

**Features :**

- n 10 $\mu$ s short circuit capability
- n 1200V NPT technology
- n Low switching losses
- n  $V_{CE(sat)}$  with positive temperature coefficient
- n Fast & soft reverse recovery anti-parallel FWD

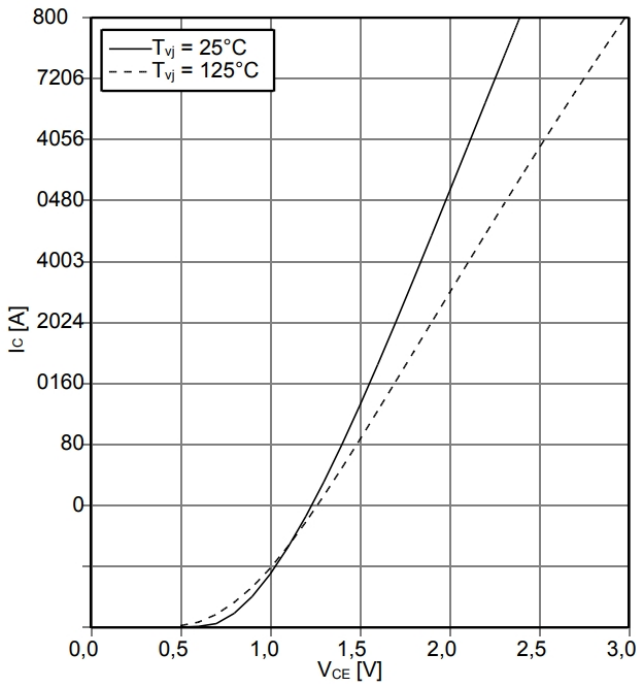
**Typical Applications :**

- n SMPS
- n Inductive heating
- n Electronic welder

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT
			Min	Type	Max	
$V_{CES}$	Collector-Emitter voltage	$T_j=25^\circ\text{C}$			1200	V
$V_{GES}$	Gate-Emitter voltage	$T_j=25^\circ\text{C}$			$\pm 20$	V
$I_c$	Collector current	$T_c=100^\circ\text{C}$			450	A
$I_{CM}$	Repetitive peak collector current	$t_p=1\text{ms}$			800	A
$T_j$	Junction temperature	/			150	$^\circ\text{C}$
$T_{stg}$	Storage temperature	/	-40		150	$^\circ\text{C}$
$V_{iso}$	Isolation between terminal and copper base	$T_j=25^\circ\text{C}$ , AC: 1minute	3000			V
$I_{CES}$	Zero gate voltage collector current	$T_j=25^\circ\text{C}$ , $V_{CE}=1200\text{V}$ , $V_{GE}=0\text{V}$			5	mA
$I_{GES}$	Gate-Emitter leakage current	$T_j=25^\circ\text{C}$ , $V_{CE}=0\text{V}$ , $V_{GE}=\pm 20\text{V}$	-0.4		0.4	$\mu\text{A}$
$BV_{CES}$		$V_{GE}=0\text{V}$ , $I_c=4\text{mA}$	1250			V
$V_{GE(th)}$	Gate-Emitter threshold voltage	$T_j=25^\circ\text{C}$ , $V_{CE}=20\text{V}$ , $I_c=4\text{mA}$	5.0	5.6	7.0	V
$V_{CE(sat)}$	Collector-Emitter saturation voltage	$T_j=25^\circ\text{C}$ , $V_{GE}=15\text{V}$ , $I_c=450\text{A}$		2.1	2.5	V
$R_{Gint}$	Integrated gate resistor			3		$\Omega$
$Q_g$	Gate Charge	$T_j=25^\circ\text{C}$ , $V_{CE}=600\text{V}$ , $I_c=450\text{A}$ , $V_{GE}=\pm 15\text{V}$		2.8		$\mu\text{C}$
$C_{ies}$	Input capacitance			36		nF
$C_{Oes}$	Output capacitance	$T_j=25^\circ\text{C}$ , $V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$		0.7		
$C_{res}$	Reverse transfer capacitance			0.8		nF
$t_{(d)on}$	Turn-on time	$V_{CC}=600\text{V}$ , $I_c=450\text{A}$ , $V_{GE}=\pm 15\text{V}$ , $R_g=3\Omega$ , Inductive load	$T_j=25^\circ\text{C}$	38		ns
$t_r$			$T_j=125^\circ\text{C}$	42		ns
	$T_j=25^\circ\text{C}$		45		ns	
$t_{(d)off}$	Turn-off time		$T_j=125^\circ\text{C}$	53		ns
			$T_j=25^\circ\text{C}$	240		ns
			$T_j=125^\circ\text{C}$	470		ns
			$T_j=25^\circ\text{C}$	170		ns
$t_f$			$T_j=125^\circ\text{C}$	260		ns
$t_{sc}$	Short circuit withstand time	$V_{GE}=15\text{V}$ , $V_{CC}=600\text{V}$		10		$\mu\text{s}$
$V_F$	Forward on voltage	$T_j=25^\circ\text{C}$ , $I_F=450\text{A}$		2.0	2.3	V
		$T_j=125^\circ\text{C}$ , $I_F=450\text{A}$		2.0		V
$I_{RRM}$	Max reverse recovery current	$T_j=125^\circ\text{C}$ , $I_F=450\text{A}$ , $V_R=600\text{V}$		450		A
$I_{FRM}$	Repetitive peak forward current			700		
$t_{rr}$	Diode reverse recovery time	$I_F=450\text{A}$ , $V_R=600\text{V}$ $di_F/dt=-1600\text{A}/\mu\text{s}$ $T_j=125^\circ\text{C}$		350		ns
$R_{th(j-c)}$	Thermal resistance(per chip)	IGBT		0.06	0.09	$^\circ\text{C}/\text{W}$
		FWD		0.4		$^\circ\text{C}/\text{W}$
$W_t$	Weight				340	g
Outline		454H3P				

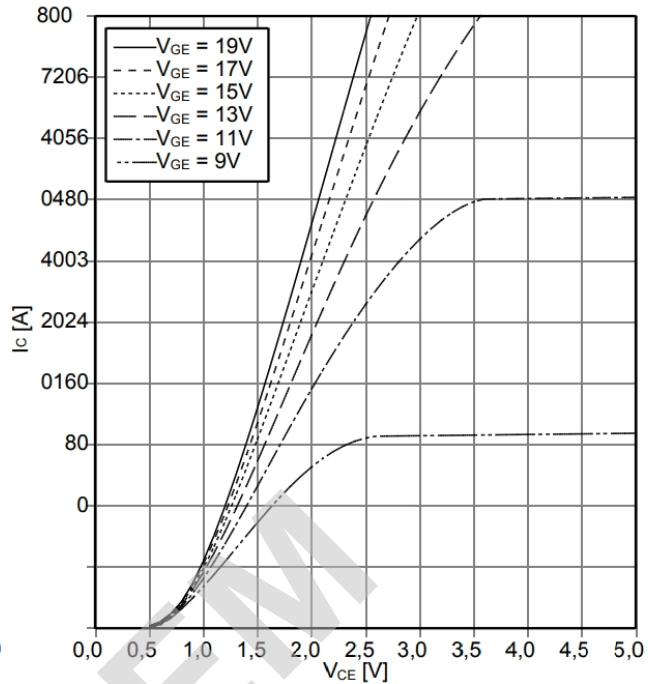
output characteristic IGBT, Inverter (typical)

$I_c = f(V_{CE})$   
 $V_{GE} = 15\text{ V}$



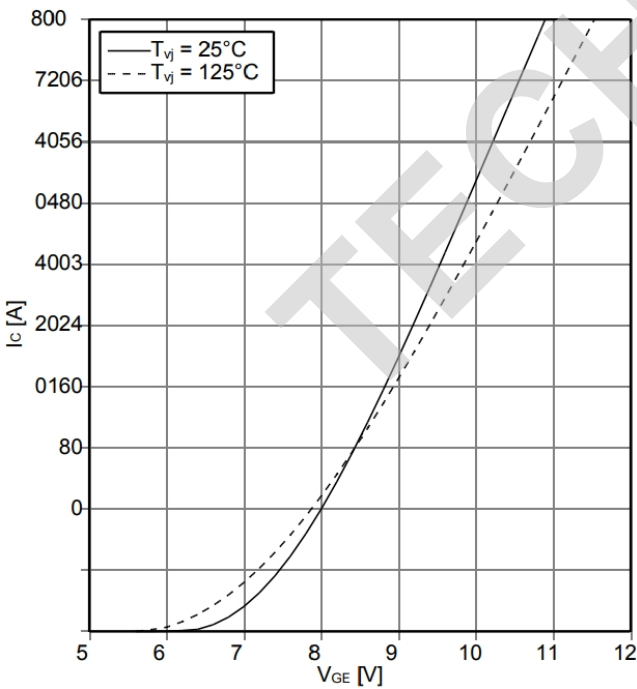
output characteristic IGBT, Inverter (typical)

$I_c = f(V_{CE})$   
 $T_{vj} = 125^\circ\text{C}$



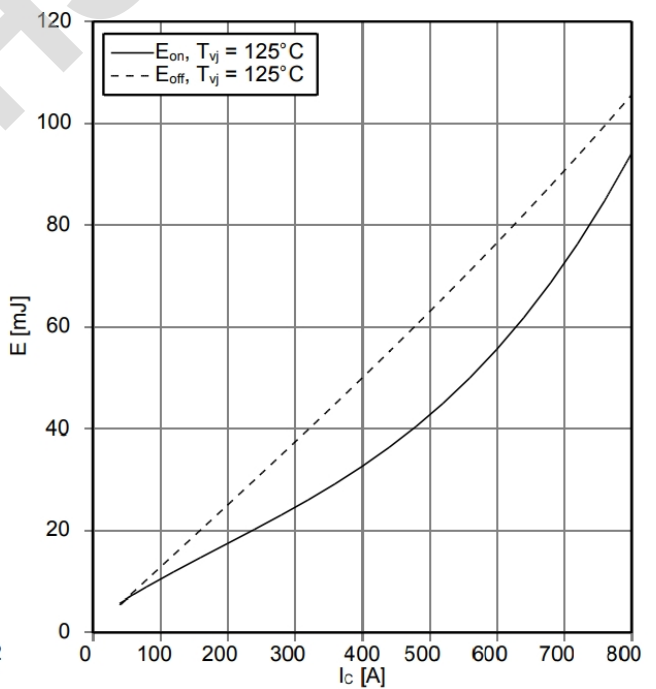
transfer characteristic IGBT, Inverter (typical)

$I_c = f(V_{GE})$   
 $V_{CE} = 20\text{ V}$



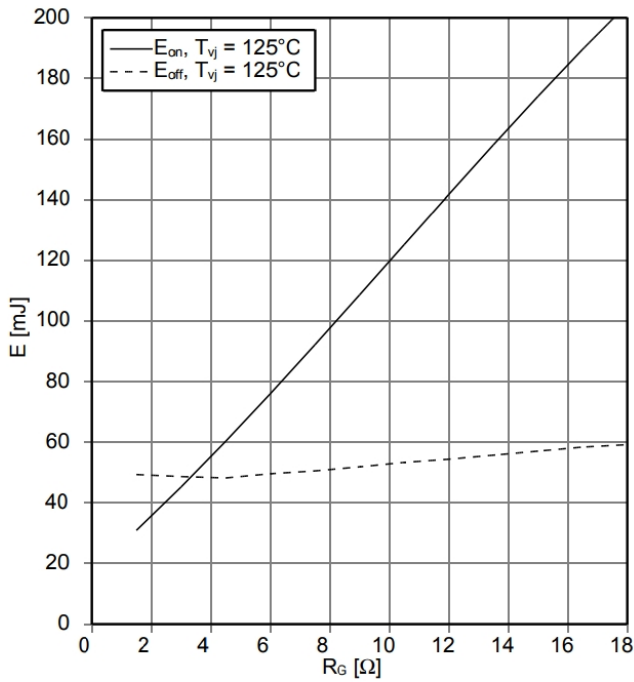
$E_{on} = f(I_c), E_{off} = f(I_c)$

$V_{GE} = \pm 15\text{ V}, R_{Gon} = 1.8\ \Omega, R_{Goff} = 1.8\ \Omega, V_{CE} = 600\text{ V}$



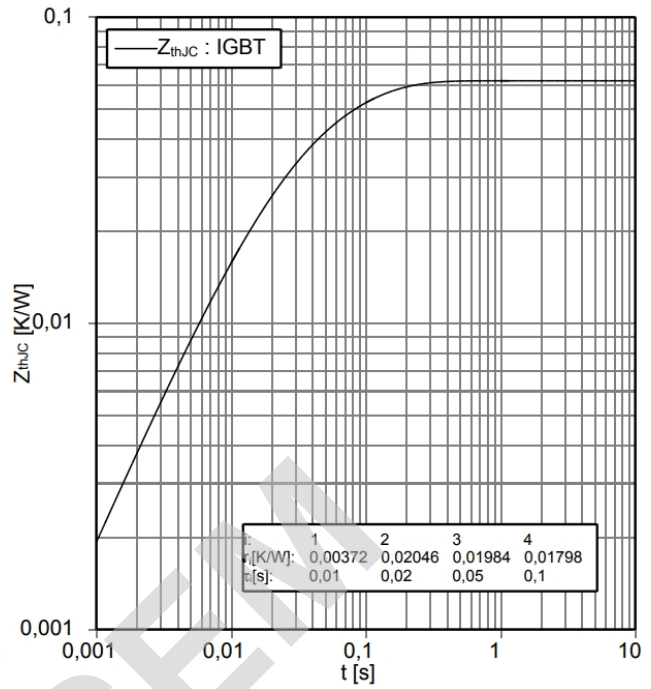
**switching losses IGBT, Inverter (typical)**

$E_{on} = f(R_G), E_{off} = f(R_G)$   
 $V_{GE} = \pm 15\text{ V}, I_C = 400\text{ A}, V_{CE} = 600\text{ V}$



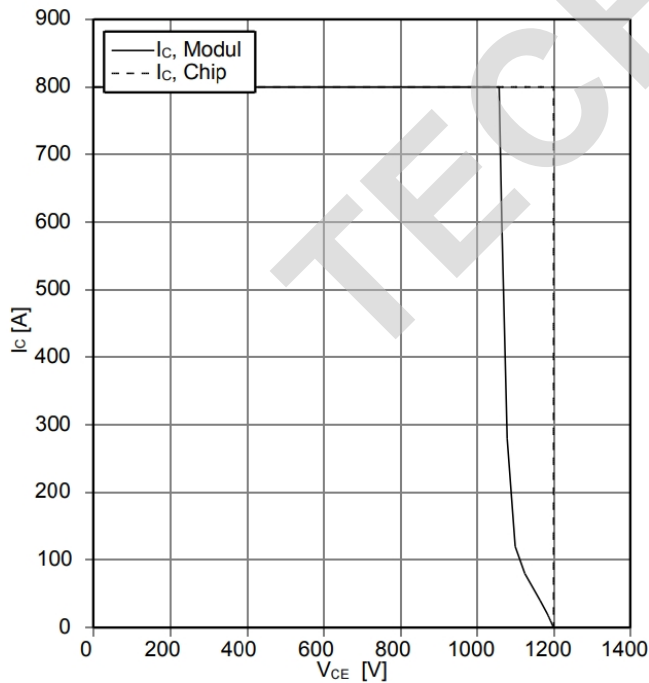
**transient thermal impedance IGBT, Inverter**

$Z_{thJC} = f(t)$



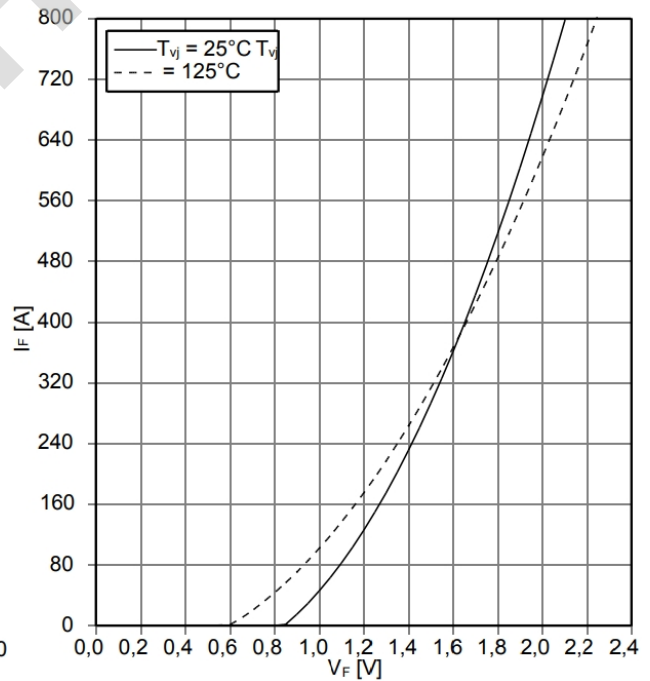
**reverse bias safe operating area IGBT, Inverter (RBSOA)**

$I_C = f(V_{CE})$   
 $V_{GE} = \pm 15\text{ V}, R_{Goff} = 1.8\ \Omega, T_{vj} = 125^\circ\text{C}$



**forward characteristic of Diode, Inverter (typical)**

$I_F = f(V_F)$

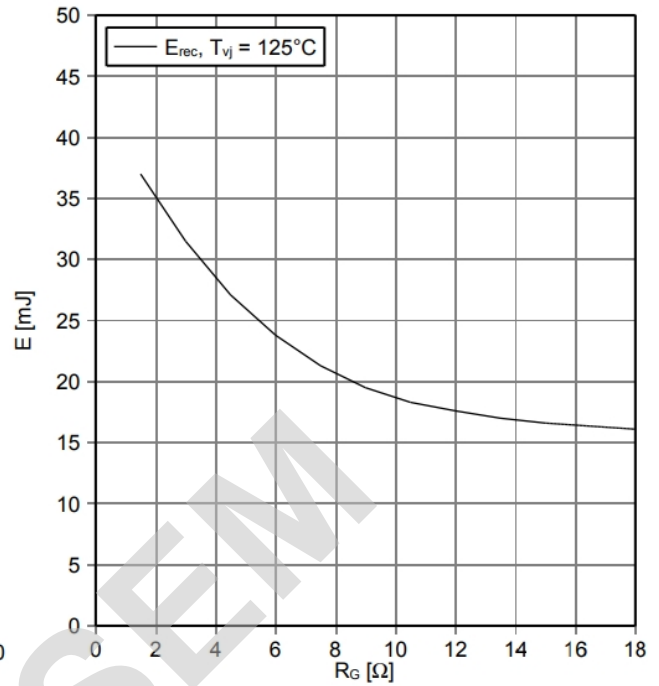
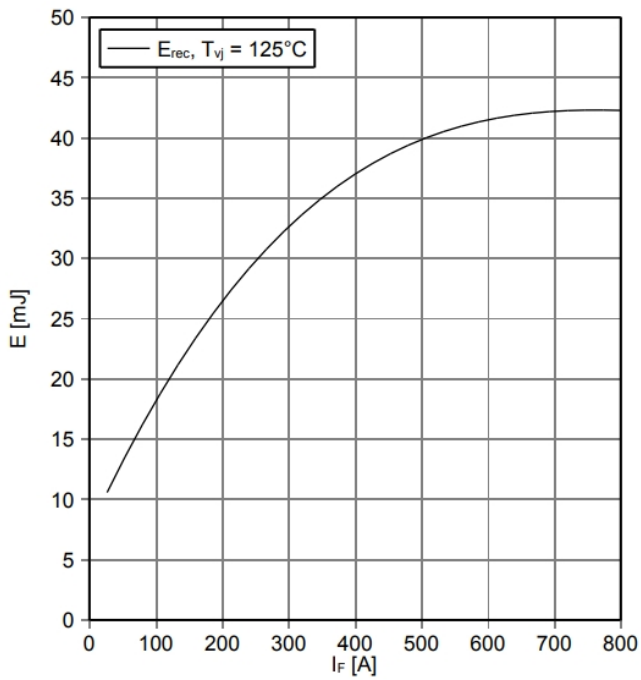


switching losses Diode, Inverter (typical)

$E_{rec} = f(I_F)$   
 $R_{Gon} = 1.8 \Omega, V_{CE} = 600 V$

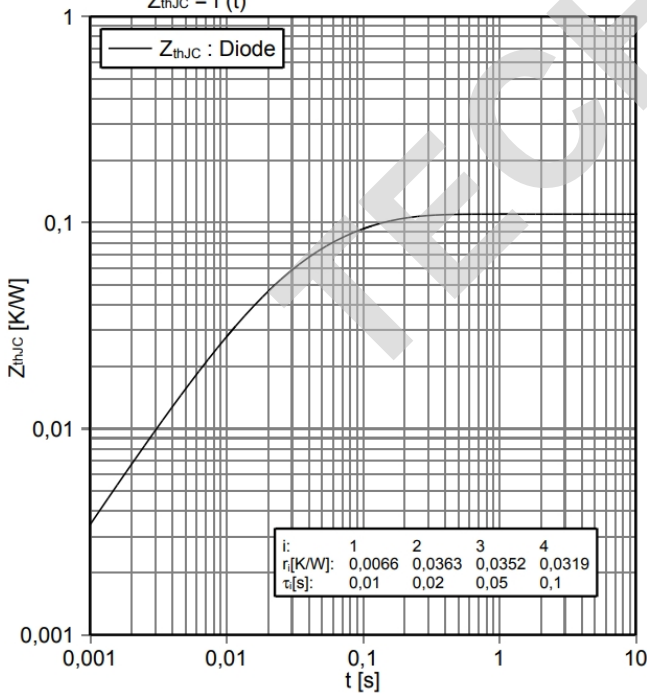
switching losses Diode, Inverter (typical)

$E_{rec} = f(R_G)$   
 $I_F = 400 A, V_{CE} = 600 V$



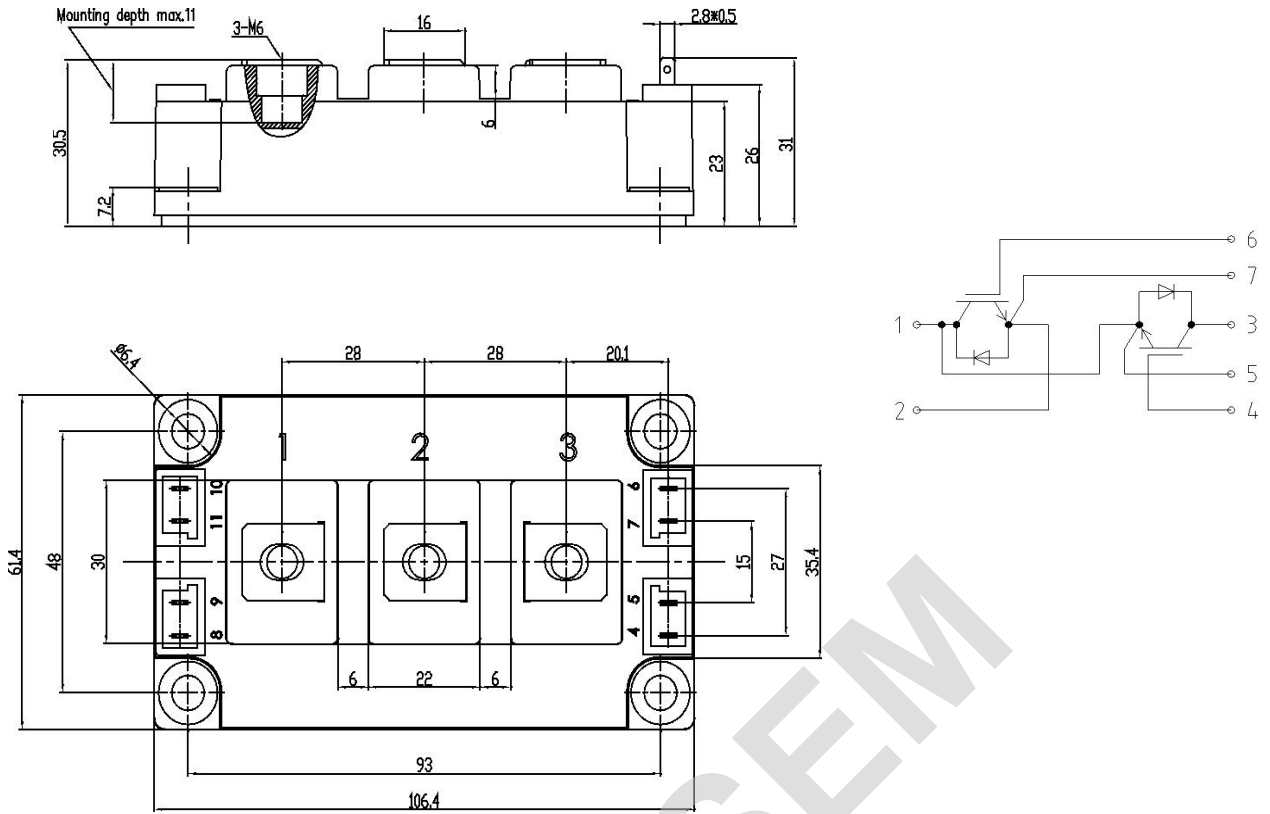
Wechselrichter transient thermal impedance Diode, Inverter

$Z_{thJC} = f(t)$



i:	1	2	3	4
ri [K/W]:	0,0066	0,0363	0,0352	0,0319
ti [s]:	0,01	0,02	0,05	0,1

Outline:



Unmarked dimensional tolerance: ±0.5mm

TECHSEM reserves the right to change specifications without notice.