IXYS

Advance Technical Information

Preliminary Technical Specification

IXYH55N120C4

GenX4™ IGBT

High Speed IGBT for 20-60kHz Switching

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	Unit
g_{fs}	I_C = 55A, V_{CE} = 10V, Note 1	18	30		S
C_{ies}			23		nF
C_{oes}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		1		nF
C_{res}			1		nF
$Q_{g(on)}$	I_C = 55A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		1		nC
Q_{ge}					nC
Q_{gc}					nC
$t_{d(on)}$	Inductive load, T_J = 25°C		50		ns
t_{ri}	I_C = 40A, V_{GE} = 15V		50		ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 5Ω		3.50		mJ
$t_{d(off)}$	Note 2		190		ns
t_{fi}	T_J = 25°C to 175°C		32		ns
E_{off}			1200		μJ
$t_{d(off)}$	T_J = 25°C to 175°C, R_G = 1MΩ		1.5		mJ
t_{fi}			1200		ns
E_{off}			2.5		mJ

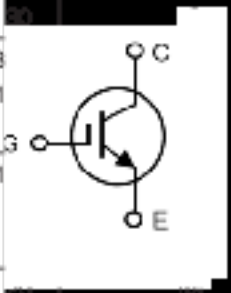
Symbol	Test Conditions	Maximum Ratings		Unit
V_{CES}	T_J = 25°C to 150° C		1200	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ		1200	V
V_{GES}	Continuous		±20	V
V_{GEM}	Transient		±30	V
I_{C25}	I_C = 250μA, V_{GE} = 15V		110	A
I_{C110}	T_C = 110°C		55	A
I_F	T_C = 110°C		55	A
I_{CM}	Note 2		220	A
I_A	T_C = 25°C, 1ms		220	A
E_{AS}	T_C = 25°C		2.5	J
P_C	T_C = 25°C		500	W
T_J		-55 ... +175		°C
T_{JM}			175	°C
T_{stg}		-55 ... +175		°C
T_L	Maximum Lead Temperature for Soldering 1.6 mm (0.062 in.) from Case for 10s		300	°C
T_{SOLD}			260	°C
F_C	Mounting Torque	1.13 / 10		Nm/lb.in
Weight			6	g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	Unit
BV_{CES}	I_C = 250μA, V_{GE} = 0V	1200			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}	4.0		5.5	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			20	μA
	T_J = 150°C			500	μA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 55A, V_{GE} = 15V, Note 1		2.1	2.5	V
	T_J = 150°C		2.6		V

Symbol	Test Conditions	Characteristic Values Min.	Typ.	Max.	Unit
$t_{d(on)}$	Inductive load, T_J = 150°C		50		ns
t_{ri}	I_C = 40A, V_{GE} = 15V		50		ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 5Ω		3.50		mJ
$t_{d(off)}$	Note 2		190		ns
t_{fi}	T_J = 25°C to 175°C		32		ns
E_{off}			1200		μJ
$t_{d(off)}$	T_J = 25°C to 175°C, R_G = 1MΩ		1.5		mJ
t_{fi}			1200		ns
E_{off}			2.5		mJ
$RBSOA$	Reverse Bias Safe Operating Area				
P_{CM}	V_{CE} = 15V, T_{VJ} = 125°C, R_G = 5Ω		110		A
I_{CM}	Clamped Inductive Load	V_{CE} ≤ 0.8 • V_{CES}			
$SCSOA$					
t_{sc}	T_J = 25°C		10		μs
$(SCSOA)$	V_{CE} = 15V, T_{VJ} = 125°C, R_G = 5Ω				
I_{sc}	Short Circuit Clamped Inductive Load	V_{CE} ≤ 0.8 • V_{CES}			

Symbol	Test Conditions	Characteristic Values Min.	Typ.	Max.	Unit
R_{thJC}				0.23	°C/W
R_{thCS}			0.21		°C/W

V_{CES} = 1200V
I_{C110} = 55A
$V_{CE(sat)}$ ≤ 2.5V
$t_{fi(typ)}$ = 42ns



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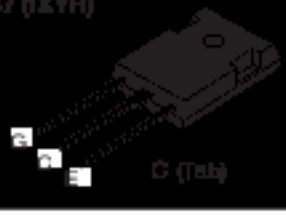

G = Gate C = Collector
E = Emitter Tab = Collector

- Optimized for Low Switching Losses

Notes:
1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%
2. Switching times & energy losses may increase for higher V_{CE} (Clamp), T_J or R_G

Applications

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are based on preliminary engineering evaluations of the design, based upon past knowledge and sample data. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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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 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537

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