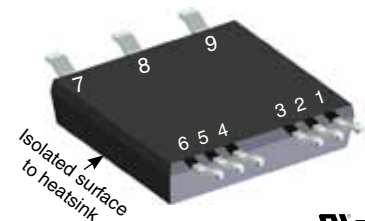
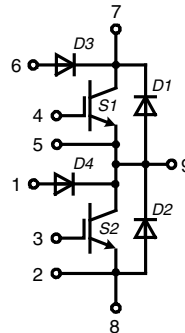


XPT IGBT phaseleg ISOPLUS™ Surface Mount Power Device

$$\begin{aligned} I_{C25} &= 32 \text{ A} \\ V_{CES} &= 1200 \text{ V} \\ V_{CE(sat) \text{ typ}} &= 1.8 \text{ V} \end{aligned}$$



E72873

IGBTs S1, S2

Symbol	Conditions	Maximum Ratings	
V_{CES}	$T_{VJ} = 25^{\circ}\text{C}$ to 150°C	1200	V
V_{GES}		± 20	V
I_{C25}	$T_C = 25^{\circ}\text{C}$	32	A
I_{C80}	$T_C = 80^{\circ}\text{C}$	23	A
I_{CM}	$V_{GE} = 15 \text{ V}; R_G = 56 \Omega; T_{VJ} = 125^{\circ}\text{C}$ RBSOA, clamped inductive load; $L = 100 \mu\text{H}$	45	A
V_{CEK}		V_{CES}	
t_{SC} (SCSOA)	$V_{CE} = 900 \text{ V}; V_{GE} = \pm 15 \text{ V}; R_G = 56 \Omega; T_{VJ} = 125^{\circ}\text{C}$ none repetitive	10	μs
P_{tot}	$T_C = 25^{\circ}\text{C}$	130	W

Symbol Conditions Characteristic Values

(T_{VJ} = 25°C, unless otherwise specified)

		min.	typ.	max.	
$V_{CE(sat)}$	$I_C = 15 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		1.8 2.1	2.1	V V
$V_{GE(th)}$	$I_C = 0.6 \text{ mA}; V_{GE} = V_{CE}$	5.4		6.5	V
I_{CES}	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		250	125	μA μA
I_{GES}	$V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$			500	nA
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off} $E_{(rec)off}$	Inductive load; $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600 \text{ V}; I_C = 15 \text{ A}$ $V_{GE} = \pm 15 \text{ V}; R_G = 56 \Omega$		70 40 250 100 1.55 1.7		ns ns ns ns mJ mJ
C_{ies}			tbd		pF
Q_{Gon}			48		nC
R_{thJC}				1.0	K/W
R_{thJH}			1.35	1.7	K/W

Features

- **XPT IGBT**
 - low saturation voltage
 - positive temperature coefficient for easy paralleling
 - fast switching
 - short tail current for optimized performance in resonant circuits
- **Sonic™ diode**
 - fast reverse recovery
 - low operating forward voltage
 - low leakage current
- **V_{CEsat} detection diode**
 - integrated into package
 - very fast diode
- **Package**
 - isolated back surface
 - low coupling capacity between pins and heatsink
 - PCB space saving
 - enlarged creepage towards heatsink
 - application friendly pinout
 - low inductive current path
 - high reliability

Applications

- **Phaseleg**
 - buck-boost chopper
- **Full bridge**
 - power supplies
 - induction heating
 - four quadrant DC drives
 - controlled rectifier
- **Three phase bridge**
 - AC drives
 - controlled rectifier

Diodes D1, D2

Symbol	Conditions	Maximum Ratings			
I _{F25}	T _C = 25°C			27	A
I _{F80}	T _C = 80°C			18	A
Symbol	Conditions	Characteristic Values			
(T _{VJ} = 25°C, unless otherwise specified)					
		min.	typ.	max.	
V _F	I _F = 20 A		2.0	2.3	V
			2.0		V
I _{RM}	I _F = 20 A; R _G = 56 Ω; T _{VJ} = 125°C V _R = 600 V; V _{GE} = -15 V		20		A
t _{rr}			350		ns
E _{rec}			tbd		mJ
R _{thJC}	per diode			1.35	K/W
R _{thJH}	with heatsink compound (IXYS test setup)		1.75	2.2	K/W

Diodes D3, D4

Symbol	Conditions		Maximum Ratings			
V _R	T _C = 25°C to 150°C				1200	V
Symbol	Conditions		Characteristic Values			
			(T _{VJ} = 25°C, unless otherwise specified)			
			min.	typ.	max.	
V _F	I _F = 1 A	T _{VJ} = 25°C		1.7	2.2	V
		T _{VJ} = 125°C		1.5		V
I _R	V _R = 1200 V	T _{VJ} = 25°C			2	μA
		T _{VJ} = 125°C		30		μA
I _{RM}	I _F = 1 A; di _F /dt = -100 A/μs; T _{VJ} = 25°C			2.3		A
t _{rr}		V _R = 100 V; V _{GE} = 0 V		40		ns

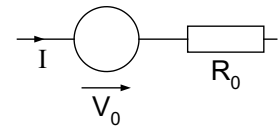
Component

Symbol	Conditions	Maximum Ratings			
T_{VJ}				-55...+150	°C
T_{stg}				-55...+125	°C
V_{ISOL}	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$			2500	V~
F_C	mounting force			40 ... 130	N
Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
C_P	coupling capacity between shorted pins and backside metal		90		pF
d_S, d_A	pin - pin	1.65			mm
d_S, d_A	pin - backside metal	4			mm
CTI		400			
Weight			8		g

Ordering	Ordering Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	IXA20PG1200DHGLB	IXA20PG1200DHGLB	Tape&Reel	200	tbd

Equivalent Circuits for Simulation

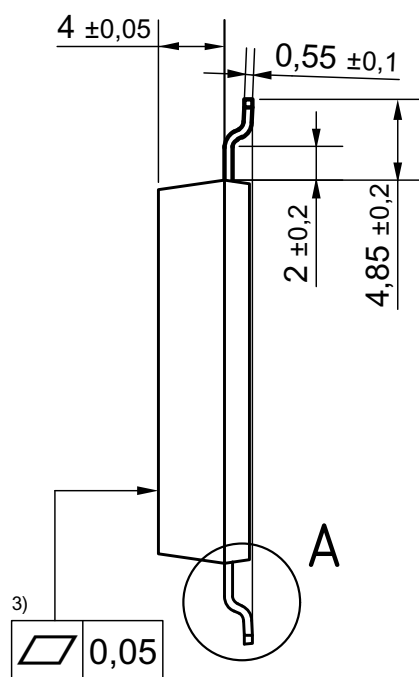
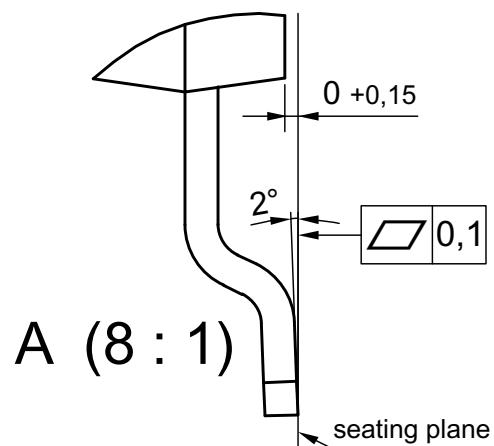
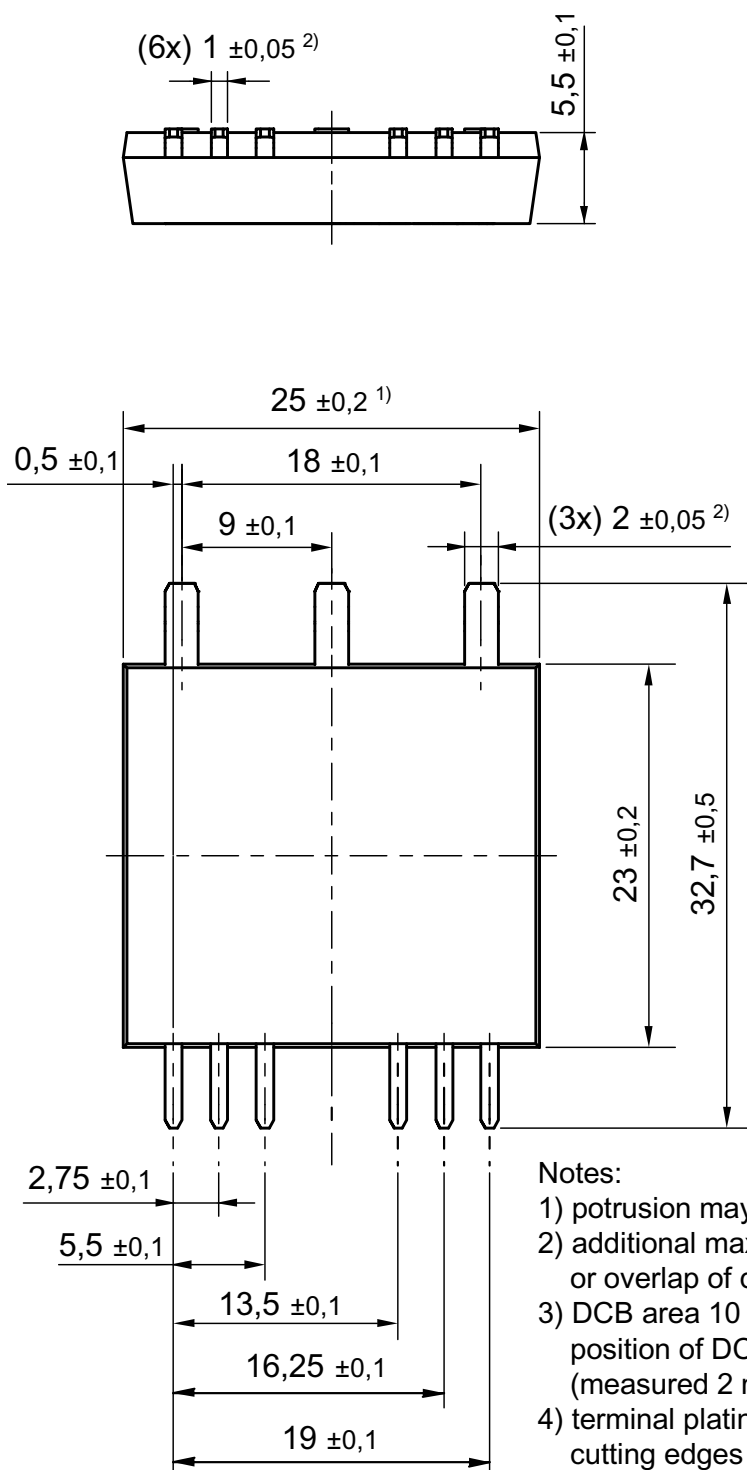
Conduction



IGBTs (typ. at $V_{GE} = 15\text{ V}; T_J = 125^\circ\text{C}$)
S1, S2 $V_0 = 1.1\text{ V}; R_0 = 90\text{ m}\Omega$

Diodes (typ. at $T_J = 125^\circ\text{C}$)
D1, D2 $V_0 = 1.3\text{ V}; R_0 = 41\text{ m}\Omega$

Dimensions in mm (1 mm = 0.0394")


Notes:

- 1) protrusion may add 0.2 mm max. on each side
- 2) additional max. 0.05 mm per side by punching misalignment or overlap of dam bar or bending compression
- 3) DCB area 10 to 50 μm convex; position of DCB area in relation to plastic rim: $\pm 25 \mu\text{m}$ (measured 2 mm from Cu rim)
- 4) terminal plating: 0.2 - 1 μm Ni + 10 - 25 μm Sn (gal v.) cutting edges may be partially free of plating

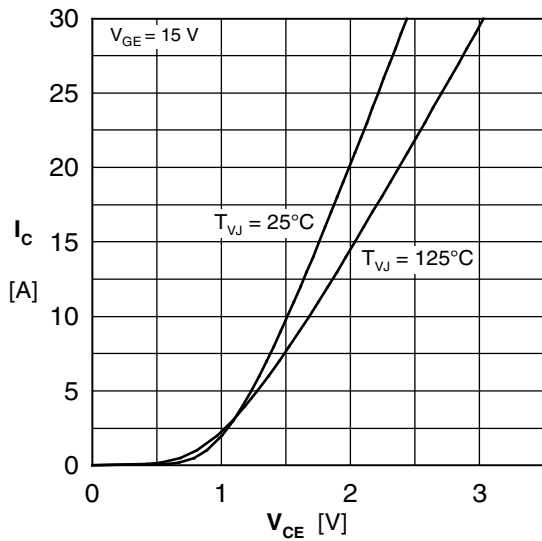


Fig. 1 Typ. output characteristics

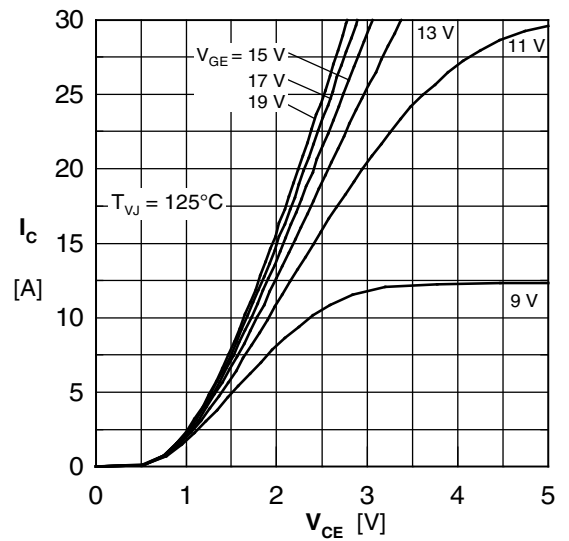


Fig. 2 Typ. output characteristics

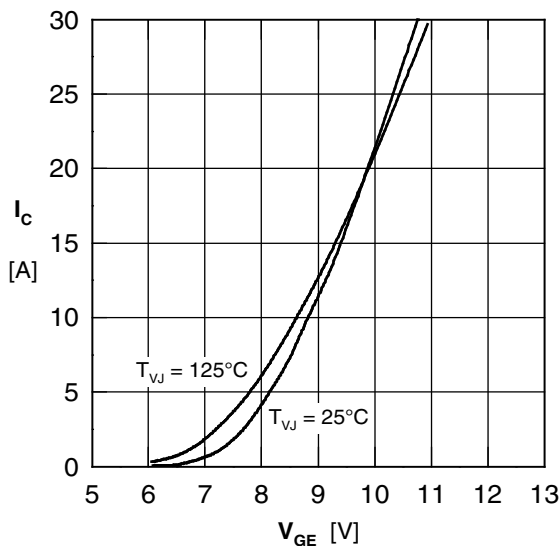


Fig. 3 Typ. transfer characteristics

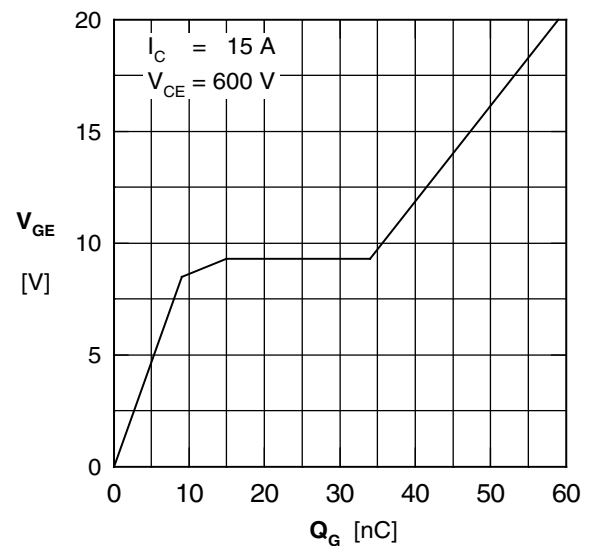


Fig. 4 Typ. turn-on gate charge

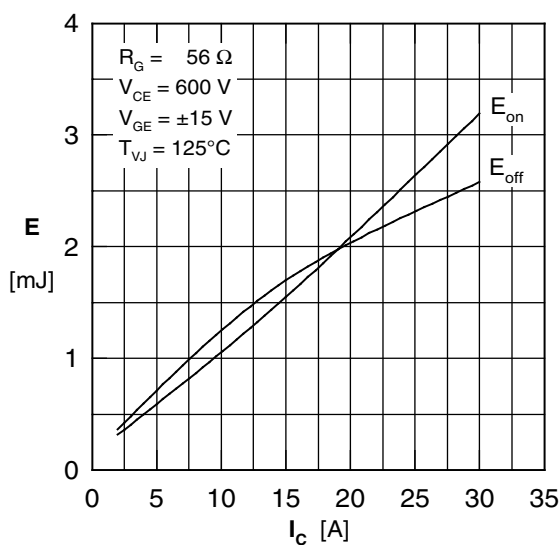


Fig. 5 Typ. switching energy vs. collector current

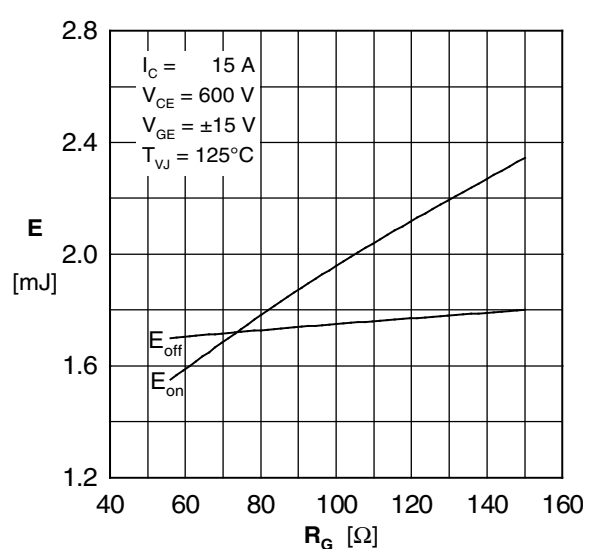


Fig. 6 Typ. switching energy vs. gate resistance

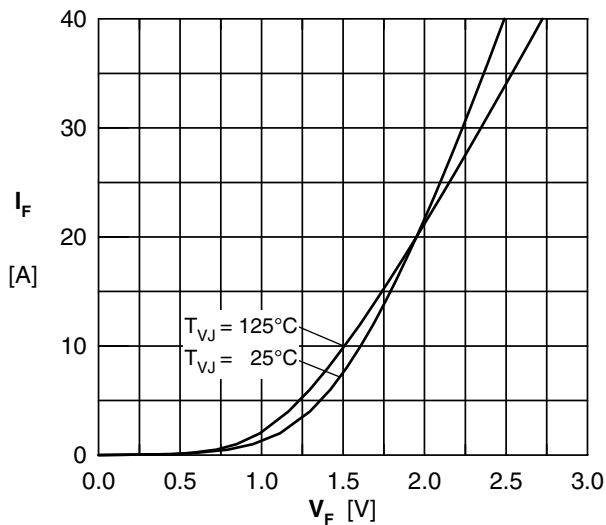


Fig. 7 Typ. Forward current versus V_F

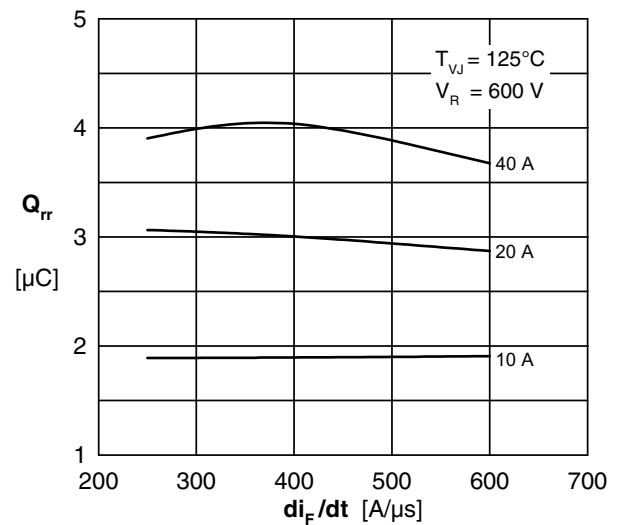


Fig. 8 Typ. reverse recov.charge Q_{rr} vs. di/dt

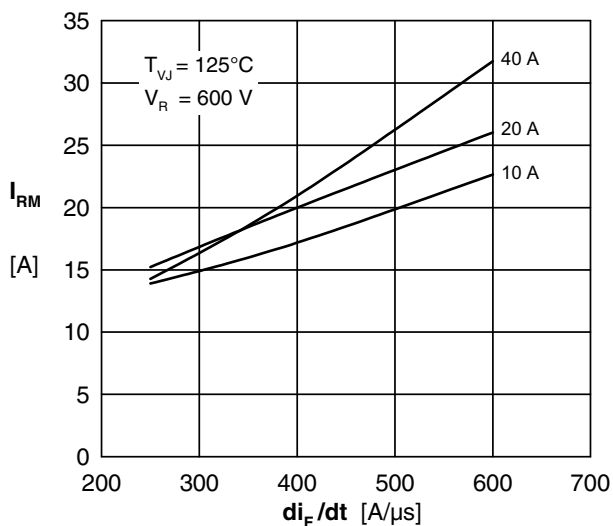


Fig. 9 Typ. peak reverse current I_{RM} vs. di/dt

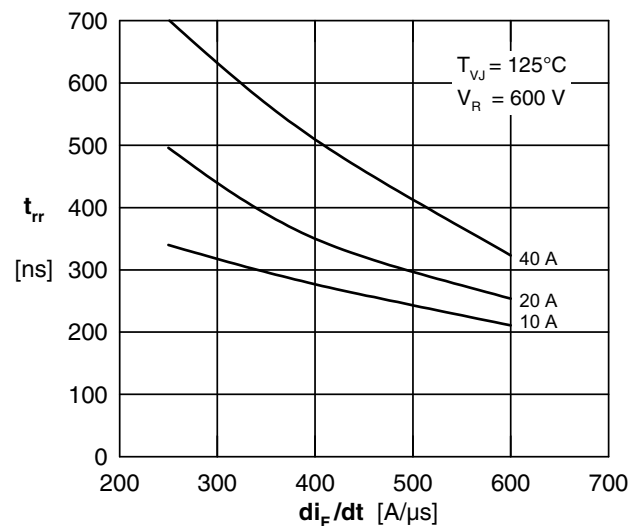


Fig. 10 Typ. recovery time t_{rr} versus di/dt

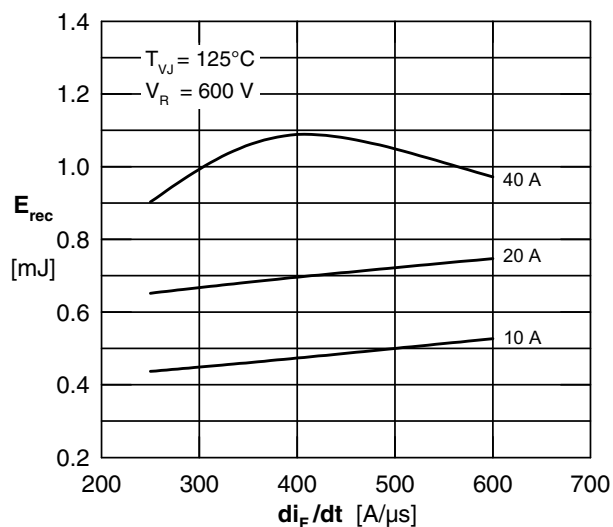


Fig. 11 Typ. recovery energy E_{rec} versus di/dt

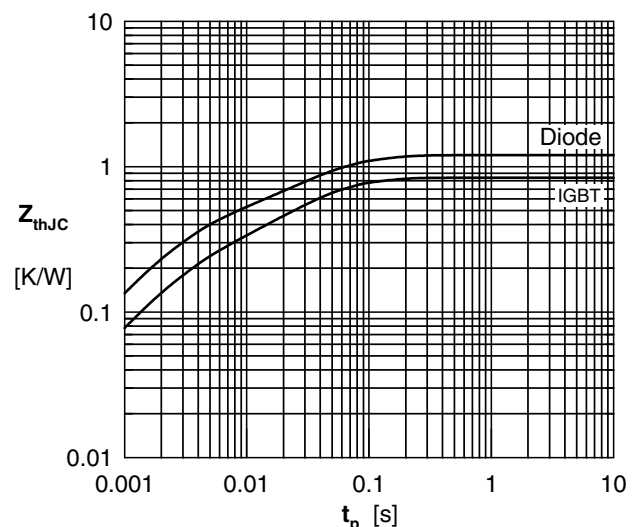


Fig. 12 Typ. transient thermal impedance

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