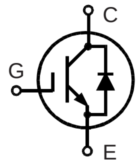
High Voltage BIMOSFET™ Monolithic Bipolar MOS Transistor

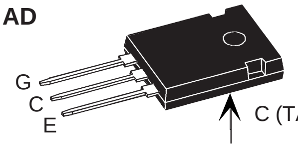
IXBH 9N140G
IXBH 9N160G

V_{CES} = 1400/1600 V
I_{C25} = 9 A
$V_{CE(sat)}$ = 4.9 V typ.
t_{fi} = 70 ns

N-Channel, Enhancement Mode
MOSFET compatible



TO-247 AD



G = Gate, C = Collector,
E = Emitter, TAB = Collector

Preliminary Data

Symbol	Conditions	Maximum Ratings 9N140G	9N160G	
V_{CES}	T_J = 25°C to 150°C	1400	1600	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	1400	1600	V
V_{GES}	Continuous		±20	V
V_{GEM}	Transient		±30	V
I_{C25}	T_C = 25°C,		9	A
I_{C90}	T_C = 90°C		5	A
I_{CM}	T_C = 25°C, 1 ms		10	A
SSOA (RBSOA)	V_{GE}= 10 V, T_{VJ} = 125°C, R_G = 27 Ω V_{CE} = 0.8•V_{CES} Clamped inductive load, L = 100 µH		I_{CM} = 12	A
P_C	T_C = 25°C		100	W
T_J			-55 ... +150	°C
T_{JM}			150	°C
T_{stg}			-55 ... +150	°C
T_L	1.6 mm (0.063 in) from case for 10 s		300	°C
M_d	Mounting torque		1.15/10	Nm/lb.in.
Weight			6	g

Symbol	Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 0.25 mA, V_{GE} = 0 V	9N140G 9N160G	1400 1600			V V
$V_{GE(th)}$	I_C = 0.5 mA, V_{CE} = V_{GE}		3.5		5.5	V
I_{CES}	V_{CE} = 0.8 • V_{CES} V_{GE} = 0 V	T_J = 25°C T_J = 125°C		 0.1	100	µA mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				± 500	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15 V	 T_J = 125°C		4.9 5.6	7	V V

Features

- High Voltage BIMOSFET™
  - replaces high voltage Darlingtons and series connected MOSFETs
  - lower effective $R_{DS(on)}$
- MOS Gate turn-on
  - drive simplicity
  - MOSFET compatible for 10V turn on gate voltage
- Monolithic construction
  - high blocking voltage capability
  - very fast turn-off characteristics
- International standard package JEDEC TO-247 AD
- Reverse conducting capability

Applications

- Flyback converters
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- CRT deflection
- Lamp ballasts

Advantages

- Easy to mount with 1 screw (isolated mounting screw hole)
- Space savings
- High power density

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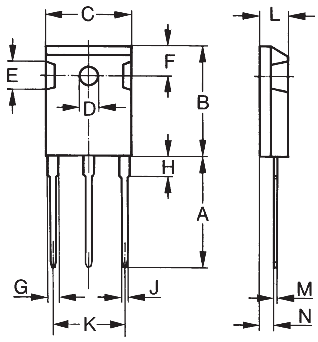
Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		550	pF
C_{oes}			36	pF
C_{res}			5	pF
Q_g	I_C = 5 A, V_{CE} = 600 V, V_{GE} = 10 V		34	nC
$t_{d(on)}$	**Inductive load, T_J = 125°C**		140	ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 10 V, L = 100 µH,		200	ns
$t_{d(off)}$	V_{CE} = 960 V, R_G = 27 Ω		120	ns
t_{fi}			70	ns
R_{thJC}				1.25 K/W
R_{thCK}			0.25	K/W

TO-247 AD Outline



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

Reverse Conduction — **Characteristic Values** (T_J = 25°C, unless otherwise specified)

Symbol	Conditions	min.	typ.	max.
V_F	$I_F = I_{C90}$, V_{GE} = 0 V		3.6	5

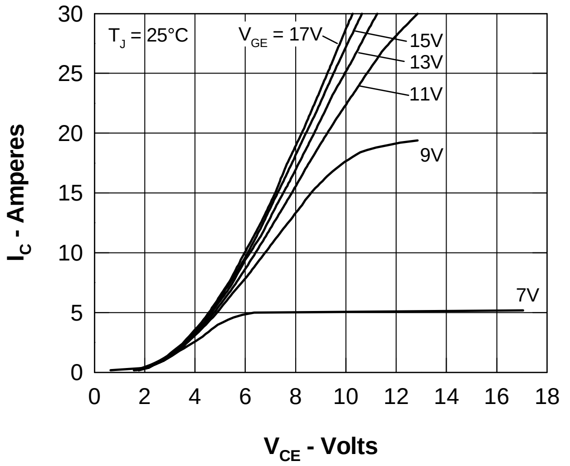


Fig. 1 Typ. Output Characteristics

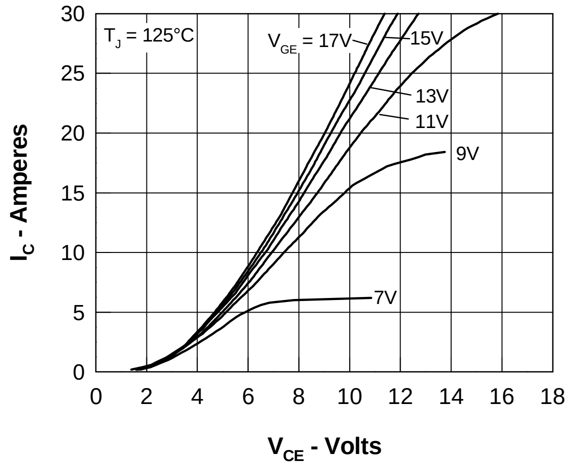


Fig. 2 Typ. Output Characteristics

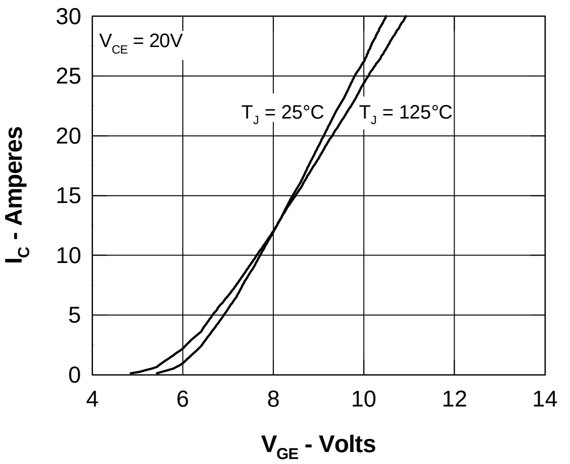


Fig. 3 Typ. Transfer Characteristics

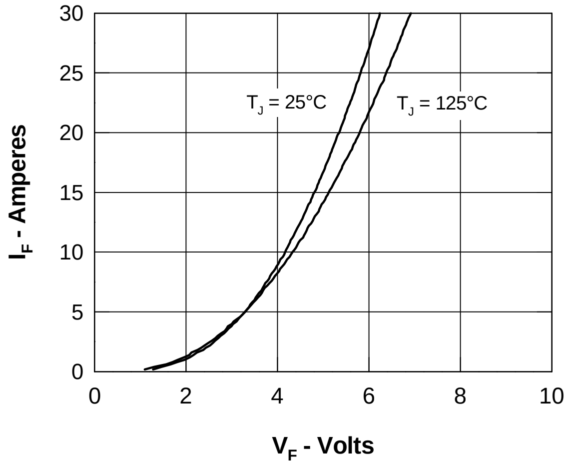


Fig. 4 Typ. Characteristics of Reverse Conduction

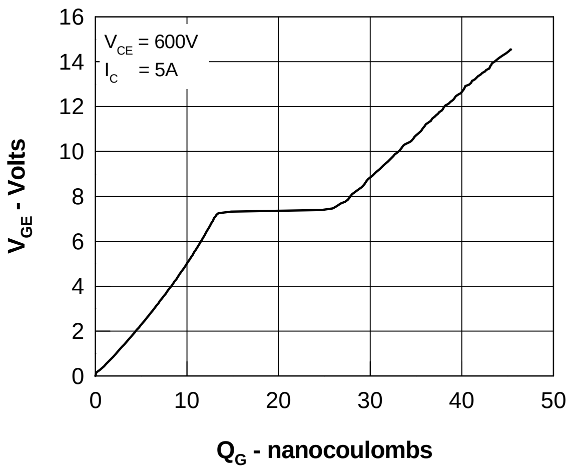


Fig. 5 Typ. Gate Charge characteristics

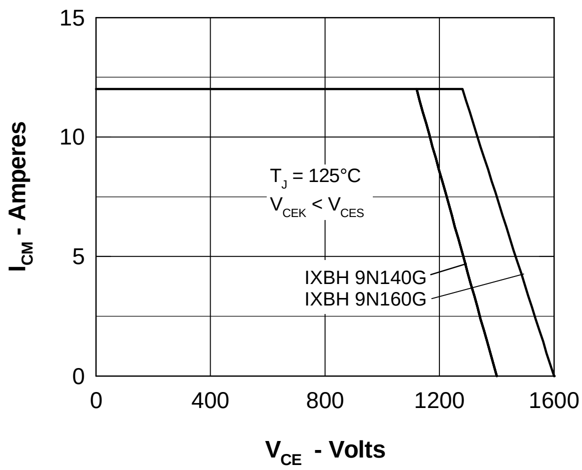


Fig. 6 Reverse Biased Safe Operating Area RBSOA

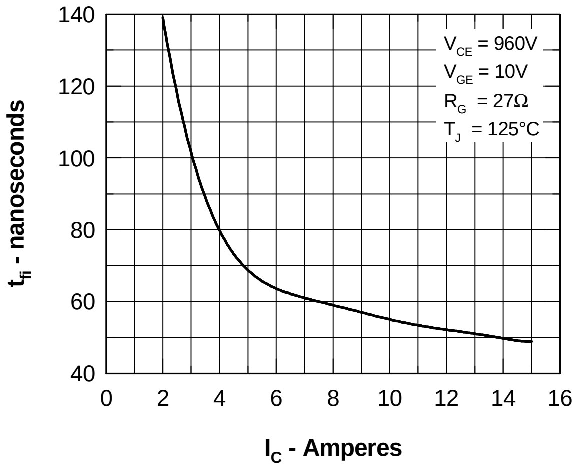


Fig. 7 Typ. Fall Time

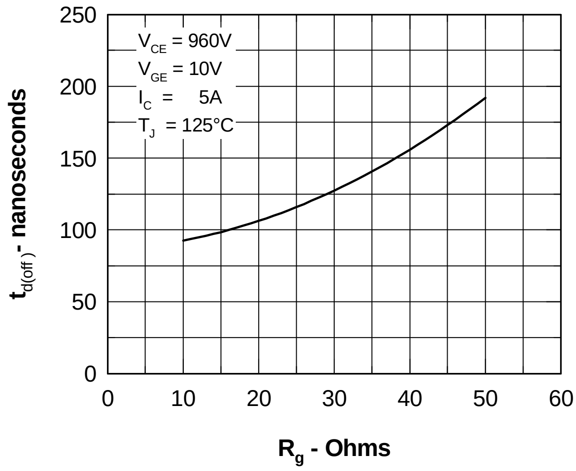


Fig. 8 Typ. Turn Off Delay Time

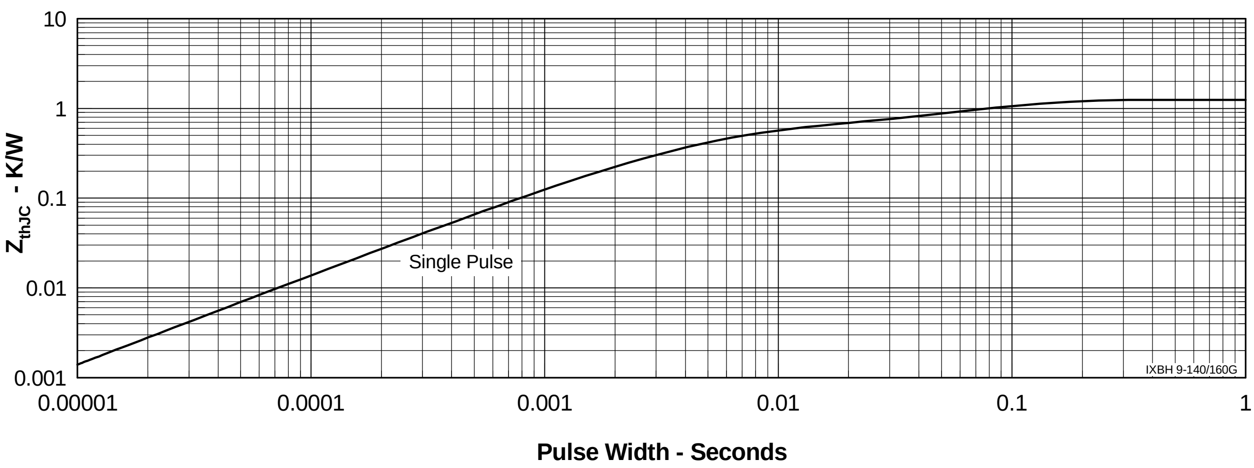


Fig. 9 Typ. Transient Thermal Impedance