Advance Technical Information

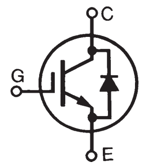
High Voltage, High Gain BiMOSFET™

IXBL64N250

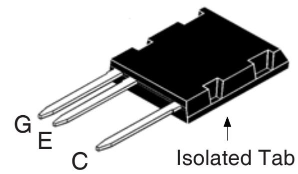
V_{CES} = 2500V
I_{C110} = 46A
$V_{CE(sat)}$ ≤ 3.0V

Monolithic Bipolar MOS Transistor

(Electrically Isolated Tab)



ISOPLUS i5-Pak™



G = Gate C = Collector
E = Emitter

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	2500	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	2500	V
V_{GES}	Continuous	±25	V
V_{GEM}	Transient	±35	V
I_{C25}	T_C = 25°C	116	A
I_{C110}	T_C = 110°C	46	A
I_{CM}	T_C = 25°C, 1ms	750	A
SSOA (RBSOA)	V_{GE}= 15V, T_{VJ} = 125°C, R_G = 1Ω Clamped Inductive Load	I_{CM} = 160 $V_{CE} \le 0.8 \bullet V_{CES}$	A
T_{SC} (SCSOA)	V_{GE} = 15V, T_J = 125°C R_G = 5Ω, V_{CE} = 1250V, Non-Repetitive	10	µs
P_C	T_C = 25°C	500	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062 in.) from Case for 10	260	°C
V_{ISOL}	50/60Hz, 1 minute	2500	V~
F_C	Mounting Force with Clip	30..170 / 7..36	Nm/lb-in.
Weight		8	g

Symbol	Test Conditions (T_J = 25°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 • V_{CES}, V_{GE} = 0V			50	µA
	Note 2, T_J = 125°C			6	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 25V			±200	nA
$V_{CE(sat)}$	I_C = 64A, V_{GE} = 15V, Note 1		2.5	3.0	V
	T_J = 125°C		3.1		V

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 2500V~ Electrical Isolation
- High Blocking Voltage
- Low Switching Losses
- High Current Handling Capability
- Anti-Parallel Diode

Advantages

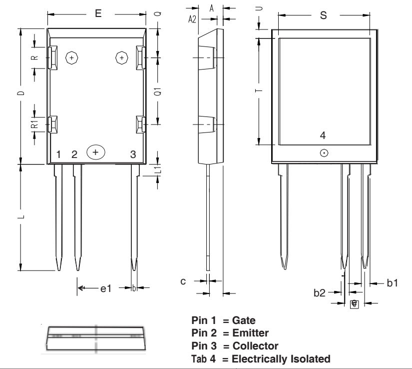
- High Power Density
- Low Gate Drive Requirement

Applications

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

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fS}	I_C = 64A, V_{CE} = 10V, Note 1	40	72		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		8900		pF
C_{oes}			345		pF
C_{res}			118		pF
Q_g	I_C = 64A, V_{GE} = 15V, V_{CE} = 600V		400		nC
Q_{ge}			46		nC
Q_{gc}			155		nC
$t_{d(on)}$	**Resistive Switching Times, T_J = 25°C**		49		ns
t_r	I_C = 128A, V_{GE} = 15V		318		ns
$t_{d(off)}$	V_{CE} = 1250V, R_G = 1Ω		232		ns
t_f			170		ns
$t_{d(on)}$	**Resistive Switching Times, T_J = 125°C**		54		ns
t_r	I_C = 128A, V_{GE} = 15V		578		ns
$t_{d(off)}$	V_{CE} = 1250V, R_G = 1Ω		222		ns
t_f			175		ns
R_{thJC}				0.25	°C/W
R_{thCS}			0.15		°C/W

ISOPLUS i5-Pak[TM] HV (IXBL) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETER MIN	MILLIMETER MAX
A	0.190	0.205	4.83	5.21
A1	0.102	0.118	2.59	3.00
A2	0.046	0.055	1.17	1.40
b	0.045	0.055	1.14	1.40
b1	0.063	0.072	1.60	1.83
b2	0.058	0.068	1.47	1.73
c	0.020	0.029	0.51	0.74
D	1.020	1.040	25.91	26.42
E	0.770	0.799	19.56	20.29
e	0.150 BSC		3.81 BSC	
e1	0.450 BSC		11.43 BSC	
L	0.780	0.820	19.81	20.83
L1	0.080	0.102	2.03	2.59
Q	0.210	0.235	5.33	5.97
Q1	0.490	0.513	12.45	13.03
R	0.150	0.180	3.81	4.57
R1	0.100	0.130	2.54	3.30
S	0.668	0.690	16.97	17.53
T	0.801	0.821	20.34	20.85
U	0.065	0.080	1.65	2.03

Reverse Diode

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max	
V_F	I_F = 64A, V_{GE} = 0V, Note 1			3.0	V
t_{rr}	I_F = 64A, V_{GE} = 0V, -di_F/dt = 650A/μs		160		ns
I_{RM}	V_R = 600V, V_{GE} = 0V		480		A

Notes:
1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.
2. Part must be heatsunk for high-temp Ices measurement.

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

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

IXYS MOSFETs and IGBTs are covered by one or moreof the following U.S. patents: 4,835,592 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ T_J = 25ºC

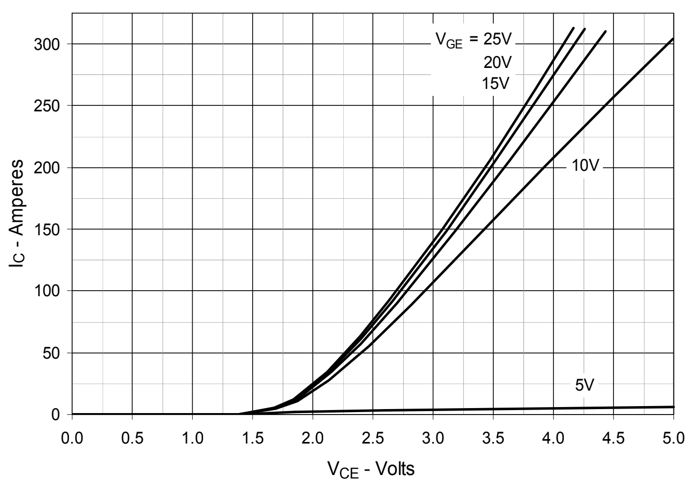


Fig. 2. Output Characteristics @ T_J = 125ºC

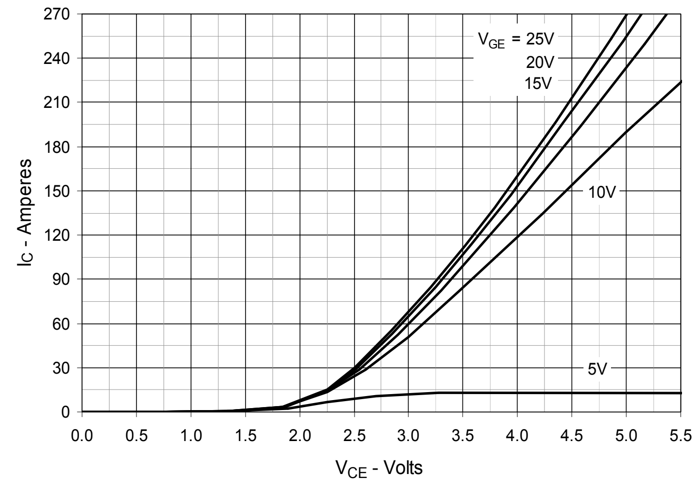


Fig. 3. Dependence of $V_{CE(sat)}$ on Junction Temperature

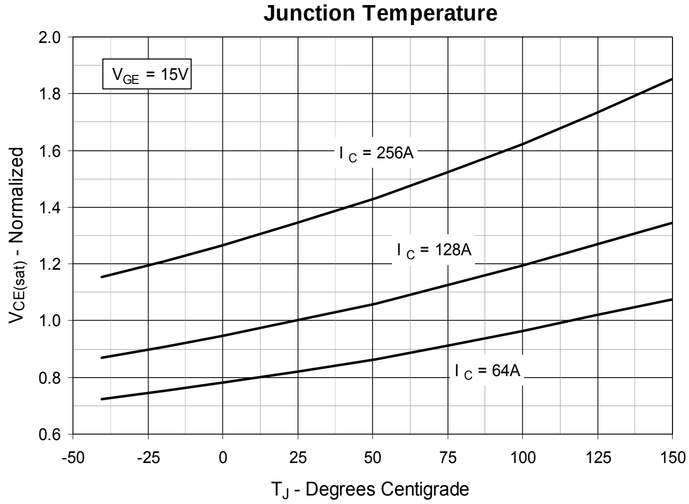


Fig. 4. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

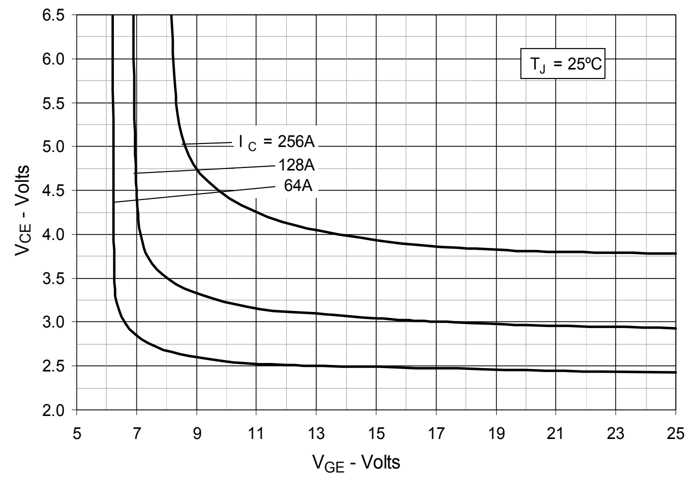


Fig. 5. Breakdown & Threshold Voltages vs. Junction Temperature

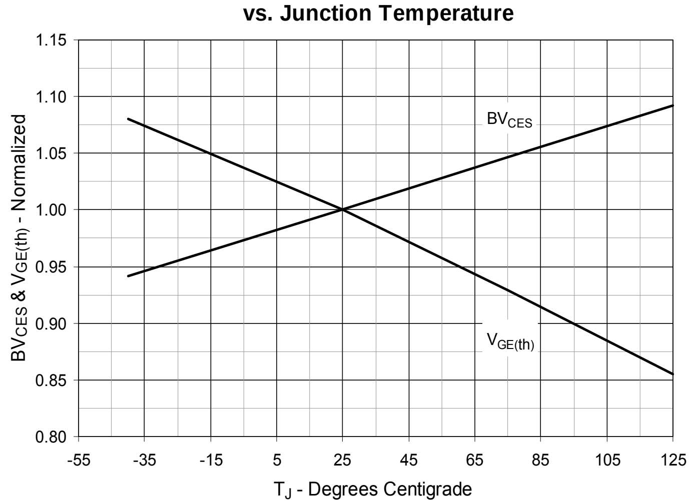


Fig. 6. Input Admittance

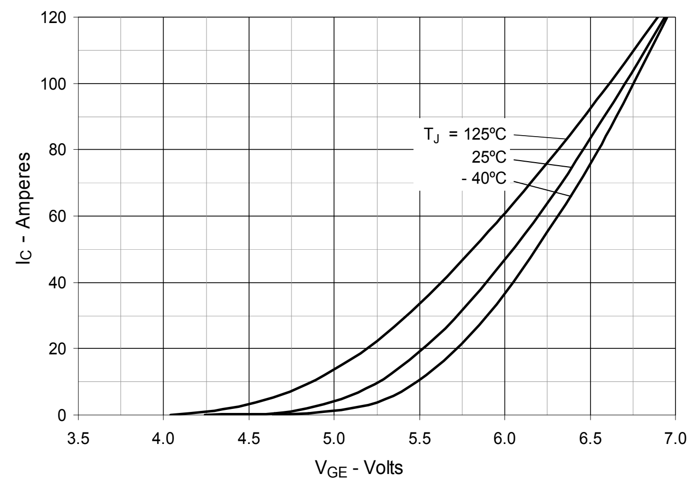


Fig. 7. Transconductance

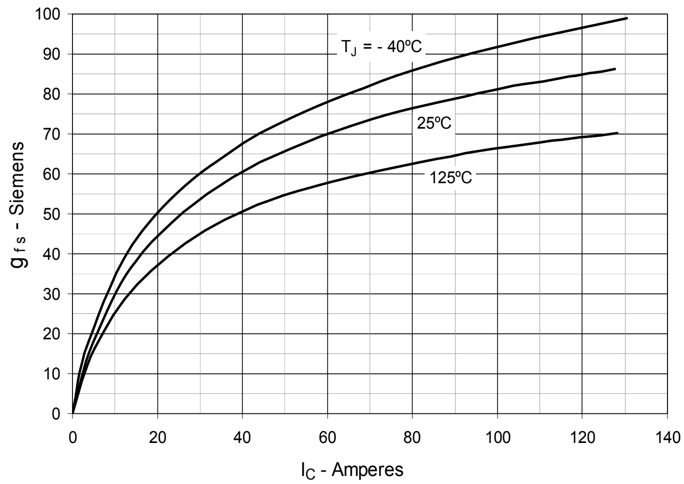


Fig. 8. Forward Voltage Drop of Intrinsic Diode

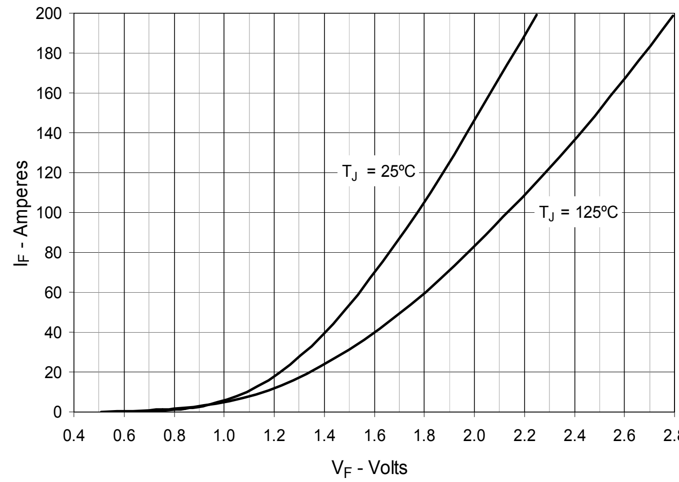


Fig. 9. Gate Charge

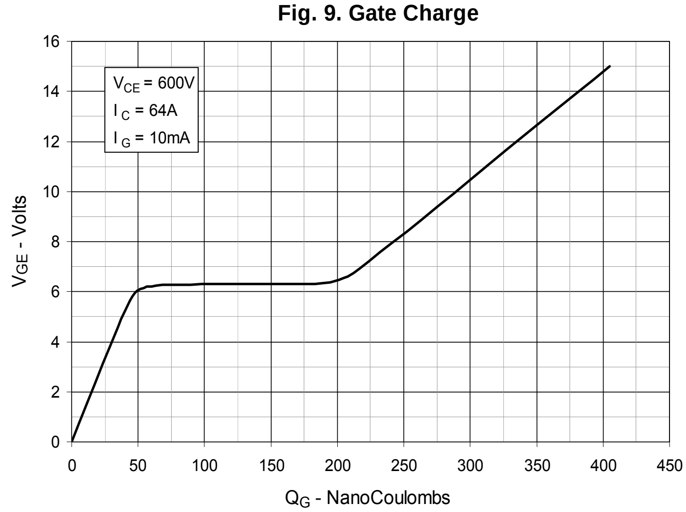


Fig. 10. Capacitance

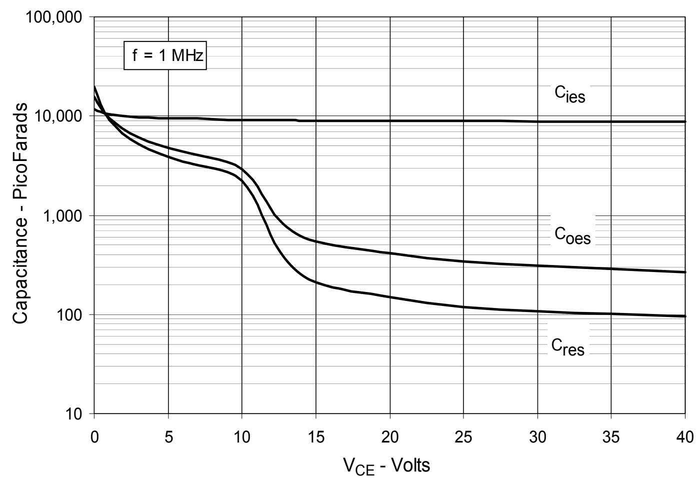


Fig. 11. Reverse-Bias Safe Operating Area

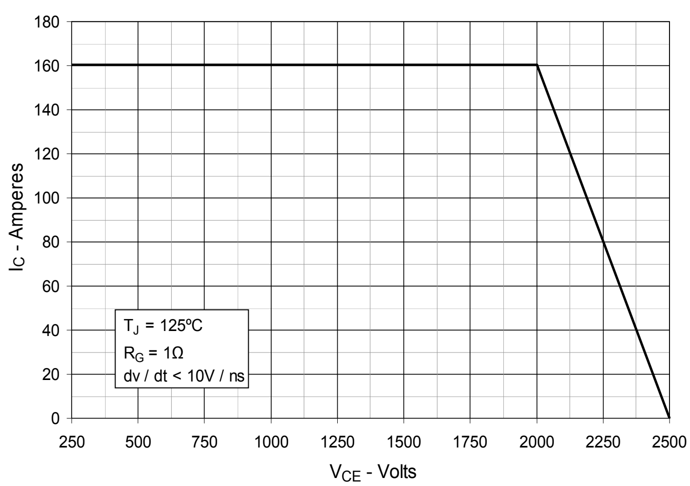
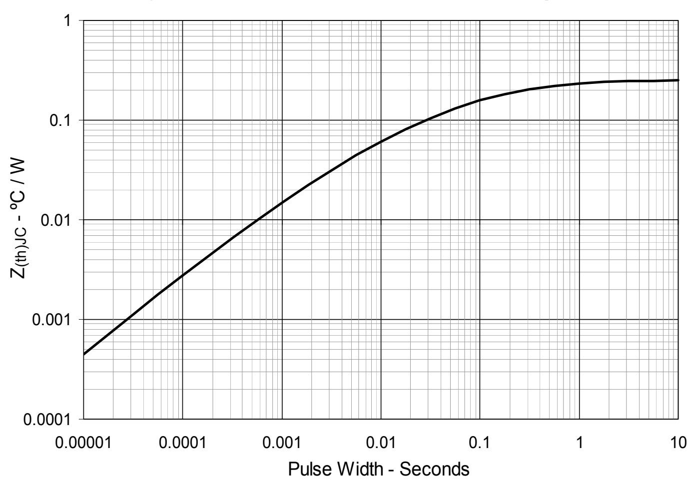


Fig. 12. Maximum Transient Thermal Impedance



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

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

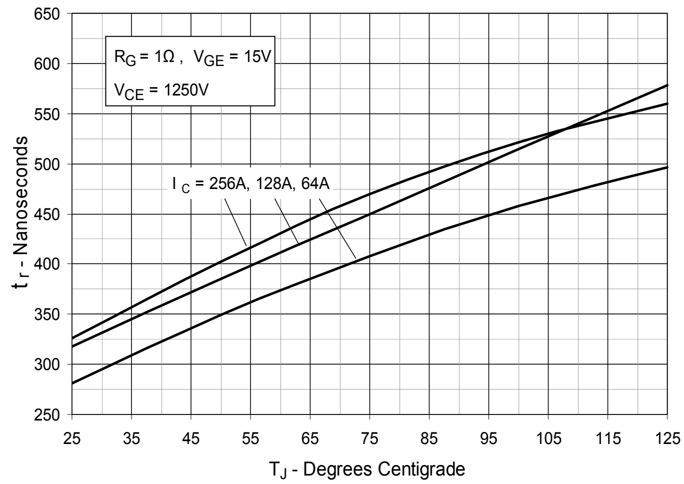


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

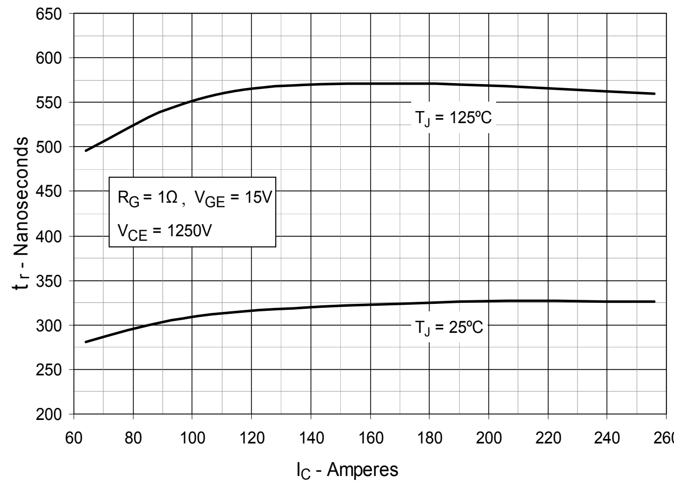


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

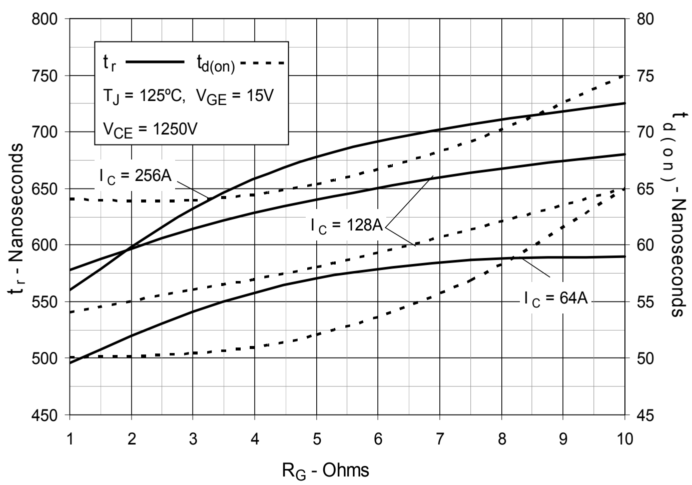


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

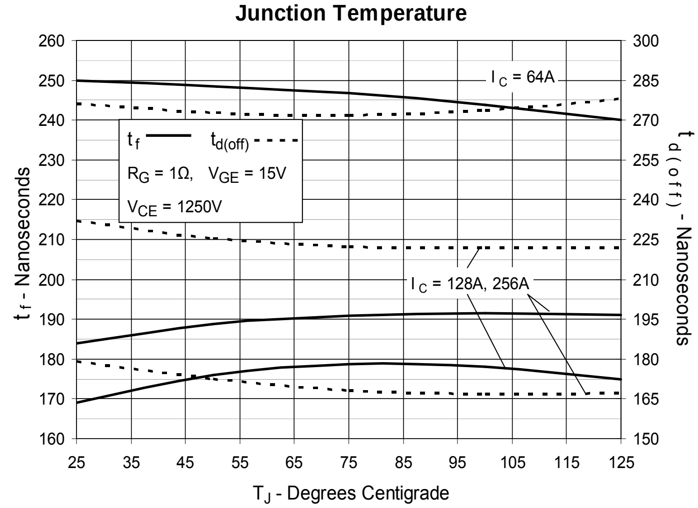


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

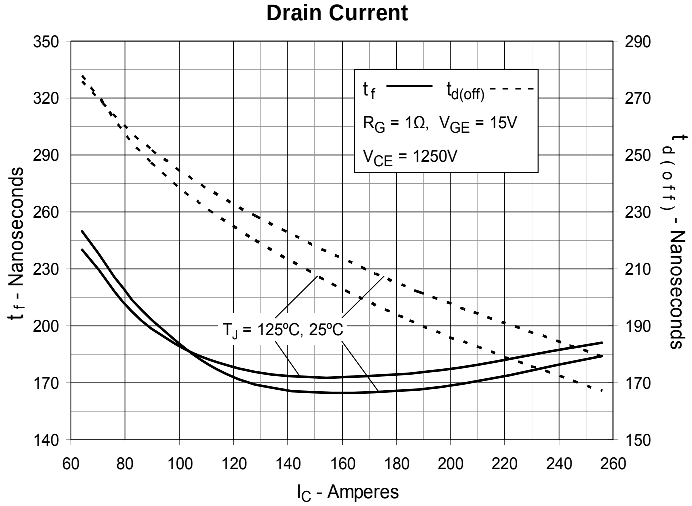


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance