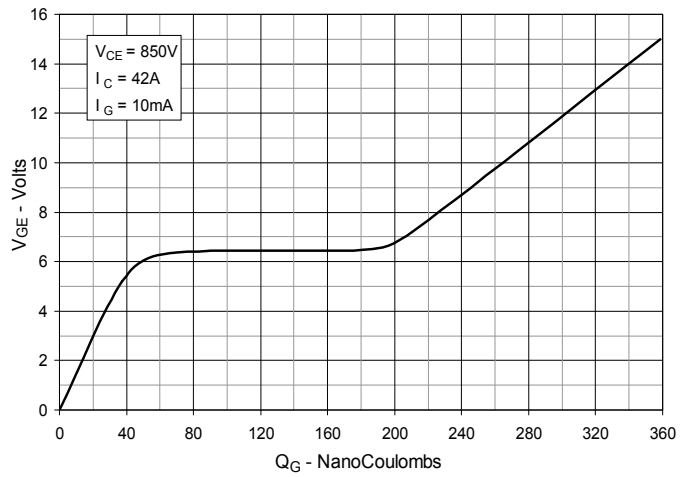
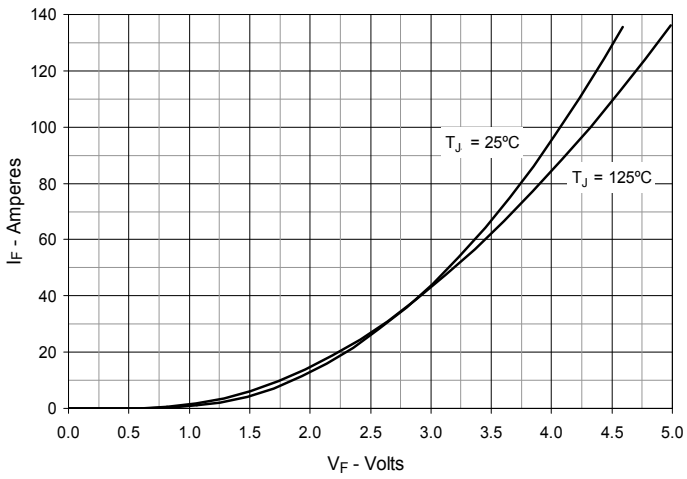
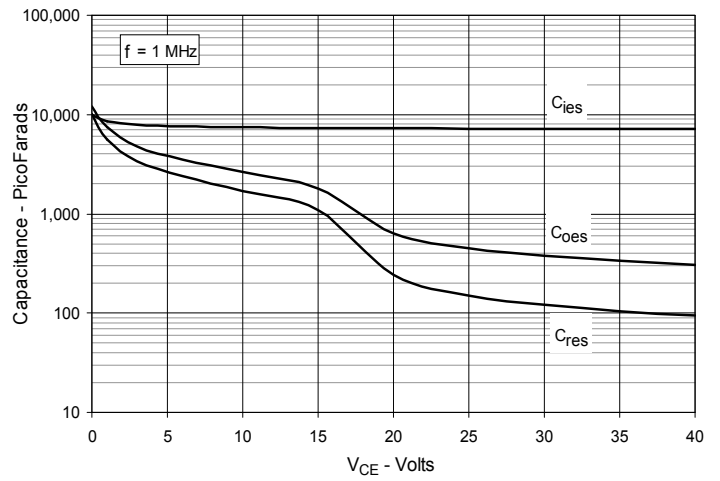
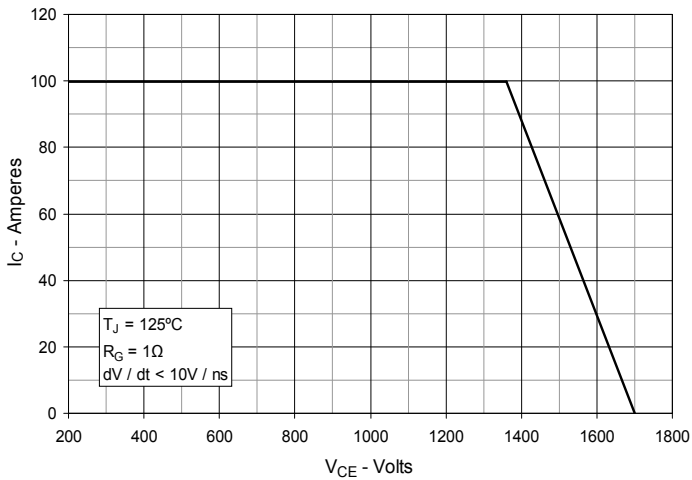
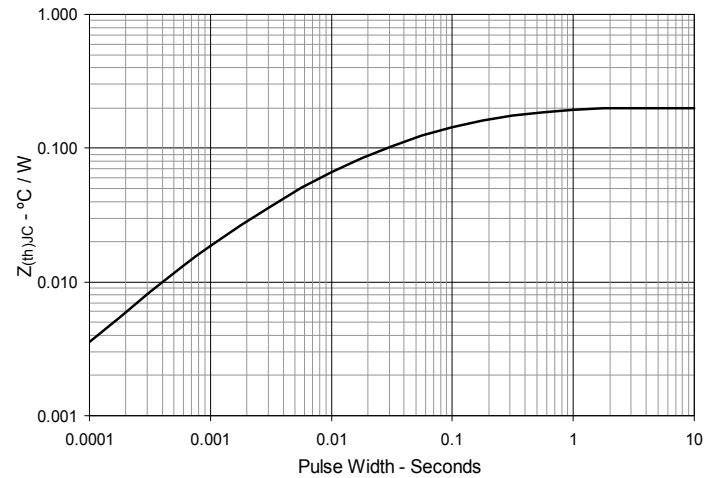


**Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage**

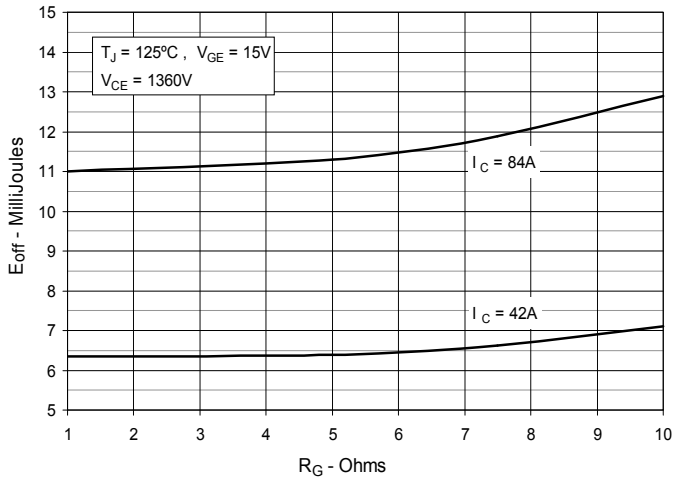


**Fig. 6. Input Admittance**

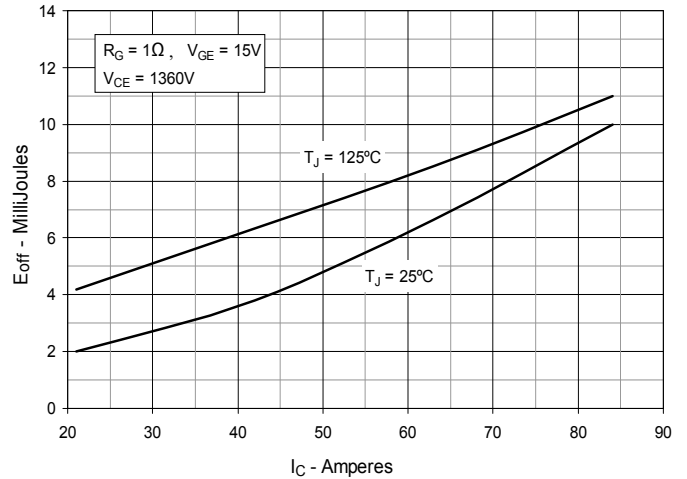


**Fig. 7. Transconductance**

**Fig. 8. Gate Charge**

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

**Fig. 10. Capacitance**

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

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


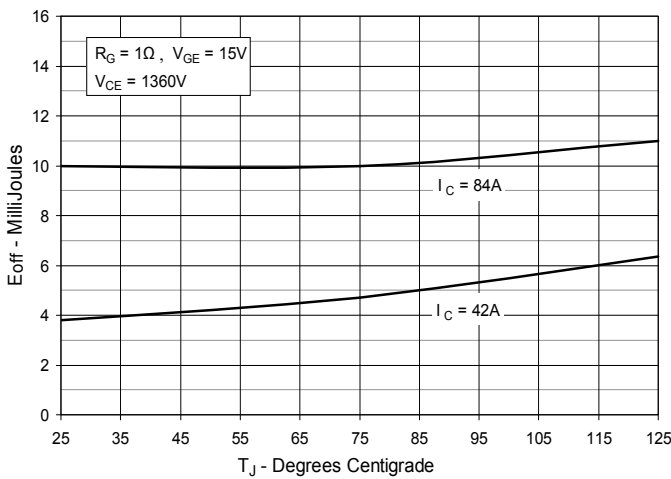
**Fig. 13. Inductive Turn-off**  
Switching Energy Loss vs. Gate Resistance



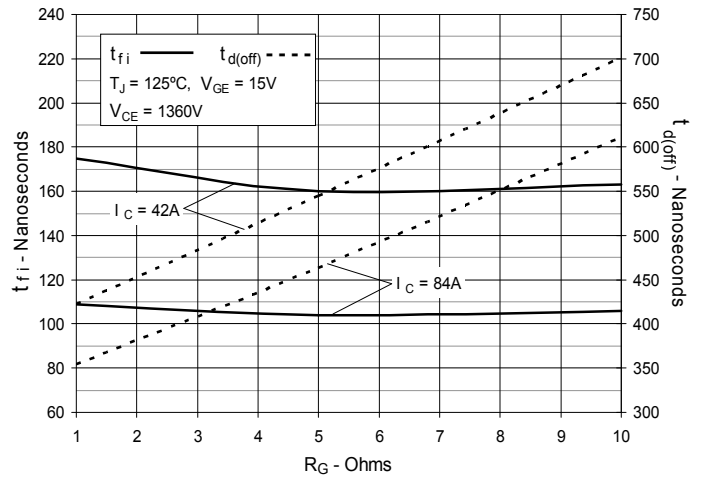
**Fig. 14. Inductive Turn-off**  
Switching Energy Loss vs. Collector Current



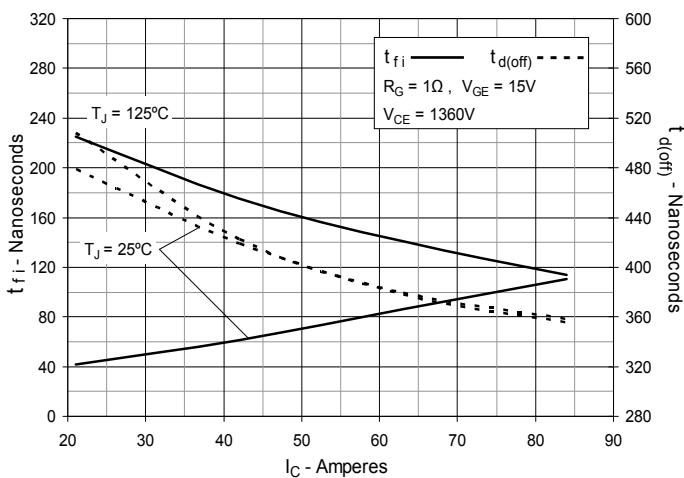
**Fig. 15. Inductive Turn-off**  
Switching Energy Loss vs. Junction Temperature



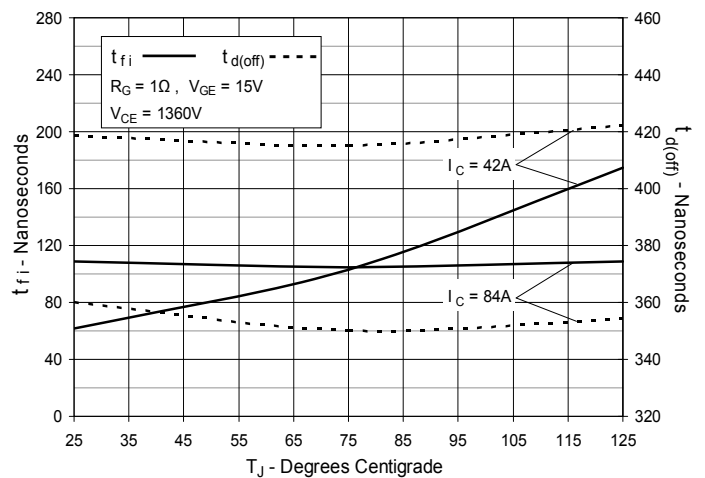
**Fig. 16. Inductive Turn-off**  
Switching Times vs. Gate Resistance



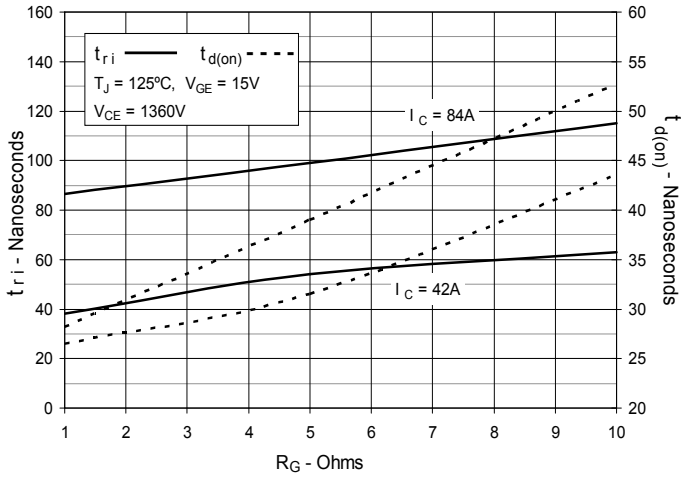
**Fig. 17. Inductive Turn-off**  
Switching Times vs. Collector Current



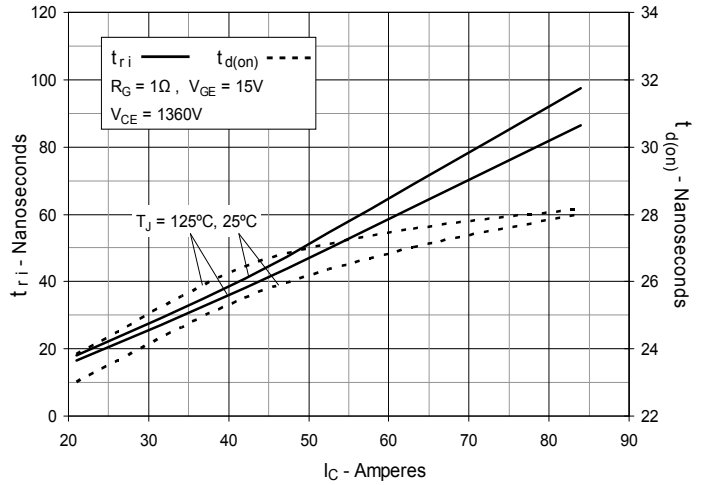
**Fig. 18. Inductive Turn-off**  
Switching Times vs. Junction Temperature



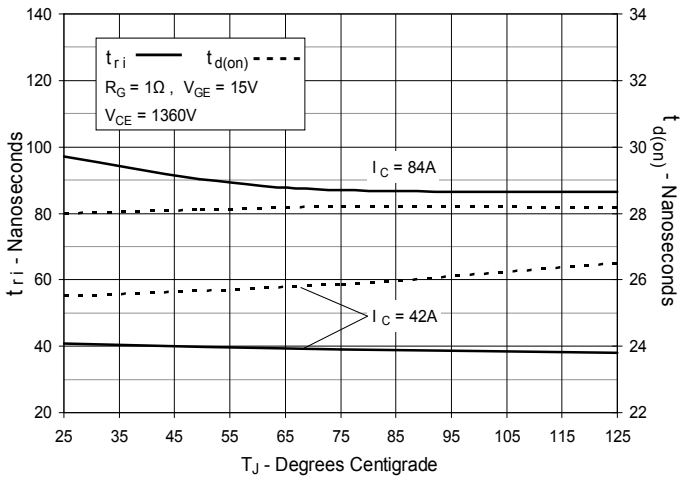
**Fig. 19. Inductive Turn-on  
Switching Times vs. Gate Resistance**



**Fig. 20. Inductive Turn-on  
Switching Times vs. Collector Current**



**Fig. 21. Inductive Turn-on  
Switching Times vs. Junction Temperature**



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