Features

- V_{CES}=1200V
- $I_{C\ nom}$=450A / I_{CRM}=900A
- Low switching losses
- Low inductance
- Fast switching and short tail current
- High power and thermal cycling capability
- Al_2O_3 substrate with low thermal resistance
- Copper base plate

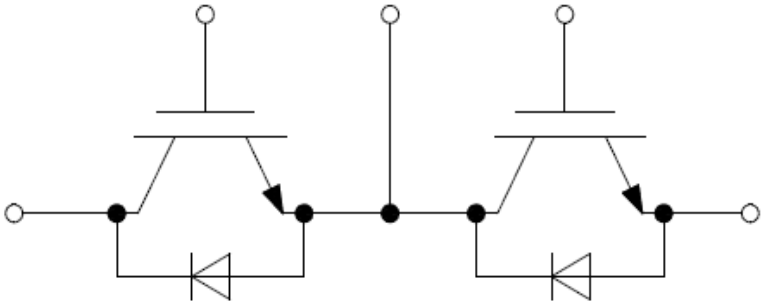
V_{CES}	1200V
I_C@ T_C=85°C T_{vjmax}=150°C	450A
V_{CESat} Typ @V_{GE}=15V I_C=450A, T_{vj}=25°C	1.45V
E_{off}@T_{vj}=25℃	45.3mJ

Application

- Switching mode power supply
- Drive inverters with brake system
- Uninterruptible power supply
- AC and DC servo drive amplifier

62MM

Description



Half Bridge

Device Type	Device Marking
CIM450T120P62MA	CIM450T120P62MA

IGBT-inverter Maximum Ratings

Parameter	Symbol	Note or test condition	Value	Unit
Collector-emitter voltage	V_{CES}	T_{vj}=25℃	1200	V
Gate-emitter peak voltage	V_{GES}	/	±20	V
Continuous DC collector current	$I_{C\ nom}$	T_C=85℃ $T_{vj,max}$=150℃	450	A
Repetitive peak collector current	I_{CRM}	t_P=1ms	1200	A
Total power dissipation	P_{tot}	T_C=25℃ $T_{vj,max}$=175℃	1800	W

Electrical Characteristic Values

Parameter	Symbol	Note or test condition		Value			Unit
				Min	Typ	Max	
Gate threshold voltage	$V_{GE,th}$	I_C=17.1mA V_{CE}=V_{GE} T_{vj}=25℃		5.0	5.8	6.5	V
Collector-emitter saturation voltage	$V_{CE,sat}$	V_{GE}=15V I_C=450A	T_{vj}=25℃	/	1.45	1.90	V
			T_{vj}=125℃	/	1.60	/	
			T_{vj}=150℃	/	1.65	/	
Internal gate resistor	R_{Gint}	T_{vj}=25℃		/	0.7	/	Ω
Input capacitance	C_{ies}	f=1MHz V_{CE}=25V V_{GE}=0V T_{vj}=25℃		/	64	/	nF
Reverse transfer capacitance	C_{res}			/	0.5	/	
Collector-emitter cut-off current	I_{CES}	V_{CE}=1200V V_{GE}=0V T_{vj}=25℃		/	/	3	mA
Gate-emitter leakage current	I_{GES}	V_{CE}=0V V_{GE}=20V T_{vj}=25℃		/	/	300	nA
Gate charge	Q_G	V_{GE}=-15V ...+15V		/	5.2	/	μC

Continue

Parameter	Symbol	Note or test condition		Value		Unit
				Typ.	Max.	
Turn-on delay time, inductive load	$t_{d,on}$	I_C=450A V_{CE}=600V V_{GE}=±15V $R_{G,on}$=1.6Ω	T_{vj}=25℃	0.17	/	us
			T_{vj}=125℃	0.19	/	
			T_{vj}=150℃	0.20	/	
Rise time, inductive load	t_r		T_{vj}=25℃	0.08	/	us
			T_{vj}=125℃	0.09	/	
			T_{vj}=150℃	0.09	/	
Turn-off delay time, inductive load	$t_{d,off}$	I_C=450A V_{CE}=600V V_{GE}=±15V R_{Goff}=1.6Ω	T_{vj}=25℃	0.50	/	us
			T_{vj}=125℃	0.54	/	
			T_{vj}=150℃	0.55	/	
Fall time, inductive load	t_f		T_{vj}=25℃	0.18	/	us
			T_{vj}=125℃	0.31	/	
			T_{vj}=150℃	0.45	/	
Turn-on energy loss per pulse	E_{on}	I_C=450A V_{CE}=600V V_{GE}=±15V $R_{G,on}$=1.6Ω Ls=40nH di/dt=4200A/μs (T_{vj}=150℃)	T_{vj}=25℃	19.9	/	mJ
			T_{vj}=125℃	38.0	/	
			T_{vj}=150℃	43.6	/	
Turn-off energy loss per pulse	E_{off}	I_C=450A V_{CE}=600V V_{GE}=±15V $R_{G,off}$=1.6Ω Ls=40nH dv/dt=3800A/μs (T_{vj}=150℃)	T_{vj}=25℃	45.3	/	mJ
			T_{vj}=125℃	58.8	/	
			T_{vj}=150℃	61.7	/	
SC data	I_{SC}	V_{GE}≤15V, V_{CC}=600 V t_p≤8μs, T_{vj}=150°C , C_{GE}=0.0uF V_{CEmax}=V_{CES} -L_{sCE}·di/dt		2640	/	A
Thermal resistance, junction to case	$R_{th,JC}$	Per IGBT		/	0.083	K/W

Diode-Inverter Maximum Ratings

Parameter	Symbol	Note or test condition	Value			Unit
			Min	Typ	Max	
Repetitive peak reverse voltage	V_{RRM}	T_{vj}=25℃	/	/	1200	V
Continuous DC forward current	I_F	/	/	/	450	A
Repetitive peak forward current	I_{FRM}	t_p=1ms	/	/	900	A

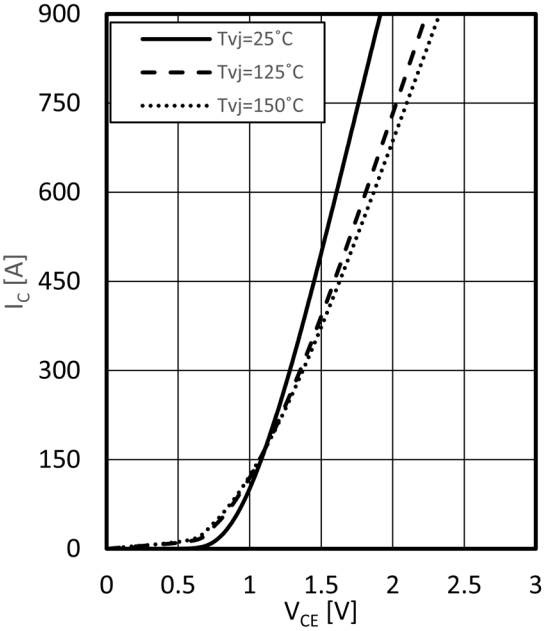
Characteristic Values

Parameter	Symbol	Note or test condition		Value			Unit
				Min	Typ	Max	
Forward voltage	V_F	I_F=450A V_{GE}=0V	T_{vj}=25℃	/	2.00	2.40	V
			T_{vj}=125℃	/	1.65	/	
			T_{vj}=150℃	/	1.60	/	
Peak reverse recovery current	I_{RM}	I_F=450A -di$_F$/dt=1200A/μs (T_{vj}=150℃) V_R=600V V_{GE}=-15V	T_{vj}=25℃	/	270	/	A
			T_{vj}=125℃	/	380	/	
			T_{vj}=150℃	/	390	/	
Recovered charge	Q_r		T_{vj}=25℃	/	28.5	/	μC
			T_{vj}=125℃	/	69.3	/	
			T_{vj}=150℃	/	73.7	/	
Reverse recovery energy	E_{rec}		T_{vj}=25℃	/	7.3	/	mJ
			T_{vj}=125℃	/	17.0	/	
			T_{vj}=150℃	/	20.4	/	
Thermal resistance, junction to case	$R_{th,JC}$	Per diode		/	/	0.164	K/W

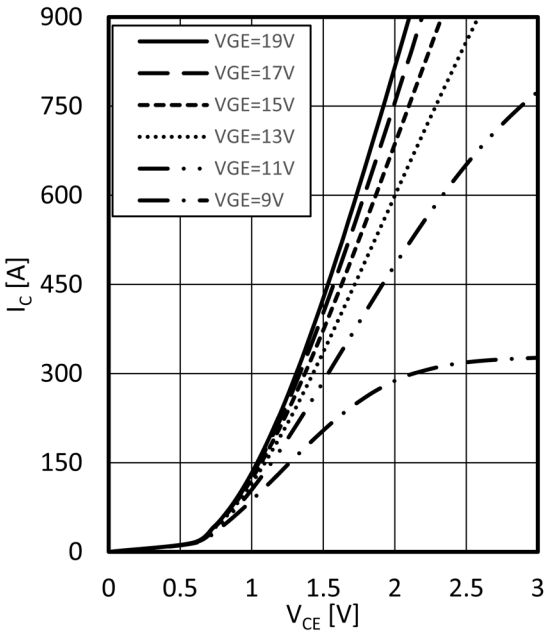
Module

Parameter	Symbol	Note or test condition	Value	Unit
Isolation Voltage	V_{ISOL}	RMS f=50Hz t=1min	2500	V
Stray inductance module	L_{SCE}	/	20	nH
Mounting Torque	M	Screw M6	3.0~6.0	N.m
Weight of Module	G	/	340	g
Operation Junction Temperature	T_{jop}	/	-40~+150	℃
Storage Temperature Range	T_{stg}	/	-40~+125	℃
Terminal Connection Torque	M	Screw M6	2.5~5.0	N.m

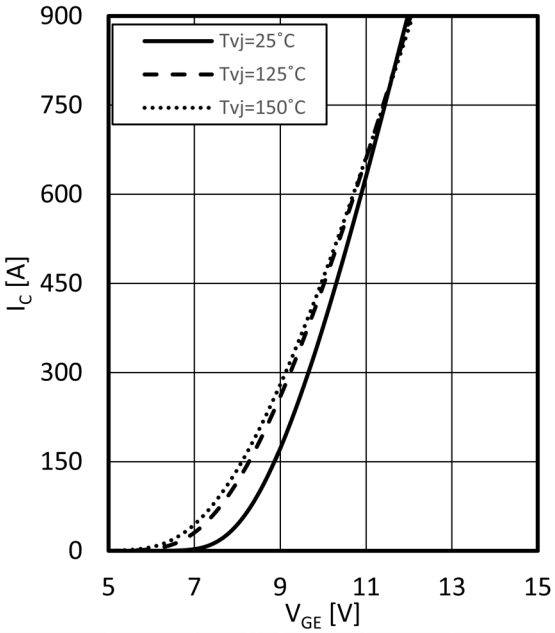
Characteristic diagram



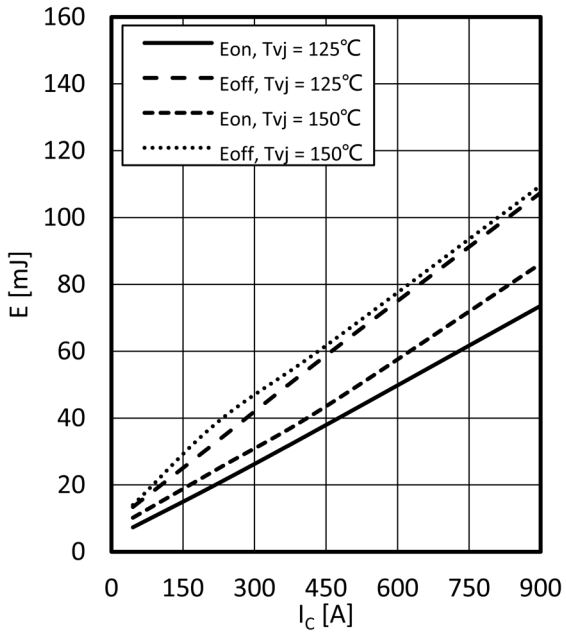
Output characteristic IGBT,inverter (typical)
$I_C = f(V_{CE})$
$V_{GE} = 15V$



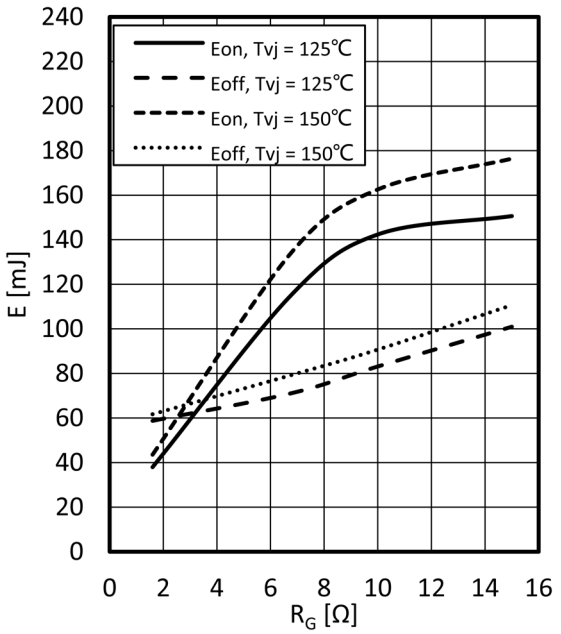
Output characteristic IGBT,inverter (typical)
$I_C = f(V_{CE})$
$T_{vj} = 150°C$



Transfer characteristic IGBT,inverter (typical)
$I_C = f(V_{GE})$
$V_{CE} = 20V$



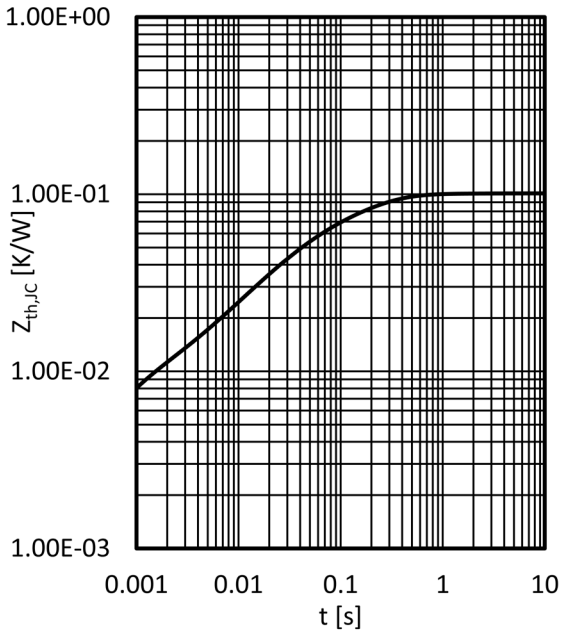
Switching losses IGBT,inverter (typical)
$E_{on} = f(I_C)$ $E_{off} = f(I_C)$
$V_{GE} = \pm 15V$, $R_{Gon} = 1.6\Omega$, $R_{Goff} = 1.6\Omega$, $V_{CE} = 600V$



Switching losses IGBT,inverter (typical)

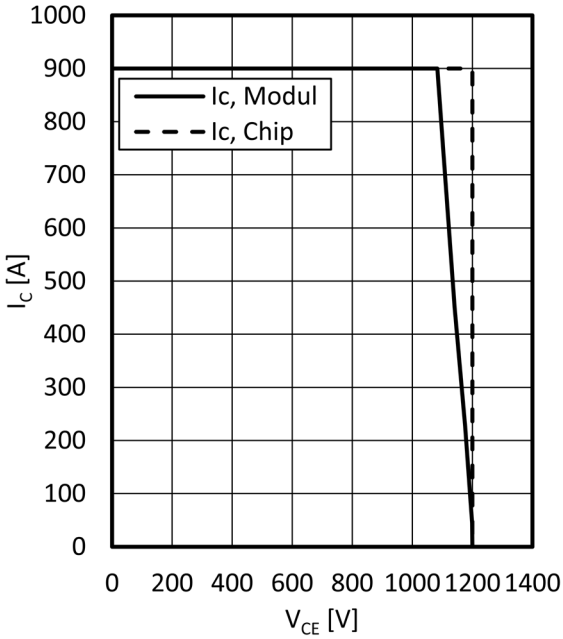
E_{on} = f (R_G) E_{off} = f (R_G)

I_C =450A, V_{CE} = 600V, V_{GE} = ±15V



Transient thermal impedance IGBT,inverter

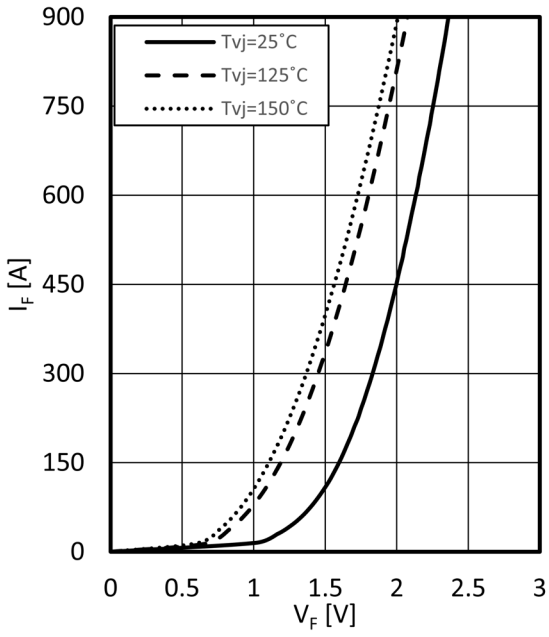
Z_{thJC}= f (t)



Reverse bias safe operating area IGBT,inverter(RBSOA)

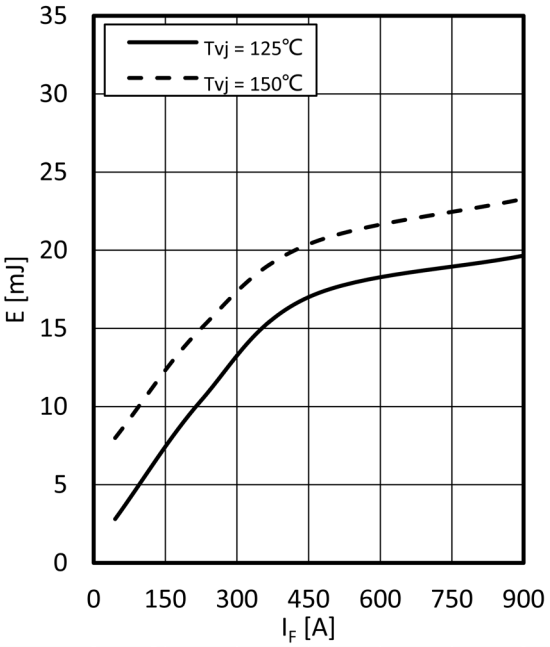
I_C =f (V_{CE})

V_{GE} = ±15V, R_{Goff} = 1.6 Ω, Tvj = 150°C



Forward characteristic of Diode,inverter(typical)

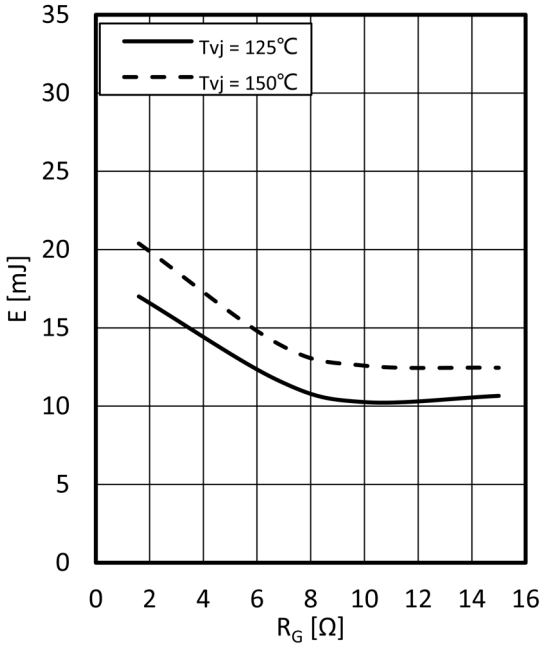
I_F =f (V_F)



Switching losses Diode,inverter(typical)

E_{rec} =f (I_F)

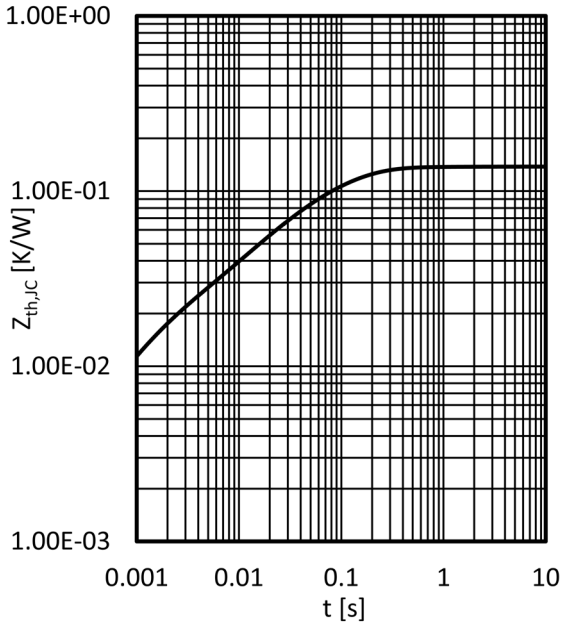
R_{Gon}= 1.6 Ω, V_{CE} = 600V



Switching losses Diode,inverter(typical)

E_{rec} = f (R_G)

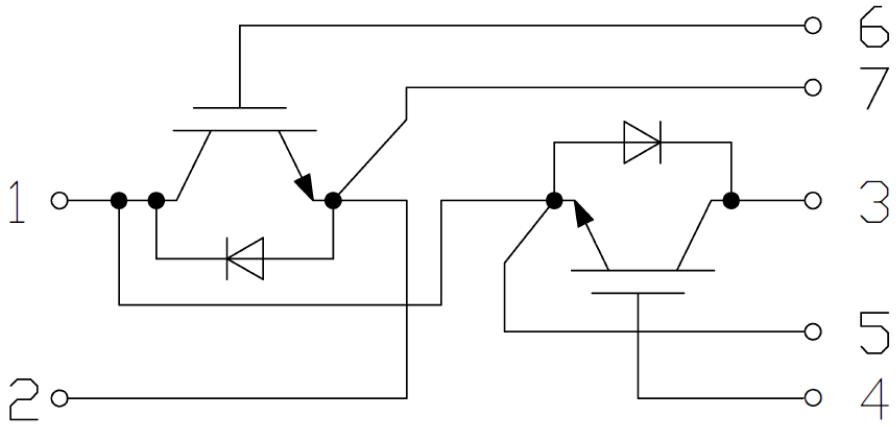
I_F =450A, V_{CE} = 600V



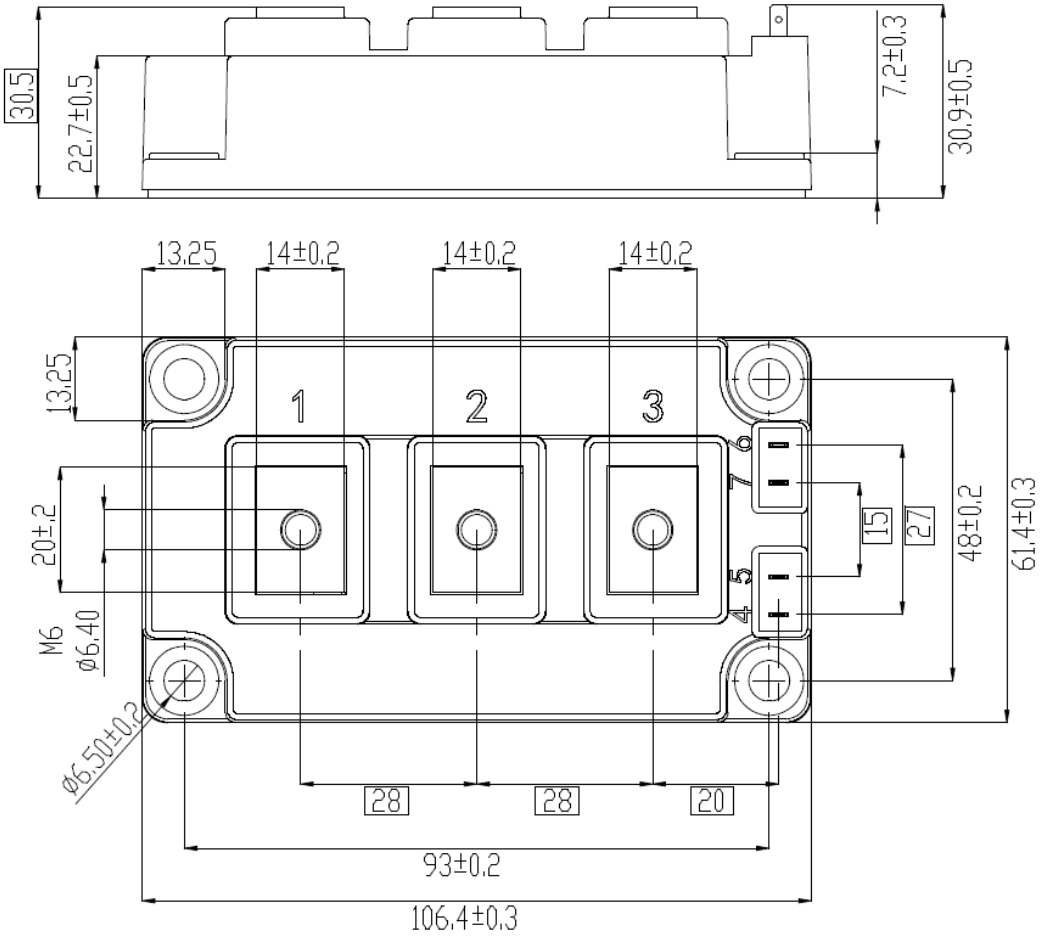
Transient thermal impedance Diode,inverter

Z_{thJC}= f (t)

Circuit diagram



Package



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