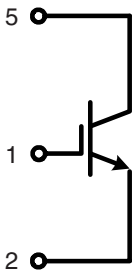
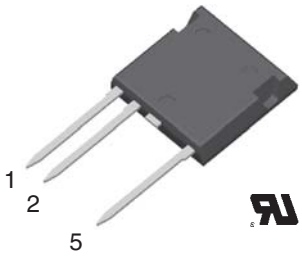
High Voltage IGBT

in High Voltage
ISOPLUS i4-PAC™

I_{C25} = 32 A
V_{CES} = 2500 V
$V_{CE(sat)}$ = 3.2 V
t_f = 250 ns





IGBT

Symbol	Conditions	Maximum Ratings	
V_{CES}	T_{VJ} = 25°C to 150°C	2500	V
V_{GES}		± 20	V
I_{C25}	T_C = 25°C	32	A
I_{C90}	T_C = 90°C	19	A
I_{CM}	V_{GE} = ±15 V; R_G = 47 Ω; T_{VJ} = 125°C	70	A
V_{CEK}	RBSOA, Clamped inductive load; L = 100 µH	1200	V
P_{tot}	T_C = 25°C	250	W

Symbol	Conditions (T_{VJ} = 25°C, unless otherwise specified)	Characteristic Values min.	typ.	max.	
$V_{CE(sat)}$	I_C = 19 A; V_{GE} = 15 V; T_{VJ} = 25°C		3.2	3.9	V
	T_{VJ} = 125°C		4.7		V
$V_{GE(th)}$	I_C = 1 mA; V_{GE} = V_{CE}	5		8	V
I_{CES}	V_{CE} = V_{CES}; V_{GE} = 0 V; T_{VJ} = 25°C			0.15	mA
	T_{VJ} = 125°C		0.2		mA
I_{GES}	V_{CE} = 0 V; V_{GE} = ± 20 V			500	nA
$t_{d(on)}$	Inductive load, T_{VJ} = 125°C		100		ns
t_r	V_{CE} = 1500 V; I_C = 19 A		50		ns
$t_{d(off)}$	V_{GE} = ±15 V; R_G = 47 Ω		600		ns
t_f			250		ns
E_{on}			15		mJ
E_{off}			30		mJ
C_{ies}	V_{CE} = 25 V; V_{GE} = 0 V; f = 1 MHz		2.28		nF
C_{oes}			103		pF
C_{res}			43		pF
Q_{Gon}	V_{CE} = 1500V; V_{GE} = 15 V; I_C = 19 A		142		nC
R_{thJC}				0.5	K/W

Features

- High Voltage IGBT
  - substitute for high voltage MOSFETs with significantly lower voltage drop and comparable switching speed
  - substitute for high voltage thyristors with voltage control of turn on & turn off
  - substitute for electromechanical trigger and discharge relays
- ISOPLUS i4-PAC™ high voltage package
  - isolated back surface
  - enlarged creepage towards heatsink
  - enlarged creepage between high voltage pins
  - application friendly pinout
  - high reliability
  - industry standard outline
  - UL registered E72873

Applications

- switched mode power supplies
- DC-DC converters
- resonant converters
- laser generators, x ray generators
- discharge circuits

IXYS reserves the right to change limits, test conditions and dimensions.

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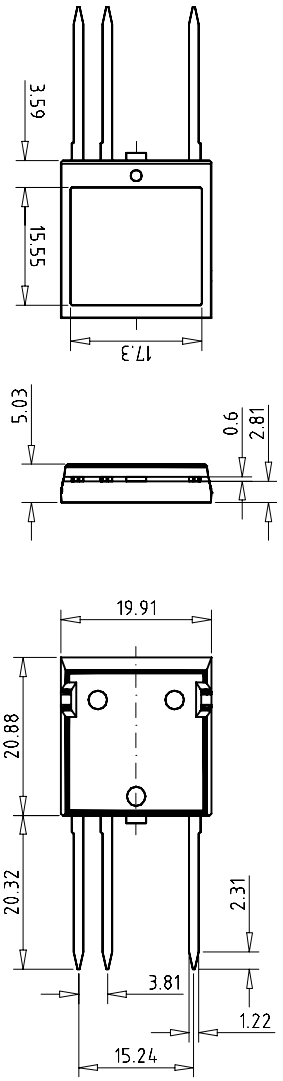
Component

Symbol	Conditions	Maximum Ratings	
T_{VJ}		-55...+150	°C
T_{stg}		-55...+125	°C
V_{ISOL}	$I_{ISOL} \leq 1$ mA; 50/60 Hz	2500	V~
F_C	mounting force with clip	20...120	N

Symbol	Conditions	Characteristic Values min.	typ.	max.	
d_S,d_A	C pin - E pin	7.0			mm
d_S,d_A	pin - backside metal	5.5			mm
R_{thCH}	with heatsink compound		0.15		K/W
Weight			9		g

Dimensions in mm (1 mm = 0.0394")



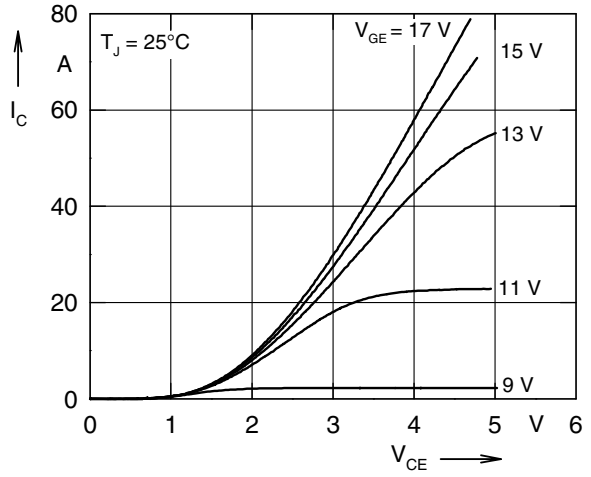


Fig. 1 Typ. Output Characteristics

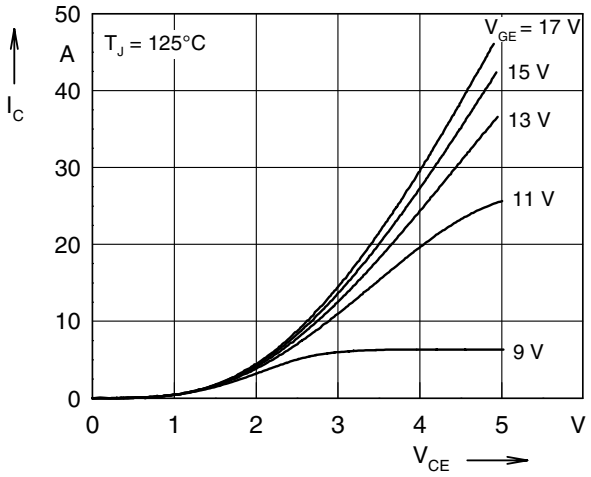


Fig. 2 Typ. Output Characteristics

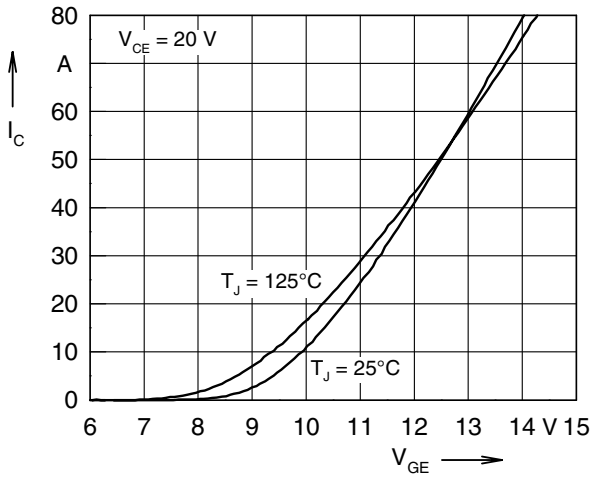


Fig. 3 Typ. Transfer Characteristics

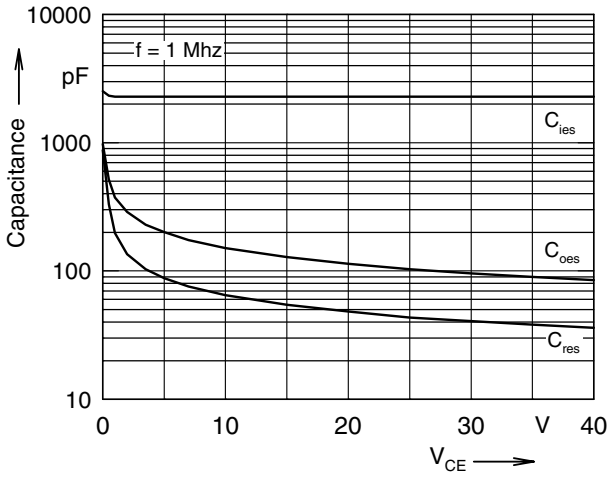


Fig. 4 Capacitance curves

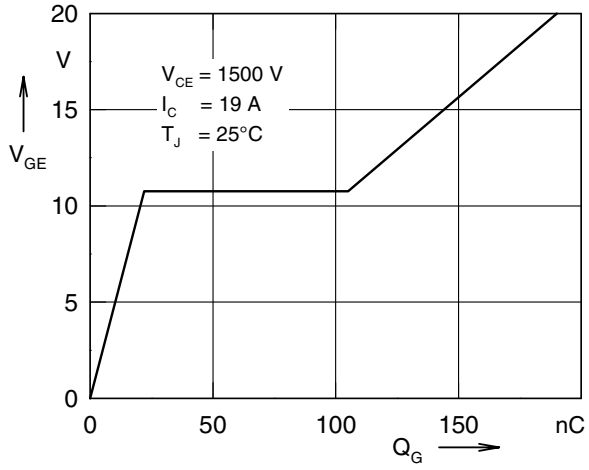


Fig. 5 Typ. Gate Charge characteristics

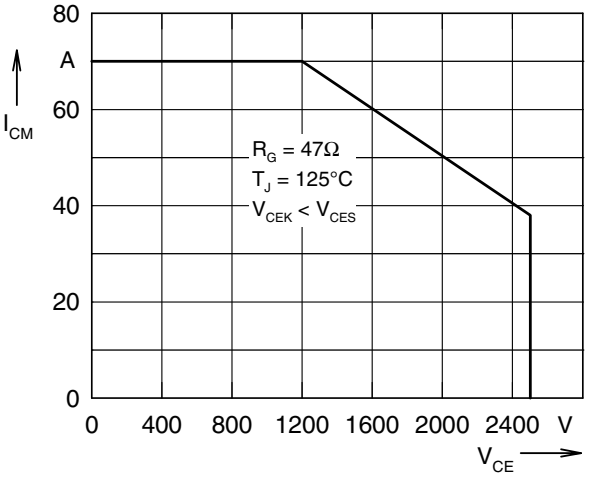


Fig. 6 Reverse Biased Safe Operating Area RBSOA

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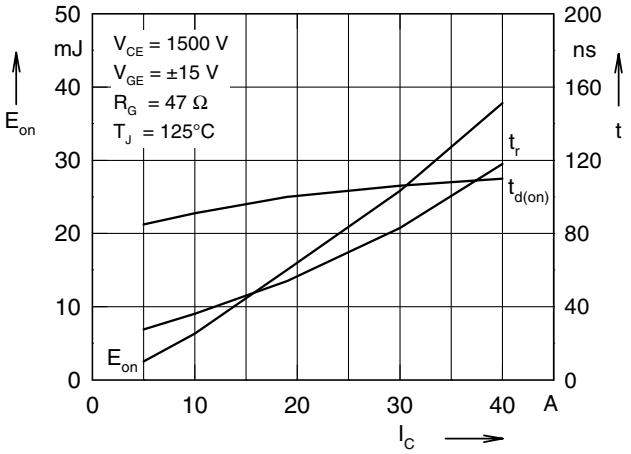

Fig. 7 Typ. turn on energy and switching times versus collector current

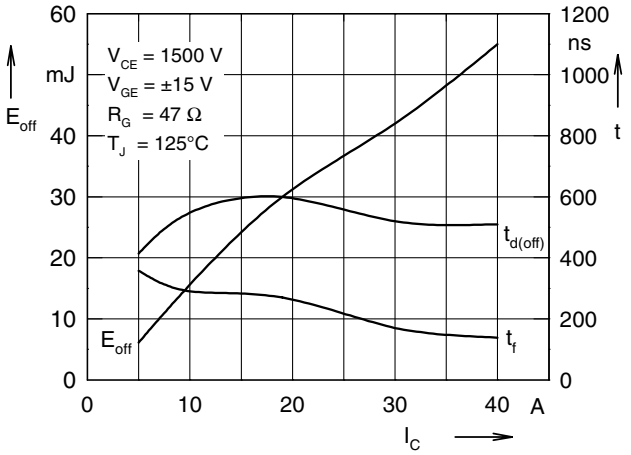

Fig. 8 Typ. turn off energy and switching times versus collector current

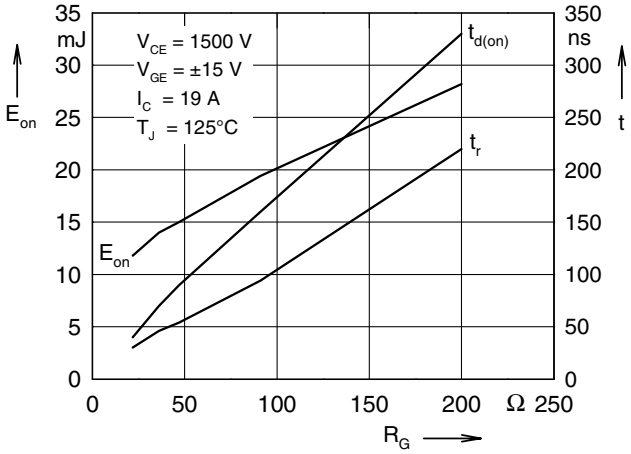

Fig. 9 Typ. turn on energy and switching times versus gate resistor

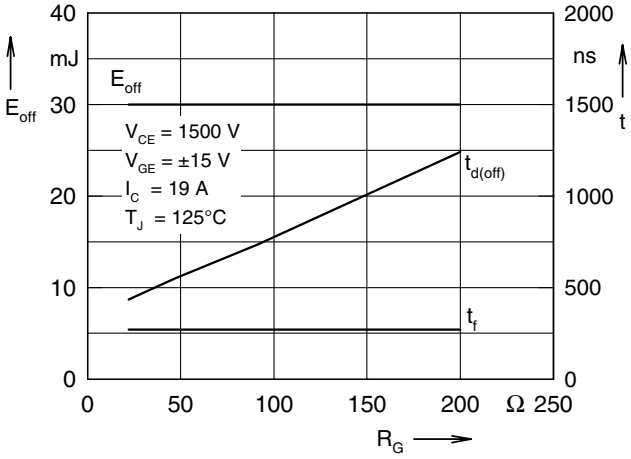

Fig. 10 Typ. turn off energy and switching times versus gate resistor

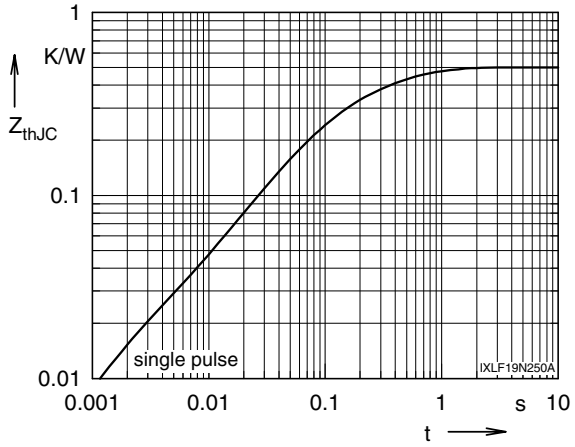

Fig. 11 Typ. transient thermal impedance