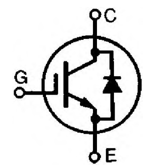
IXYS

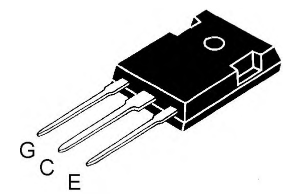
		V_{CES}	I_{C25}	$V_{CE(sat)}$
Low $V_{CE(sat)}$ IGBT with Diode	IXGH 17 N100U1	1000 V	34 A	3.5 V
High speed IGBT with Diode	IXGH 17 N100AU1	1000 V	34 A	4.0 V

Combi Packs



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1000	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	1000	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	34	A
I_{C90}	T_C = 90°C	17	A
I_{CM}	T_C = 25°C, 1 ms	68	A
SSOA (RBSOA)	V_{GE}= 15 V, T_{VJ} = 125°C, R_G = 82 Ω Clamped inductive load, L = 100 µH	I_{CM} = 34 @ 0.8 V_{CES}	A
P_C	T_C = 25°C	150	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
M_d	Mounting torque (M3)	1.13/10	Nm/lb.in.
Weight		6	g
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C

TO-247 AD



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

Features

- International standard package JEDEC TO-247 AD
- IGBT and anti-parallel FRED in one package
- 2nd generation HDMOS™ process
- Low $V_{CE(sat)}$
  - for minimum on-state conduction losses
- MOS Gate turn-on
  - drive simplicity
- Fast Recovery Epitaxial Diode (FRED)
  - soft recovery with low I_{RM}

Applications

- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies

Advantages

- Saves space (two devices in one package)
- Easy to mount (isolated mounting screw hole)
- Reduces assembly time and cost

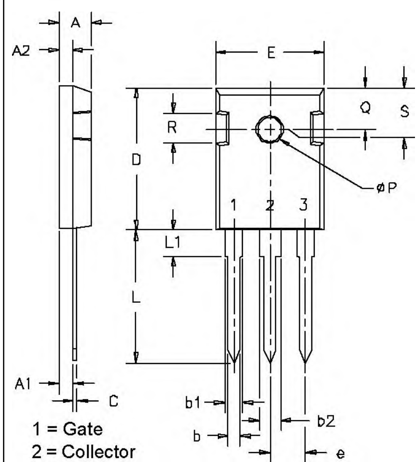
Characteristic Values (T_J = 25°C, unless otherwise specified)

Symbol	Test Conditions		min.	typ.	max.	
BV_{CES}	I_C = 4.5 mA, V_{GE} = 0 V		1000			V
$V_{GE(th)}$	I_C = 500 µA, V_{CE} = V_{GE}		2.5		5.5	V
I_{CES}	V_{CE} = 0.8 • V_{CES}	T_J = 25°C			500	µA
	V_{GE} = 0 V	T_J = 125°C			8	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15 V	17N100U1			3.5	V
		17N100AU1			4.0	V

Characteristic Values ($T_J = 25°C$, unless otherwise specified)

Symbol	Test Conditions		min.	typ.	max.	
g_{fs}	$I_C = I_{C90}$; $V_{CE} = 10$ V, Pulse test, $t \leq 300$ µs, duty cycle ≤ 2 %		6	15		S
C_{ies}	$V_{CE} = 25$ V, $V_{GE} = 0$ V, f = 1 MHz			1500		pF
C_{oes}				210		pF
C_{res}				40		pF
Q_g	$I_C = I_{C90}$, $V_{GE} = 15$ V, $V_{CE} = 0.5\ V_{CES}$			100	120	nC
Q_{ge}				20	30	nC
Q_{gc}				60	90	nC
$t_{d(on)}$	**Inductive load, $T_J = 25°C$**			100		ns
t_{ri}	$I_C = I_{C90}$, $V_{GE} = 15$ V, L = 300 µH,			200		ns
$t_{d(off)}$	$V_{CE} = 0.8\ V_{CES}$, $R_G = R_{off} = 82\ \Omega$			500	1000	ns
t_{fi}	Remarks: Switching times may increase	17N100U1		750		ns
	for V_{CE} (Clamp) > 0.8 • V_{CES},	17N100AU1		450	750	ns
E_{off}	higher T_J or increased R_G	17N100AU1		3		mJ
$t_{d(on)}$	**Inductive load, $T_J = 125°C$**			100		ns
t_{ri}	$I_C = I_{C90}$, $V_{GE} = 15$ V, L = 300 µH			200		ns
E_{on}	$V_{CE} = 0.8\ V_{CES}$, $R_G = R_{off} = 82\ \Omega$			2.5		mJ
$t_{d(off)}$	Remarks: Switching times may increase			700	1000	ns
t_{fi}	for V_{CE} (Clamp) > 0.8 • V_{CES},	17N100U1		1200	2000	ns
	higher T_J or increased R_G	17N100AU1		750	1000	ns
E_{off}		17N100U1		8		mJ
		17N100AU1		6		mJ
R_{thJC}					0.83	K/W
R_{thCK}				0.25		K/W

TO-247 AD Outline



1 = Gate
2 = Collector
3 = Emitter
Tab = Collector

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.209	4.7	5.3
A_1	.087	.102	2.2	2.54
A_2	.059	.098	2.2	2.6
b	.040	.055	1.0	1.4
b_1	.065	.084	1.65	2.13
b_2	.113	.123	2.87	3.12
C	.016	.031	.4	.8
D	.819	.845	20.80	21.46
E	.610	.640	15.75	16.26
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1		.177		4.50
øP	.140	.144	3.55	3.65
Q	.212	.244	5.4	6.2
R	.170	.216	4.32	5.49
S	.242 BSC		6.15 BSC	

Reverse Diode (FRED)

Characteristic Values ($T_J = 25°C$, unless otherwise specified)

Symbol	Test Conditions		min.	typ.	max.	
V_F	$I_F = I_{C90}$, $V_{GE} = 0$ V, Pulse test, $t \leq 300$ µs, duty cycle d ≤ 2 %				2.5	V
I_{RM}	$I_F = I_{C90}$, $V_{GE} = 0$ V, $-di_F/dt = 240$ A/µs			16	18	A
t_{rr}	$V_R = 540$ V	$T_J = 125°C$		120		ns
	$I_F = 1$ A; $-di/dt = 100$ A/µs; $V_R = 30$ V	$T_J = 25°C$		35	50	ns
R_{thJC}					1	K/W

IXYS MOSFETS and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

Fig. 1 Saturation Characteristics

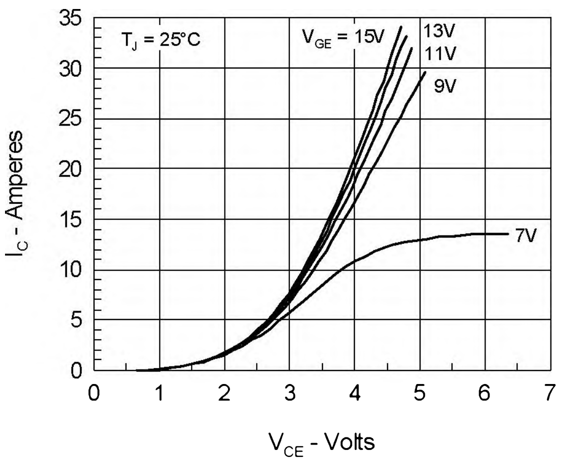


Fig. 2 Output Characterstics

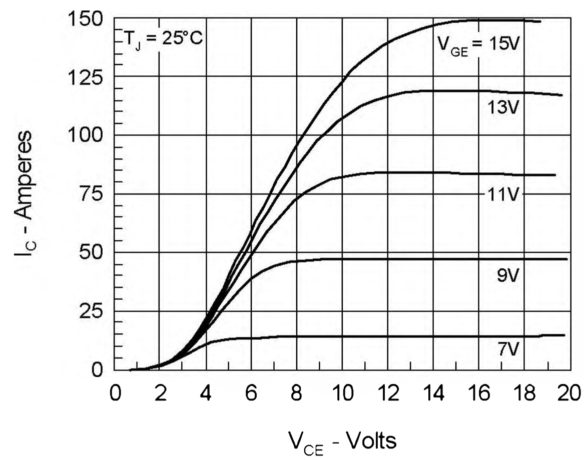


Fig. 3 Collector-Emitter Voltage vs. Gate-Emitter Voltage

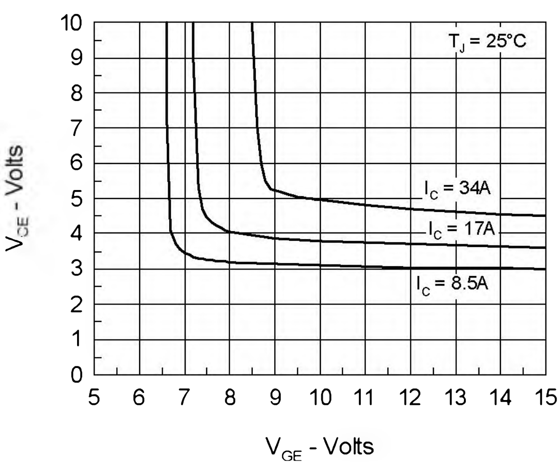


Fig. 4 Temperature Dependence of Output Saturation Voltage

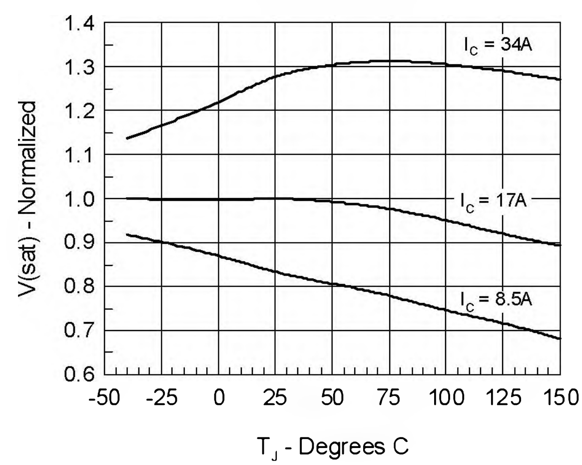


Fig. 5 Input Admittance

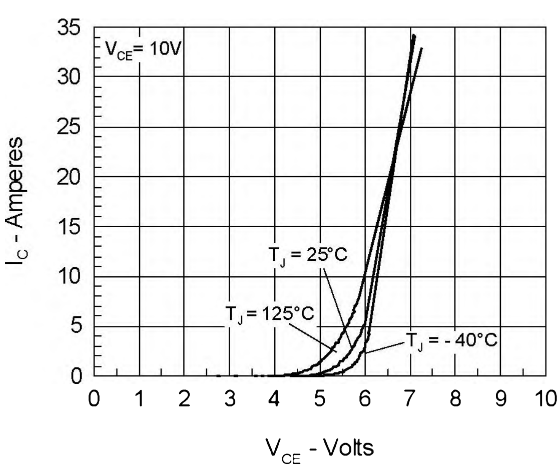


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

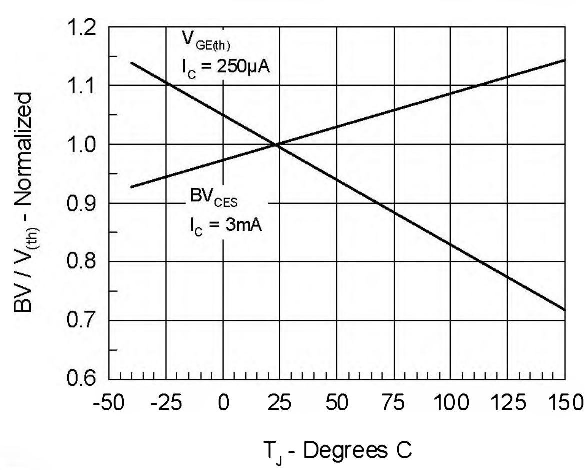


Fig.7 Gate Charge

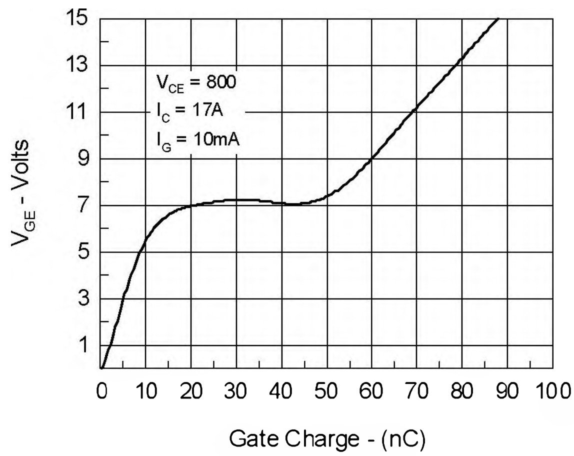


Fig.8 Turn-Off Safe Operating Area

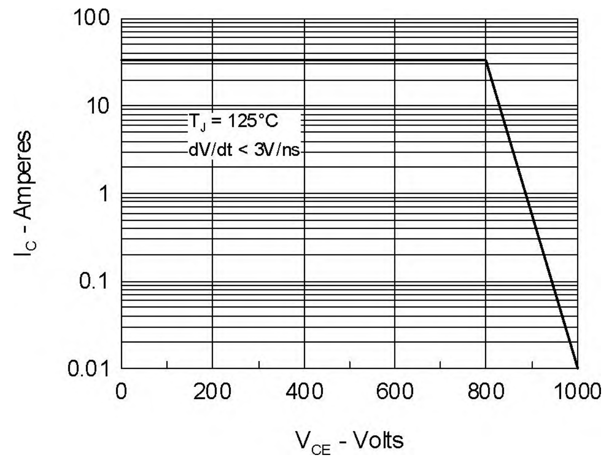


Fig.9 Capacitance Curves

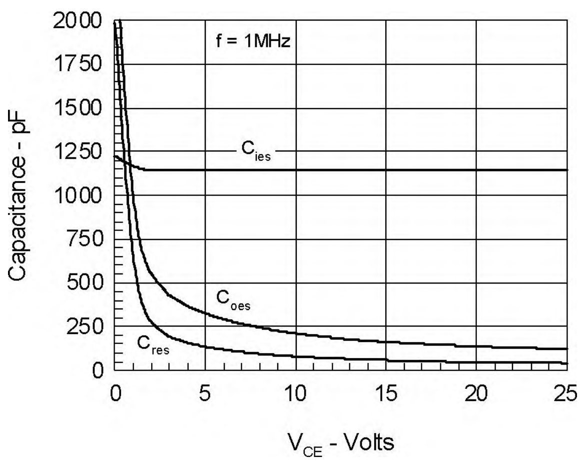


Fig.10 Transient Thermal Impedance

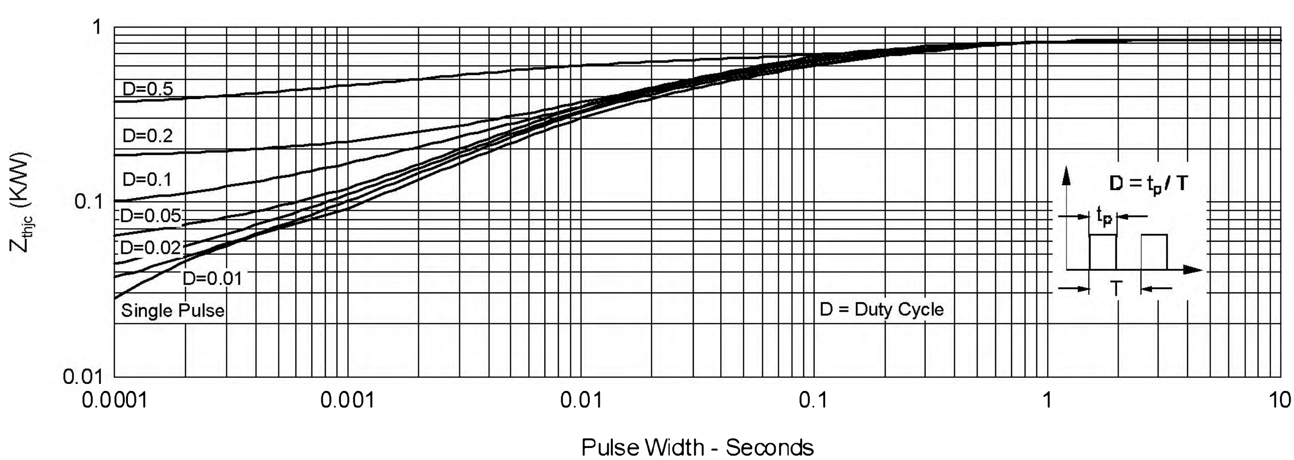


Fig.11 Maximum Forward Voltage Drop

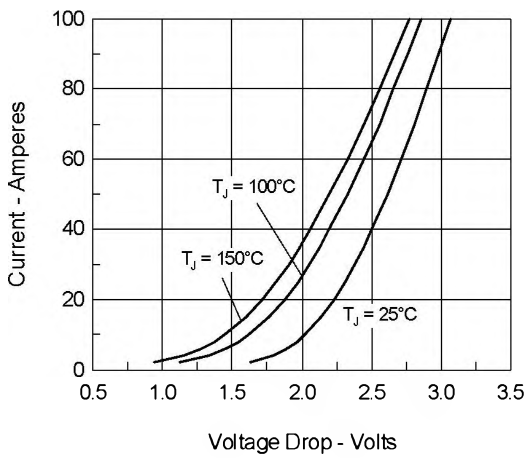


Fig.12 Peak Forward Voltage V_{FR} and Forward Recovery Time t_{FR}

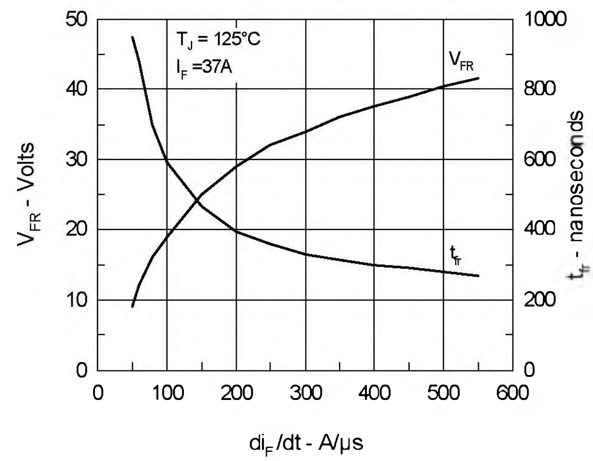


Fig.13 Junction Temperature Dependence off I_{RM} and Q_r

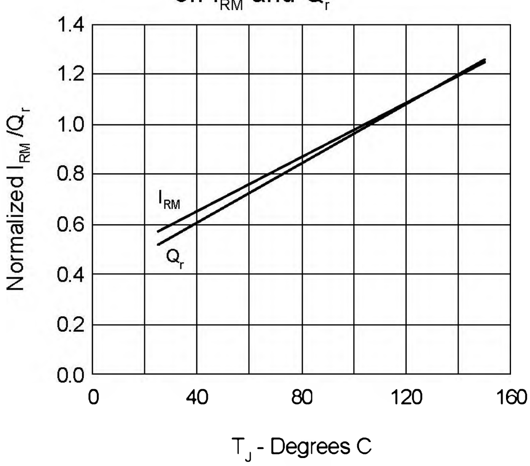


Fig.14 Reverse Recovery Chargee

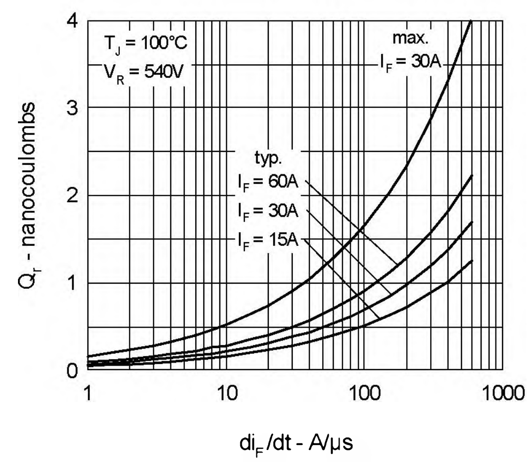


Fig.15 Peak Reverse Recovery Current

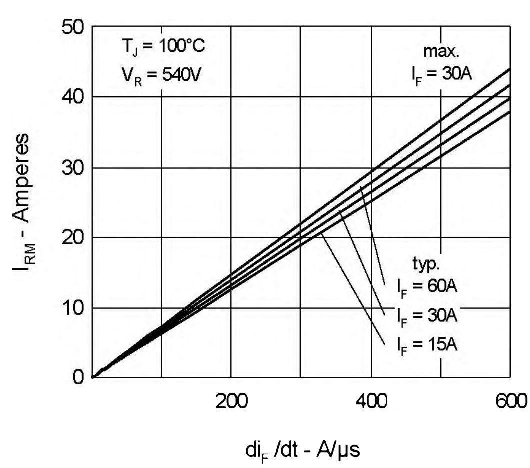


Fig.16 Reverse Recovery Time

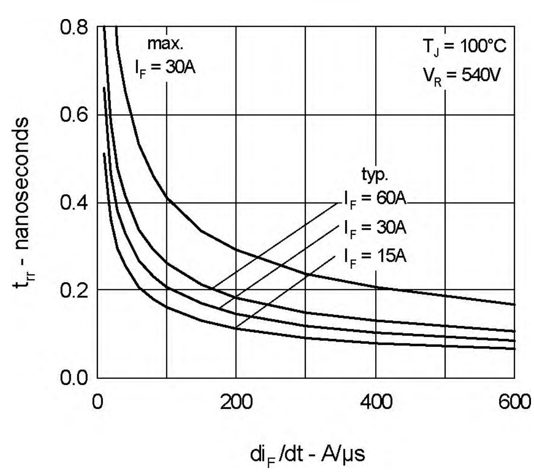


Fig.17 Diode Transient Thermal resistance junction to case