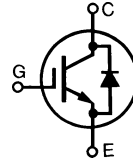


High Speed IGBT with Diode

IXSH 30N60BD1
IXSK 30N60BD1
IXST 30N60BD1

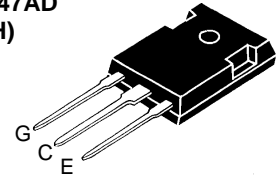
V_{CES} = 600 V
I_{C25} = 55 A
V_{CE(sat)} = 2.0 V
t_{fi} = 140 ns

Short Circuit SOA Capability

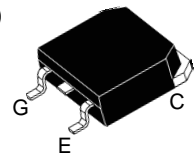


Symbol	Test Conditions	Maximum Ratings	
V _{CES}	T _J = 25°C to 150°C	600	V
V _{CGR}	T _J = 25°C to 150°C; R _{GE} = 1 MΩ	600	V
V _{GES}	Continuous	±20	V
V _{GEM}	Transient	±30	V
I _{C25}	T _C = 25°C	55	A
I _{C90}	T _C = 90°C	30	A
I _{CM}	T _C = 25°C, 1 ms	110	A
SSOA (RBSOA)	V _{GE} = 15 V, T _J = 125°C, R _G = 10 Ω Clamped inductive load, V _{CL} = 0.8 V _{CES}	I _{CM} = 60	A
t_{SC} (SCSOA)	V _{GE} = 15 V, V _{CE} = 360 V, T _J = 125°C R _G = 33 Ω, non repetitive	10	μs
P _C	T _C = 25°C	200	W
T _J		-55 ... +150	°C
T _{JM}		150	°C
T _{stg}		-55 ... +150	°C
M _d	Mounting torque	1.13/10	Nm/lb.in.
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
Weight	TO-247/TO-268	6/4	g
	TO-264	10	g

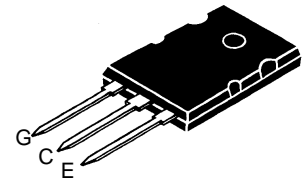
TO-247AD (IXSH)



TO-268 (D3) (IXST)



TO-264 (IXSK)



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

Features

- International standard packages: JEDEC TO-247, TO-264 & TO-268
- Short Circuit SOA capability
- Medium frequency IGBT and anti-parallel FRED in one package
- New generation HDMOS™ process

Applications

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

Advantages

- Space savings (two devices in one package)
- Easy to mount with 1 screw (isolated mounting screw hole)
- Surface mountable, high power case style
- Reduces assembly time and cost
- High power density

Symbol	Test Conditions	Characteristic Values (T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
BV _{CES}	I _C = 750 μA, V _{GE} = 0 V	600		V
V _{GE(th)}	I _C = 2.5 mA, V _{CE} = V _{GE}	4		V
I _{CES}	V _{CE} = 0.8 • V _{CES} V _{GE} = 0 V	T _J = 25°C		200 μA
		T _J = 125°C		3 mA
I _{GES}	V _{CE} = 0 V, V _{GE} = ±20 V			±100 nA
V _{CE(sat)}	V _{GE} = 15 V	I _C = I _{C90}		2.0 V
		I _C = I _{C25}		2.7 V

Fig.1 Saturation Characteristics

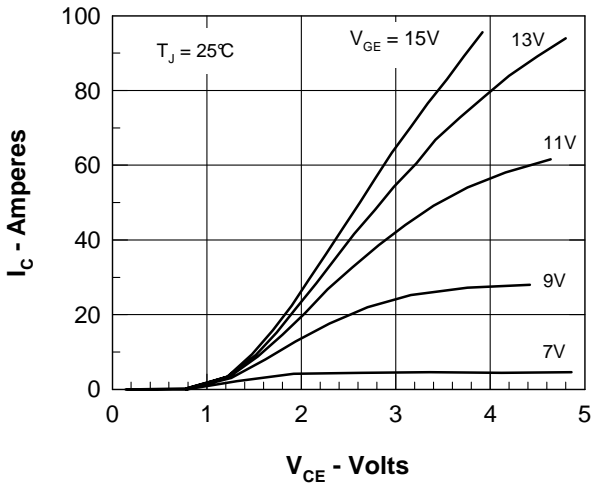


Fig.2 Output Characteristics

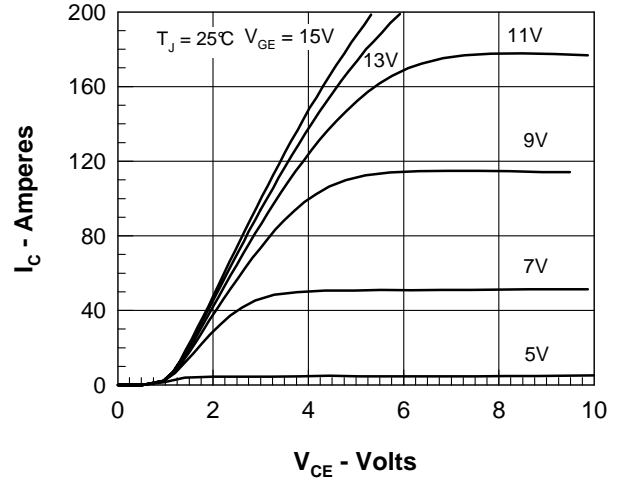


Fig.3 Collector-Emitter Voltage vs. Gate-Emitter Voltage

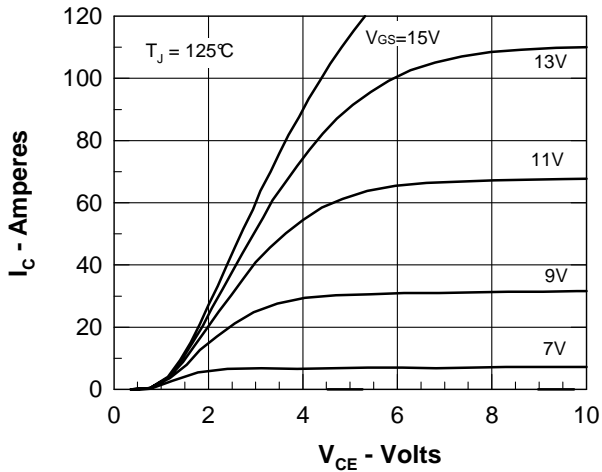


Fig.4 Temperature Dependence of Output Saturation Voltage

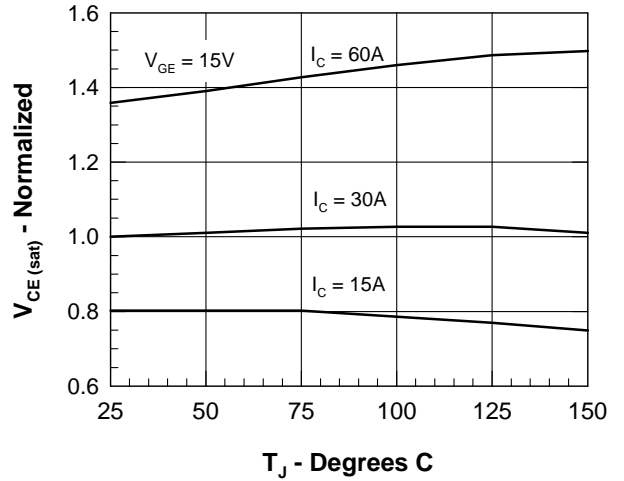


Fig.5 Input Admittance

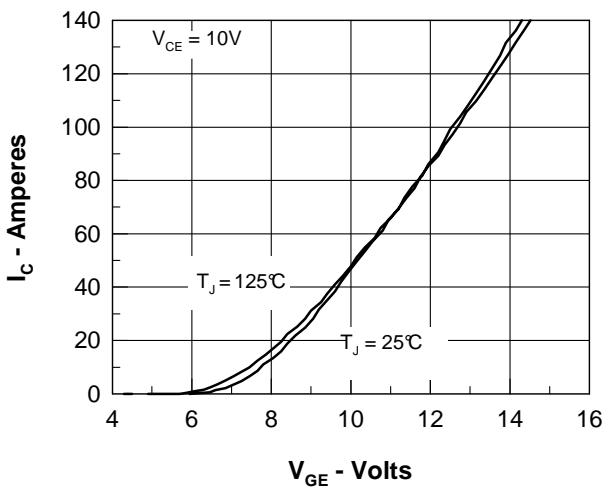


Fig.6 Temperature Dependence of Breakdown and Threshold Voltage

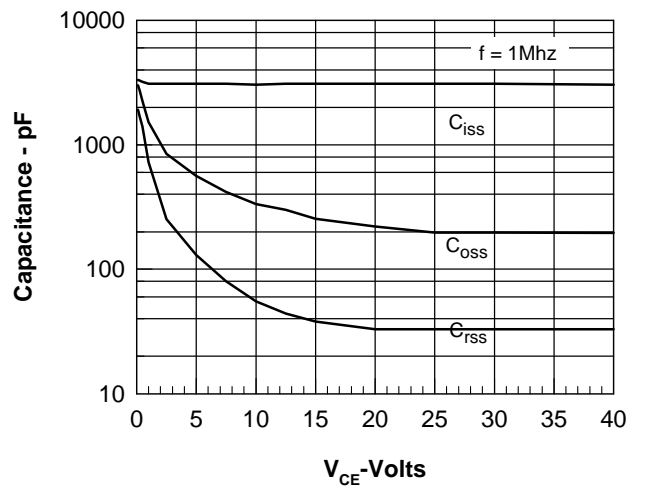


Fig.7 Turn-Off Energy per Pulse and Fall Time on Collector Current

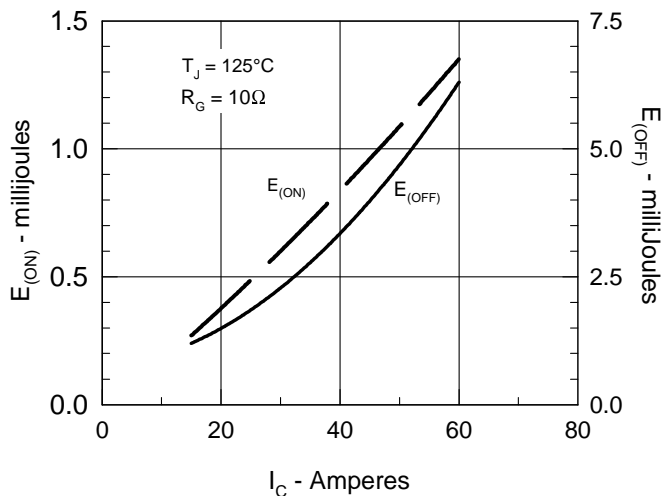
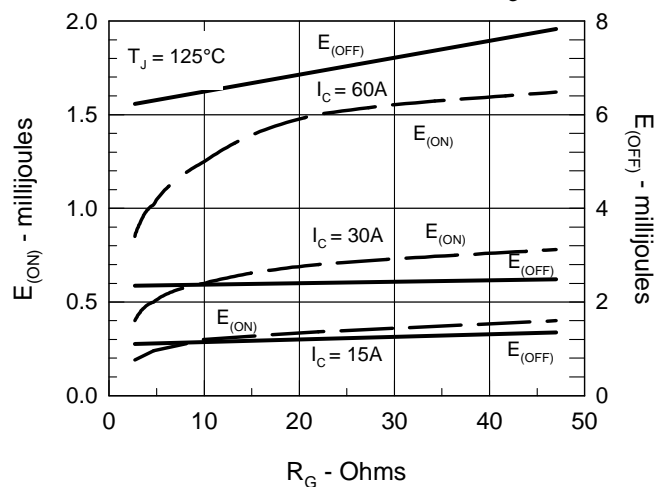

 Fig.8 Dependence of Turn-Off Energy Per Pulse and Fall Time on R_G


Fig.9 Gate Charge Characteristic Curve

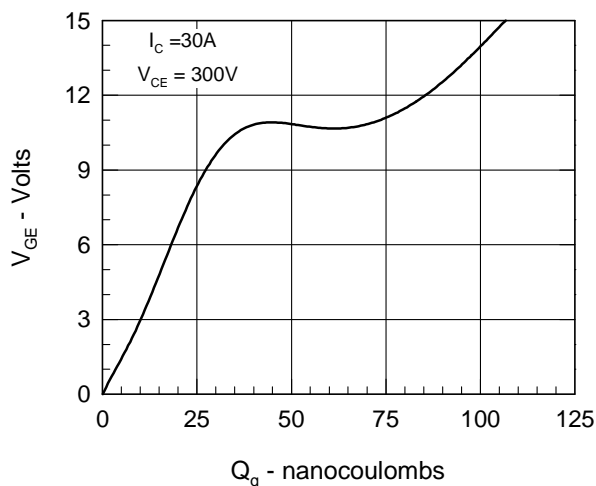


Fig.10 Turn-Off Safe Operating Area

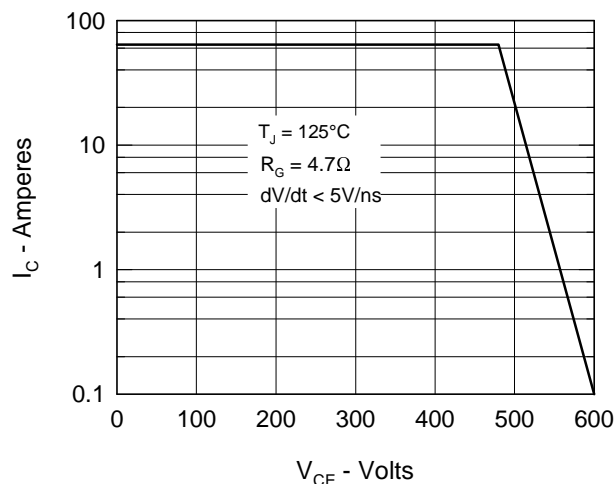
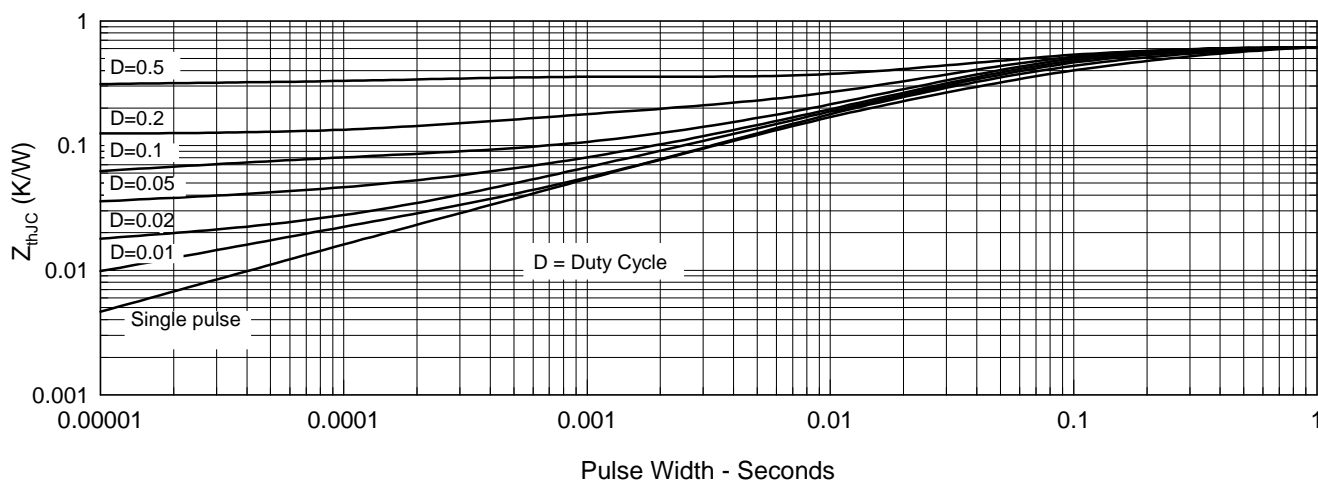


Fig.11 Transient Thermal Resistance



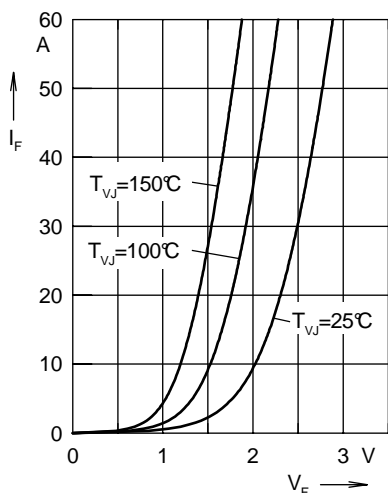
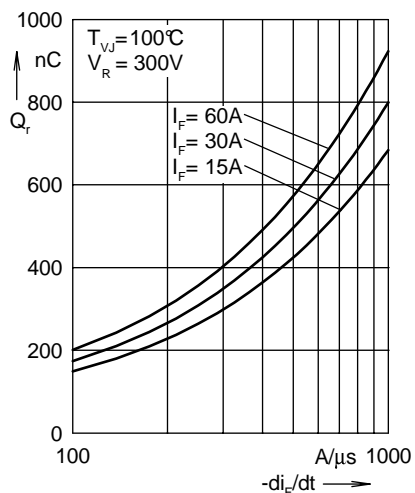
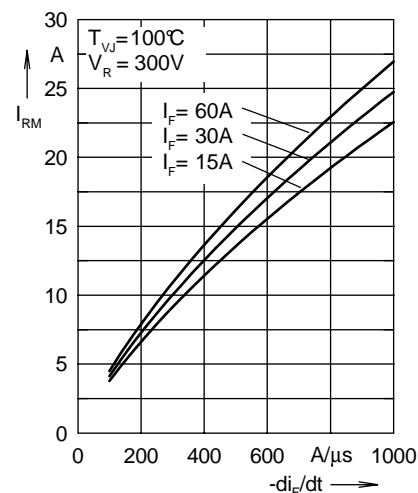
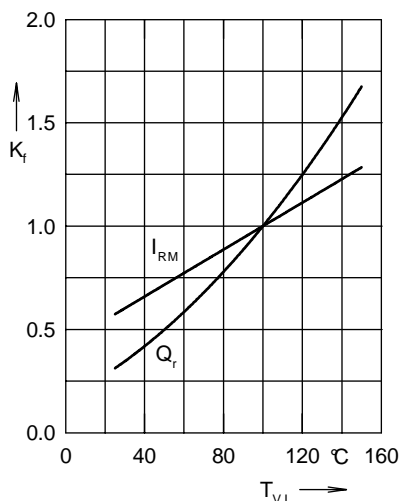
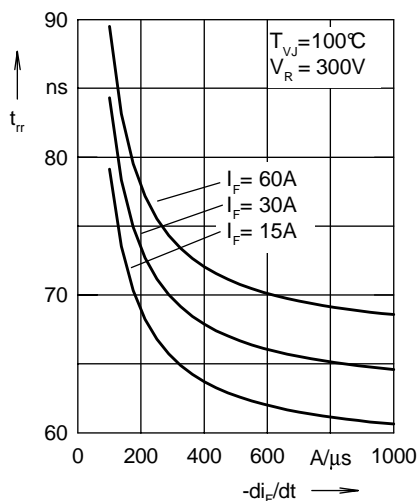
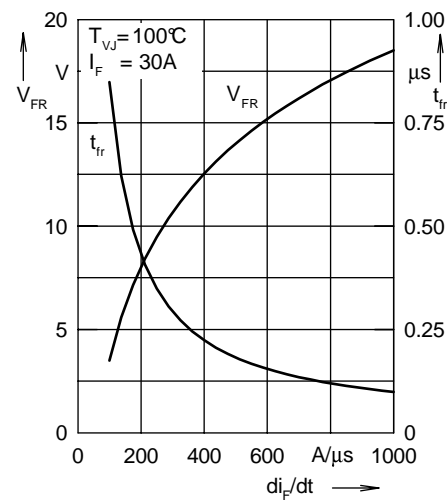
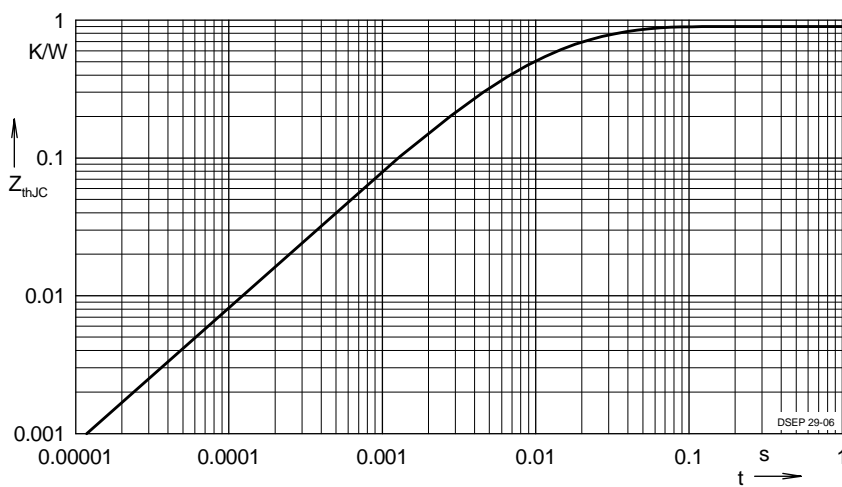

 Fig. 12 Forward current I_F versus V_F

 Fig. 13 Reverse recovery charge Q_r versus $-di_F/dt$

 Fig. 14 Peak reverse current I_{RM} versus $-di_F/dt$

 Fig. 15 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

 Fig. 16 Recovery time t_{rr} versus $-di_F/dt$

 Fig. 17 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt


Fig. 18 Transient thermal resistance junction to case

 Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.502	0.0052
2	0.193	0.0003
3	0.205	0.0162