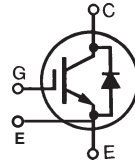


BiMOSFET™ Monolithic Bipolar MOS Transistor

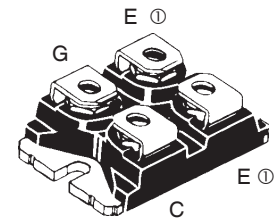
IXBN75N170A



$V_{CES} = 1700V$
 $I_{C90} = 42A$
 $V_{CE(sat)} \leq 6.00V$
 $t_{fi(typ)} = 60ns$

SOT-227B, miniBLOC

E153432



G = Gate, C = Collector, E = Emitter
 ① either emitter terminal can be used as Main or Kelvin Emitter

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	± 20	V
V_{GEM}	Transient	± 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
SSOA (RBSOA)	$V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 1\Omega$ Clamped Inductive Load	$I_{CM} = 100$ $V_{CE} \leq 0.8 \cdot V_{CES}$	A
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 T_{SOLD}	Maximum Lead Temperature for Soldering 1.6 mm (0.062 in.) from Case for 10	300 260	$^\circ C$ $^\circ C$
V_{ISOL}	50/60Hz $I_{ISOL} \leq 1mA$	$t = 1min$ $t = 1s$	2500 3000 V~ V~
M_d	Mounting Torque Terminal Connection Torque (M4)	1.5/13 1.3/11.5	Nm/lb.in. Nm/lb.in.
Weight		30	g

Features

- International Standard Package
- 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 MOSFET

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 μA 3 mA
I_{GES}	$V_{CE} = 0V$, $V_{GE} = \pm 20V$			± 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

Symbol	Test Conditions	Characteristic Values			
		Min.	Typ.	Max.	
g_{fS}	$I_C = I_{C90}, V_{CE} = 10V$, Note 1	28	48	S	
C_{ies}	$V_{CE} = 25V, V_{GE} = 0V, f = 1\text{MHz}$		7200	pF	
C_{oes}			450	pF	
C_{res}			150	pF	
Q_g	$I_C = I_{C90}, V_{GE} = 15V, V_{CE} = 0.5 \cdot V_{CES}$		358	nC	
Q_{ge}			46	nC	
Q_{gc}			148	nC	
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15V$ $V_{CE} = 0.8 \cdot V_{CES}, R_G = 1\Omega$ 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
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15V$ $V_{CE} = 0.8 \cdot V_{CES}, R_G = 1\Omega$ 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		$^\circ\text{C/W}$	

Reverse Diode

Symbol Test Conditions

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

Characteristic Values

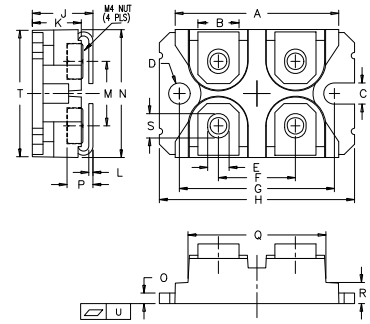
Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
V_F	$I_F = I_{C90}, V_{GE} = 0V$, Note 1			5.5 V
t_{rr}	$I_F = I_{C90}, V_{GE} = 0V, -di_F/dt = 100A/\mu\text{s}$		360	ns
I_{RM}			19	A
Q_{RM}		$V_R = 100V, V_{GE} = 0V$		3.5

Notes:

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

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

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

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
	4,860,072	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 @ $T_J = 25^\circ\text{C}$

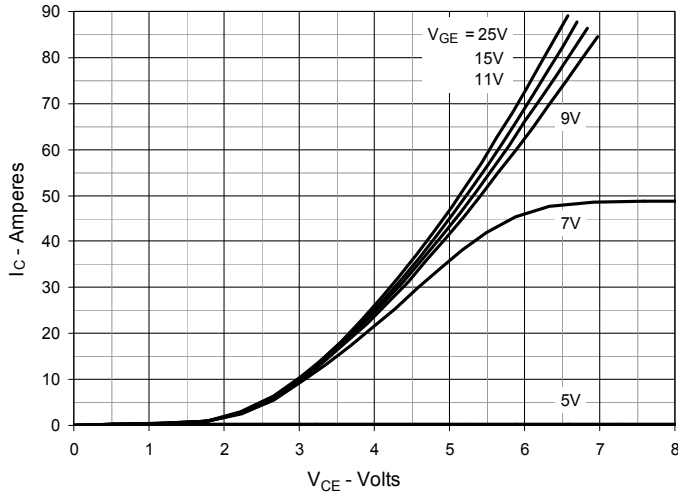


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

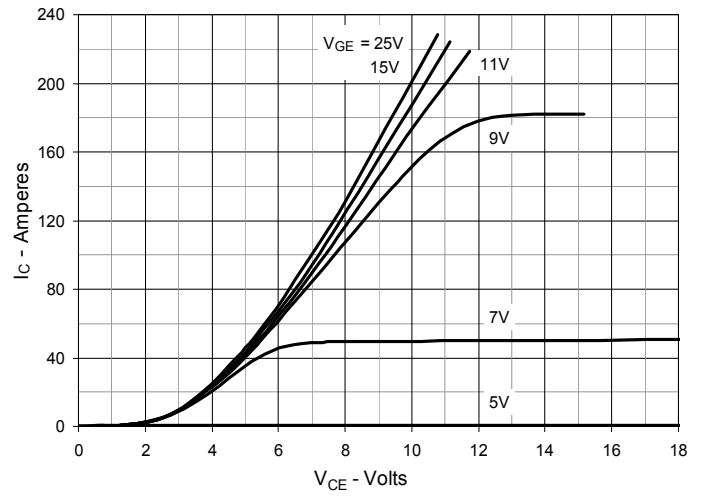


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

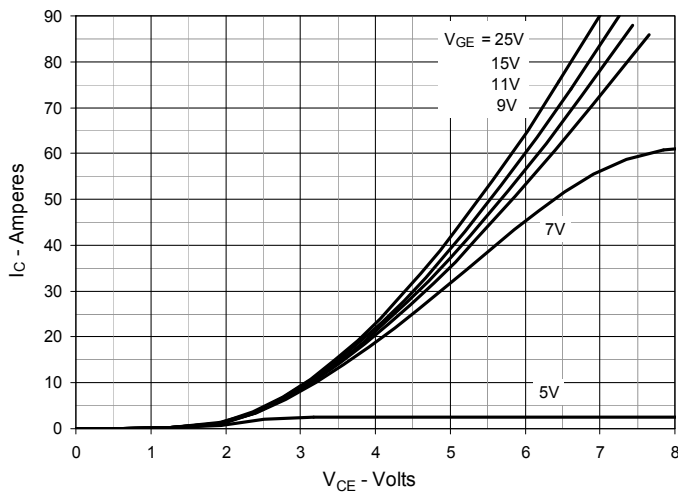


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

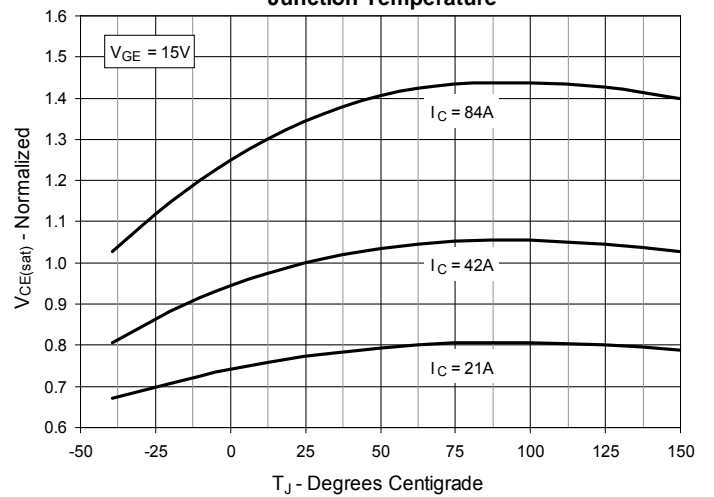


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

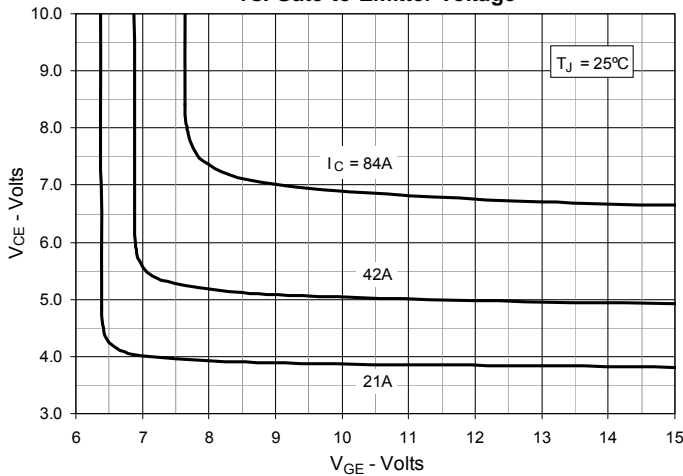


Fig. 6. Input Admittance

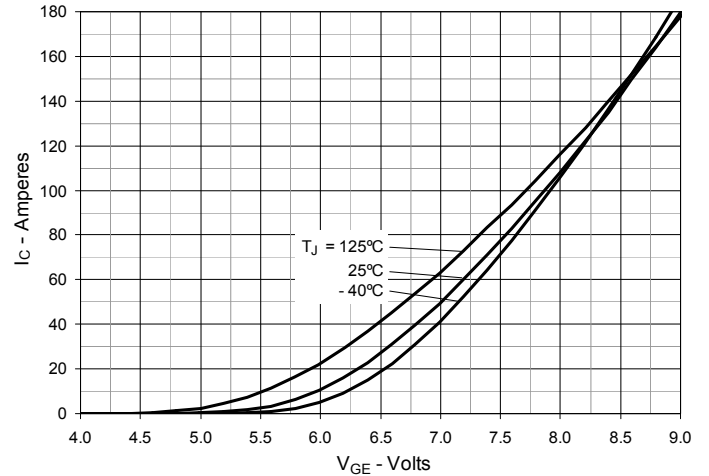
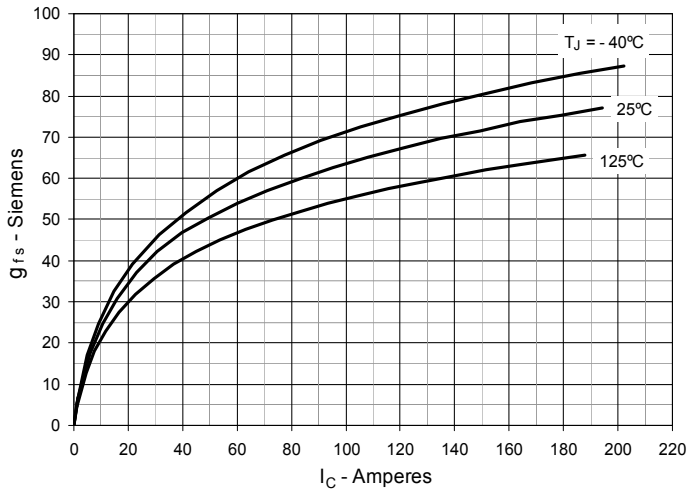
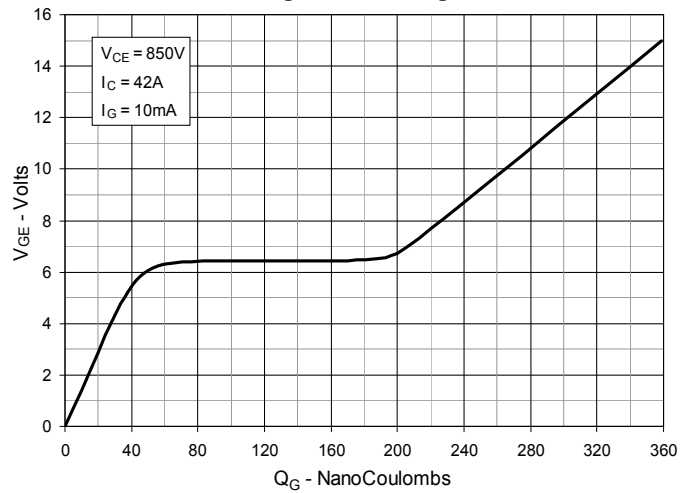
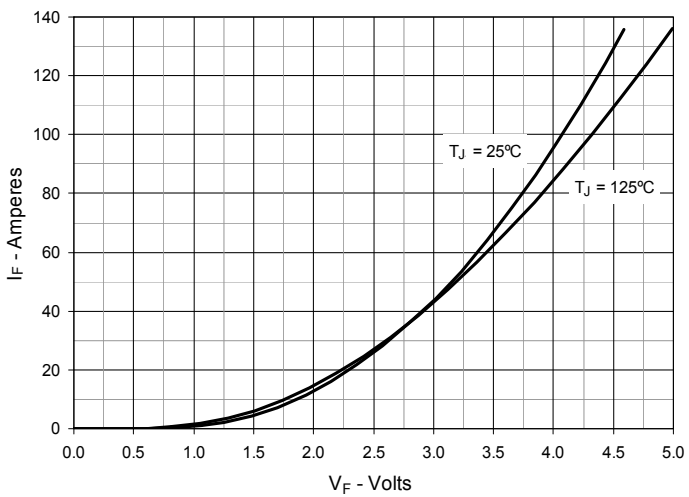
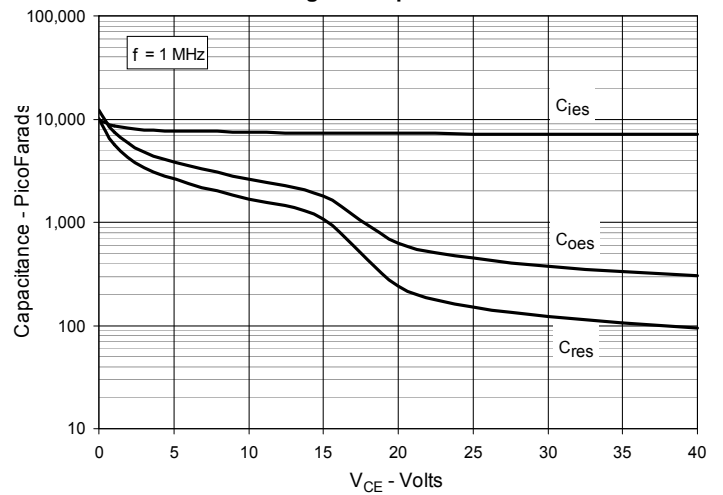
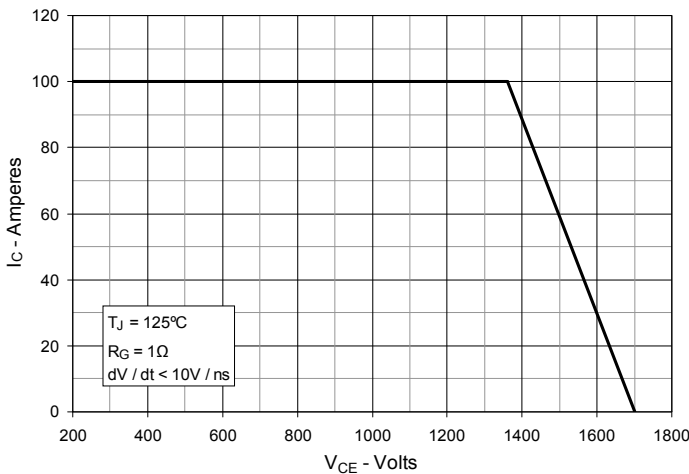
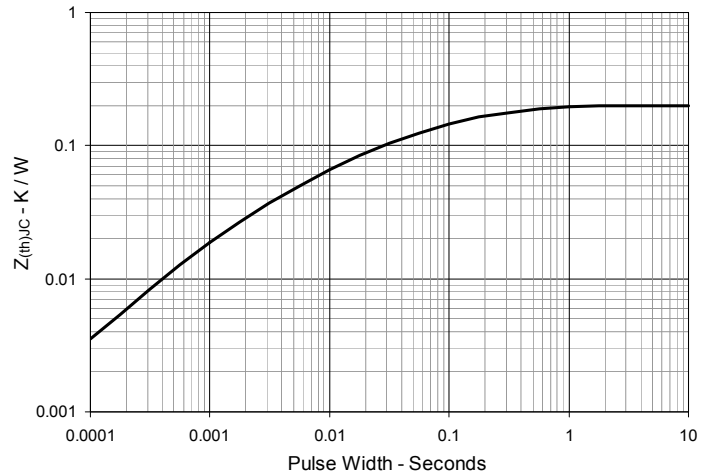
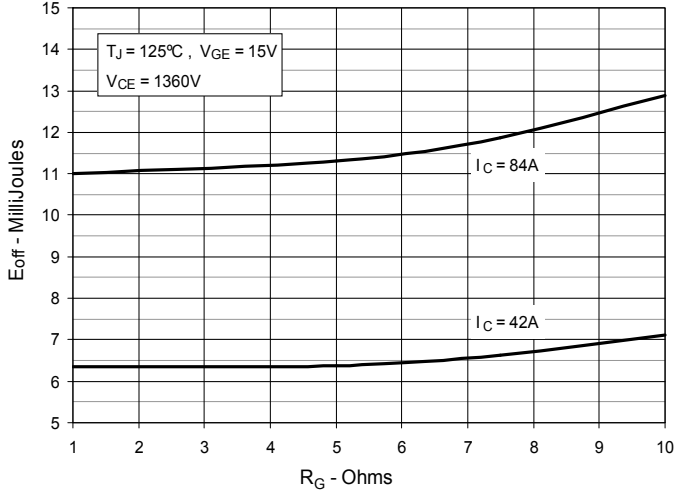
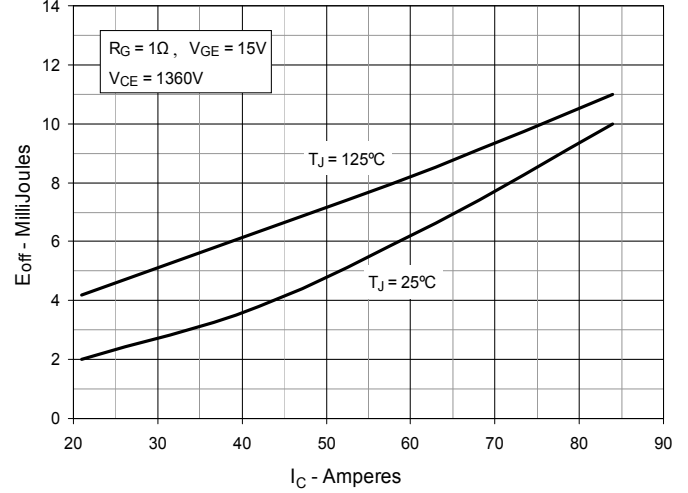


Fig. 7. Transconductance

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


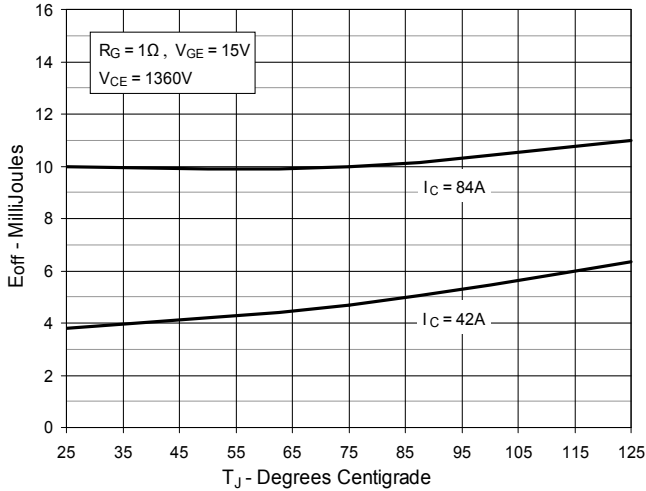
**Fig. 13. Inductive Turn-off
Switching Energy Loss vs. Gate Resistance**



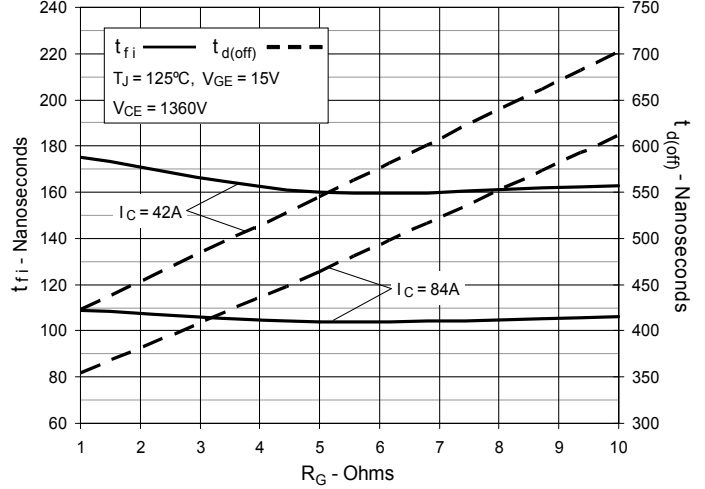
**Fig. 14. Inductive Turn-off
Switching Energy Loss vs. Collector Current**



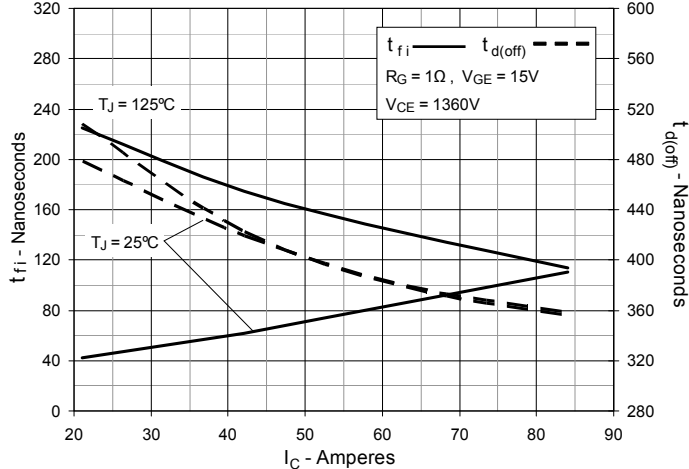
**Fig. 15. Inductive Turn-off
Switching Energy Loss vs. Junction Temperature**



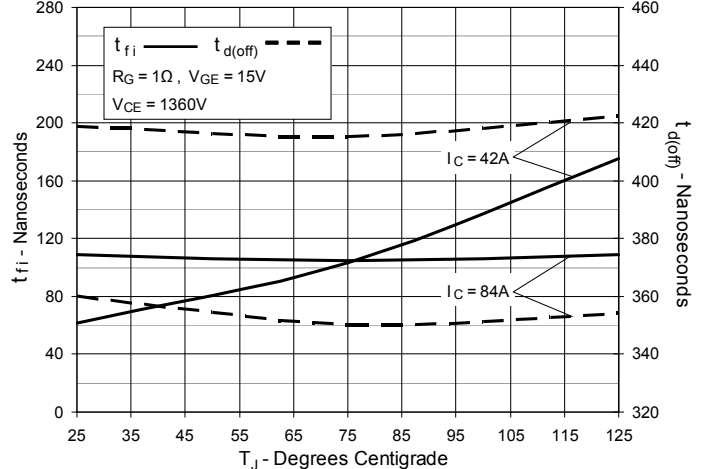
**Fig. 16. Inductive Turn-off
Switching Times vs. Gate Resistance**

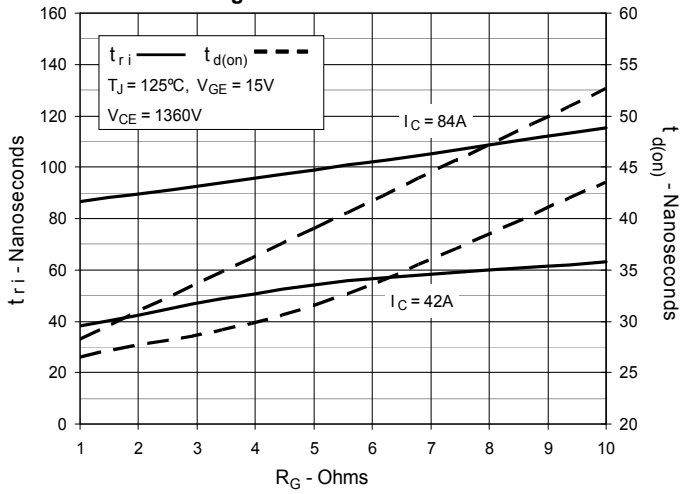
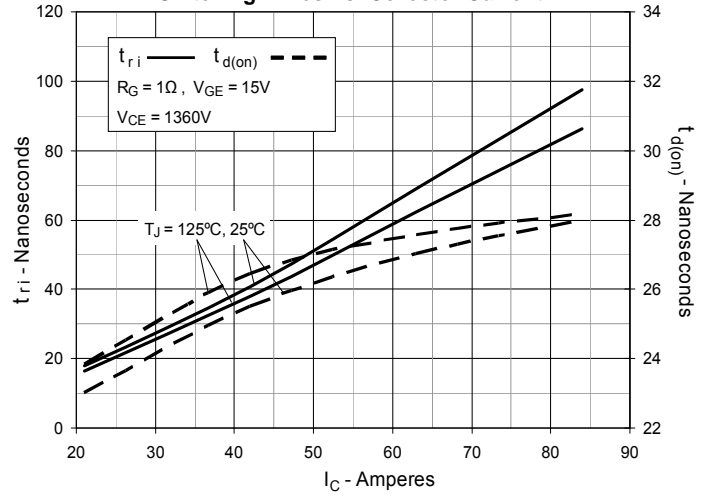
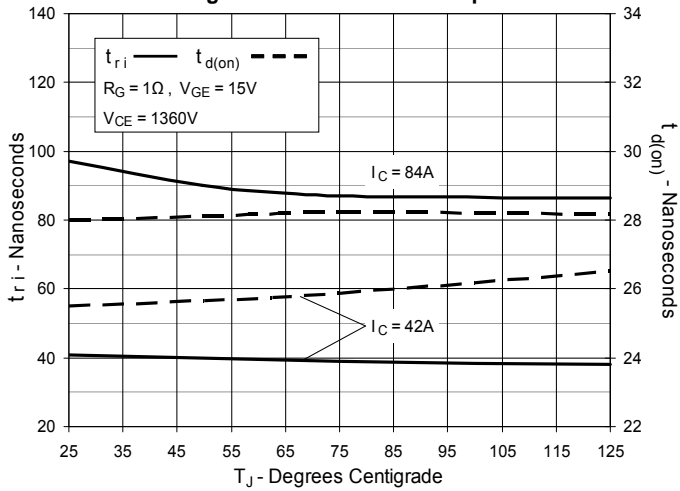


**Fig. 17. Inductive Turn-off
Switching Times vs. Collector Current**



**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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[M0#T2](#) [IKP20N60TXKSA1](#)