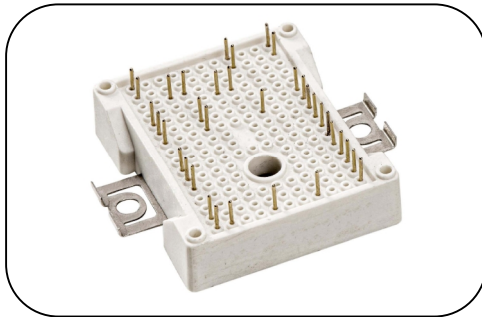


**Features:**

- Trench&field stop technology
- 10us short circuit capability
- Low switching losses
- $V_{CE(sat)}$ with Positive temperature coefficient
- Fast & soft reverse recovery anti-parallel FWD

Typical Applications:

- Inverter for motor drive(VFD)
- AC and DC servo drive amplifier
- Uninterruptible power supply

IGBT, Inverter

SYMBOL	CHARACTERISTIC	TEST CONDITIONS		VALUE			UNIT
				Min	Type	Max	
V _{CES}	Collector-Emitter voltage	T _J =25 C				1200	V
V _{GES}	Gate-Emitter voltage	T _J =25 C				±20	V
I _C	Collector current	Continuous@ T _c =100 C				35	A
I _{CRM}		t _p =1ms				70	A
P _{tot}	Total power dissipation	T _C = 25°C, T _{vjmax} =175 C				215	W
V _{GE(th)}	Gate-Emitter threshold voltage	T _J =25 C ,V _{CE} =20V, I _C =1.20mA		5.2	5.8	6.4	V
V _{CE(sat)}	Collector-Emitter saturation voltage	T _J =25 C ,V _{GE} =15V, I _C =35A			1.85	2.25	V
		T _J =25 C ,V _{GE} =15V, I _C =35A			2.15		V
		T _J =25 C ,V _{GE} =15V, I _C =35A			2.25		V
Q _g	Gate Charge	V _{GE} = ± 15V			0.27		μC
R _{Gint}	Integrated gate resistor	T _J =25 C			2		Ω
C _{ies}	Input capacitance	T _J =25 C ,V _{CE} =25V, V _{GE} =0V, f=1MHz			2.00		nF
C _{oes}	output capacitance				1.80		nF
C _{res}	Reverse transfer capacitance				0.07		nF
I _{CES}	Zero gate voltage collector current			T _J =25 C ,V _{CE} =1200V, V _{GE} =0V			
I _{GES}	Gate-Emitter leakage current	T _J =25 C ,V _{CE} =0V, V _{GE} =±20V		-0.4		0.4	μA
t _{(d)on}	Turn-on time	V _{CC} =600V, I _C =35A, V _{GE} =±15V, R _{gon} =12Ω, Inductive load	T _J =25 C		25		ns
			T _J =125 C		25		ns
			T _J =150 C		25		ns
t _r			T _J =25 C		13		ns
			T _J =125 C		16		ns
			T _J =150 C		18		ns
t _{(d)off}	Turn-off time	V _{CC} =600V, I _C =35A, V _{GE} =±15V, R _{goff} =12Ω, Inductive load	T _J =25 C		240		ns
			T _J =125 C		295		ns
			T _J =150 C		310		ns
t _f			T _J =25 C		115		ns
			T _J =125 C		170		ns
			T _J =150 C		200		ns
E _{on}		I _C =35 A, V _{CE} =600V, L _S =35nH, V _{GE} =±15 V, di/dt=2500A/μs (T _{vj} = 150°C), R _{Gon} =12 Ω	T _J =25 C		1.90		mJ
			T _J =125 C		2.90		mJ
			T _J =150 C		3.15		mJ
E _{off}		I _C =35 A, V _{CE} =600V, L _S =35nH, V _{GE} =±15 V, di/dt=3600A/μs (T _{vj} = 150°C), R _{Goff} =12 Ω	T _J =25 C		2.00		mJ
			T _J =125 C		2.90		mJ
			T _J =150 C		3.20		mJ

I_{sc}	Short circuit withstand current	$V_{GE}=15V, V_{CC}=900V, V_{CEmax}=V_{CES}-L_{sCE} \cdot di/dt,$ $t_p \leq 10\mu s, T_{vj}=150^\circ C$		130		A
$R_{th(j-c)}$	Thermal resistance, junction to case	per IGBT		0.60	0.70	$^\circ C/W$
$R_{th(c-h)}$	Thermal resistance, case to heatsink			0.60		$^\circ C/W$
T_{Vjop}	Junction temperature	/	-40		150	$^\circ C$
T_{stg}	Storage temperature		-40		125	$^\circ C$
F	mounting force per clamp		40		80	N
W_t	Weight			39		g

Diode, Inverter

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT
			Min	Type	Max	
V _{RRM}	Repetitive peak reverse voltage	T _{vj} =25°C			1200	V
I _F	Continuous DC forward current				35	A
I _{FRM}	Repetitive peak forward current				70	A
I ² t	I ² t - value	V _R =0V, t _p =10ms, T _{vj} =150°C			220	A²s
V _F	Forward on voltage	I _F =35A	T _J =25 C	1.65	2.15	V
			T _J =125 C	1.65		V
			T _J =150 C	1.65		V
I _{RRM}	Max. reverse recovery current	I _F =35A , - di _F /dt=2500A/ μ s, V _R =600V	T _J =25 C	81		A
			T _J =125 C	85		A
			T _J =150 C	88		A
Q _r	Recovered charge	I _F =35A , - di _F /dt=2500A/ μ s, V _R =600V	T _J =25 C	3.95		μC
			T _J =125 C	6.80		μC
			T _J =150 C	7.50		μC
E _{rec}	Reverse recovery energy	I _F =35A , - di _F /dt=2500A/ μ s, V _R =600V	T _J =25 C	1.50		mJ
			T _J =125 C	2.70		mJ
			T _J =150 C	2.95		mJ
R _{th(j-c)}	Thermal resistance, junction to case	per diode		0.80	0.90	°C/W
R _{th(c-h)}	Thermal resistance, case to heatsink			0.75		°C/W
T _{Vjop}	Junction temperature	/	-40		150	°C

Diode, Rectifier

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT
			Min	Type	Max	
V_{RRM}	Repetitive peak reverse voltage	$T_{vj}=25^\circ C$			1600	V
I_{FRMSM}	Maximum RMS forward current per chip	$T_C=100^\circ C$			60	A
I_{RMSM}	Maximum RMS current at rectifier output	$T_C=100^\circ C$			60	A
I_{FSM}	Surge forward current	$t_p=10ms, T_{vj}=150^\circ C$			370	A
I^2t	I^2t - value	$V_R=0V, t_p=10ms, T_{vj}=150^\circ C$			685	A^2s
V_F	Forward on voltage	$I_F=35A, T_j=150^\circ C$		0.95		V
I_R	reverse current	$V_R=1600V, T_j=150^\circ C$		1.0		mA
$R_{th(j-c)}$	Thermal resistance, junction to case	per diode		1.05	1.15	$^\circ C/W$
$R_{th(c-h)}$	Thermal resistance, case to heatsink			0.95		$^\circ C/W$
T_{Vjop}	Junction temperature	/	-40		150	$^\circ C$

IGBT, Brake-Chopper

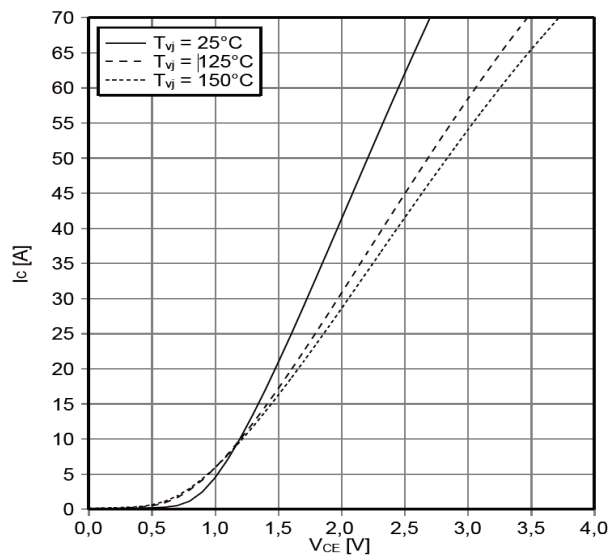
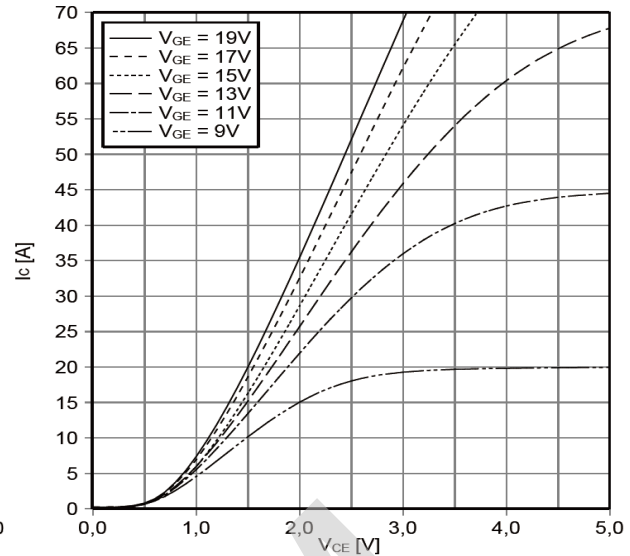
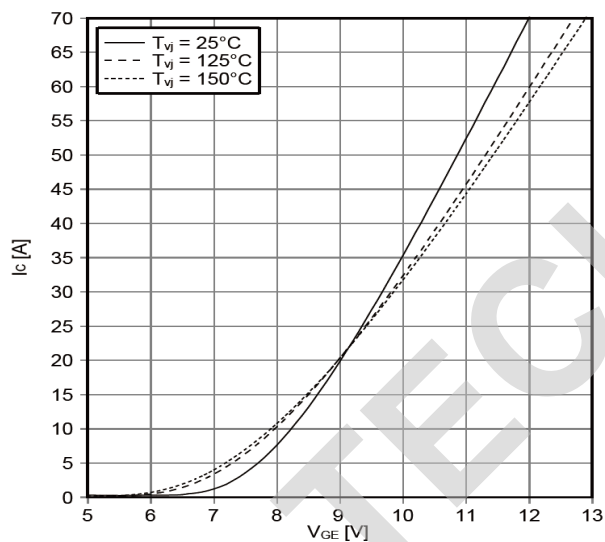
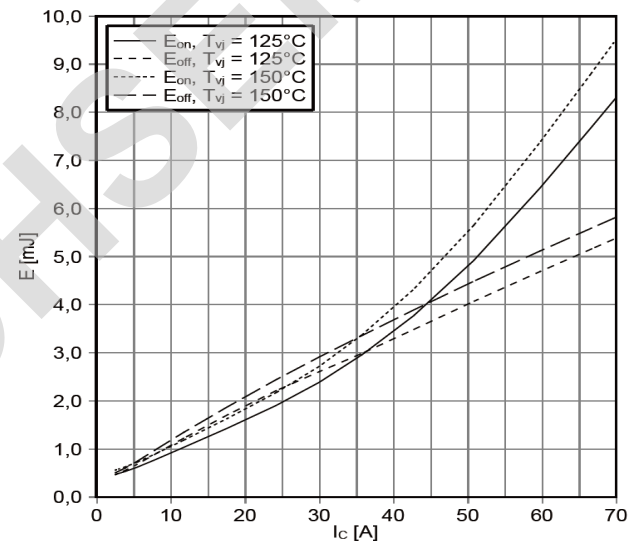
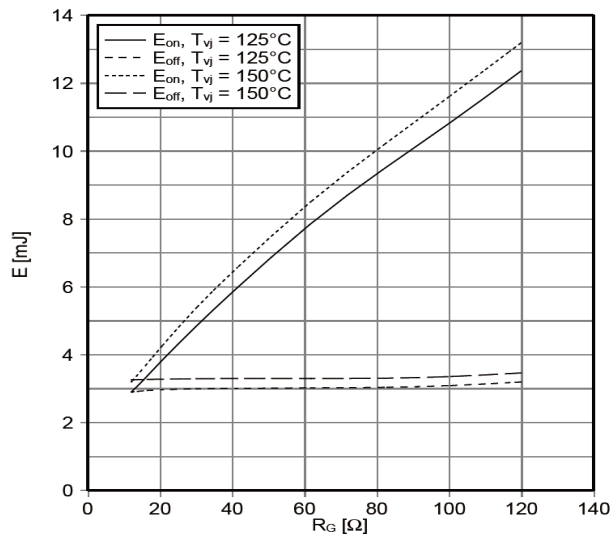
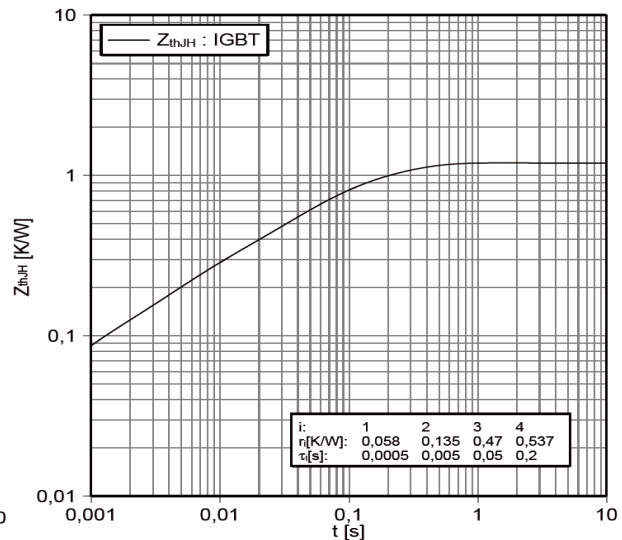
SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT	
			Min	Type	Max		
V _{CES}	Collector-Emitter voltage	T _J =25 C			1200	V	
V _{GES}	Gate-Emitter voltage	T _J =25 C			±20	V	
I _C	Collector current	Continuous@ T _c =100 C			54	A	
I _{CRM}		t _p =1ms			70	A	
P _{tot}	Total power dissipation	T _C = 25°C, T _{vjmax} =175 C			175	W	
V _{GE(th)}	Gate-Emitter threshold voltage	T _J =25 C ,V _{CE} =20V, I _C =1.20mA	5.2	5.8	6.4	V	
V _{CE(sat)}	Collector-Emitter saturation voltage	T _J =25 C ,V _{GE} =15V, I _C =35A		1.85	2.25	V	
		T _J =25 C ,V _{GE} =15V, I _C =35A		2.15		V	
		T _J =25 C ,V _{GE} =15V, I _C =35A		2.25		V	
Q _g	Gate Charge	V _{GE} = ± 15V		0.27		μC	
R _{Gint}	Integrated gate resistor	T _J =25 C		0		Ω	
C _{ies}	Input capacitance	T _J =25 C ,V _{CE} =25V, V _{GE} =0V, f=1MHz		2.00		nF	
C _{res}	Reverse transfer capacitance			0.07		nF	
I _{CES}	Zero gate voltage collector current	T _J =25 C ,V _{CE} =1200V, V _{GE} =0V			1.0	mA	
I _{GES}	Gate-Emitter leakage current	T _J =25 C ,V _{CE} =0V, V _{GE} =±20V	-0.4		0.4	μA	
t _{(d)on}	Turn-on time	V _{CC} =600V, I _C =35A, V _{GE} =±15V, R _{gon} =47Ω, Inductive load	T _J =25 C		70		ns
			T _J =125 C		70		ns
			T _J =150 C		70		ns
t _r			T _J =25 C		45		ns
			T _J =125 C		50		ns
			T _J =150 C		57		ns
t _{(d)off}	Turn-off time	V _{CC} =600V, I _C =35A, V _{GE} =±15V, R _{goff} =47Ω, Inductive load	T _J =25 C		280		ns
			T _J =125 C		440		ns
			T _J =150 C		450		ns
t _f			T _J =25 C		115		ns
			T _J =125 C		175		ns
			T _J =150 C		205		ns
E _{on}		I _C =35 A, V _{CE} =600V, L _S =35nH, V _{GE} =±15 V, R _{Gon} =47 Ω	T _J =25 C		5.00		mJ
			T _J =125 C		6.50		mJ
			T _J =150 C		7.00		mJ
E _{off}		I _C =35 A, V _{CE} =600V, L _S =35nH, V _{GE} =±15 V, R _{Goff} =47 Ω	T _J =25 C		2.10		mJ
			T _J =125 C		3.05		mJ
			T _J =150 C		3.35		mJ
I _{sc}	Short circuit withstand current	V _{GE} =15V, V _{CC} =900V, V _{CEmax} =V _{CES} -L _s CE ·di/dt, t _p ≤10μs, T _{vj} =150°C		130		A	
R _{th(j-c)}	Thermal resistance, junction to case	per IGBT		0.60	0.70	°C/W	
R _{th(c-h)}	Thermal resistance, case to heatsink			0.60		°C/W	
T _{Vjop}	Junction temperature	/	-40		150	°C	

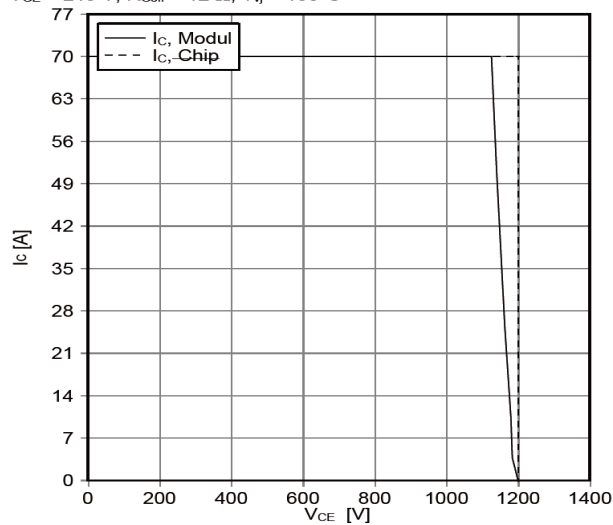
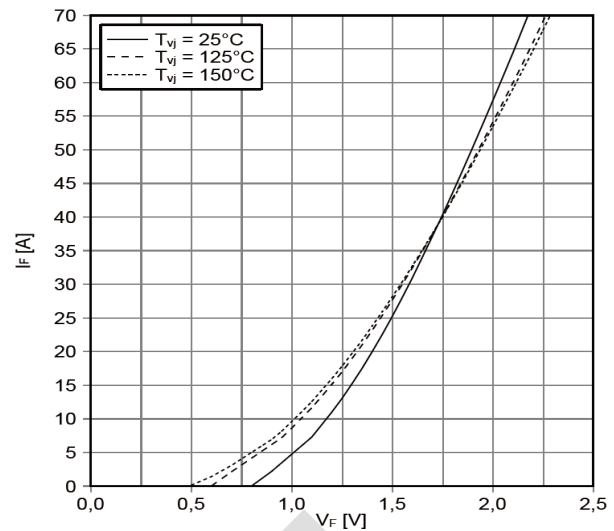
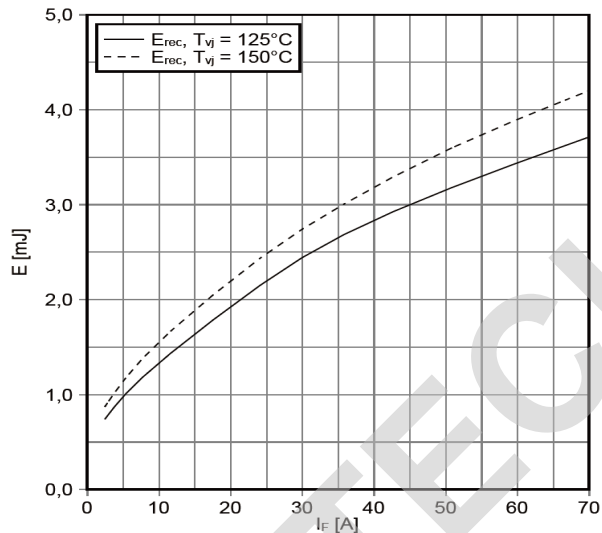
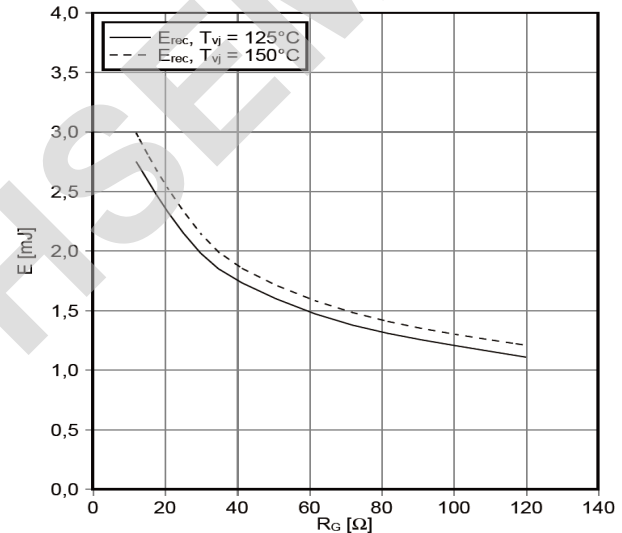
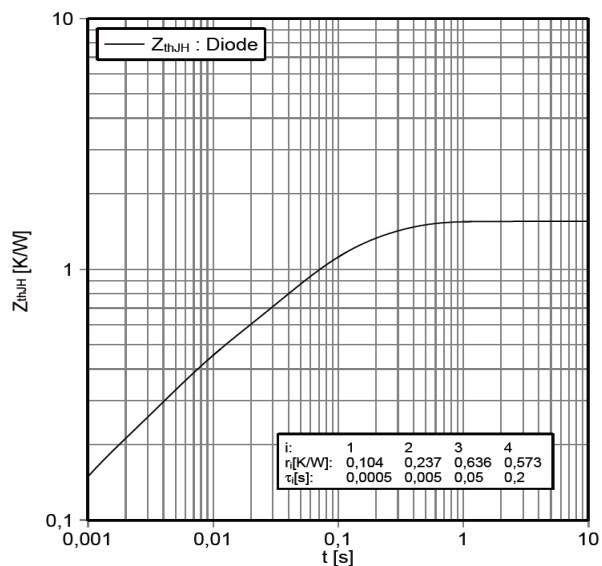
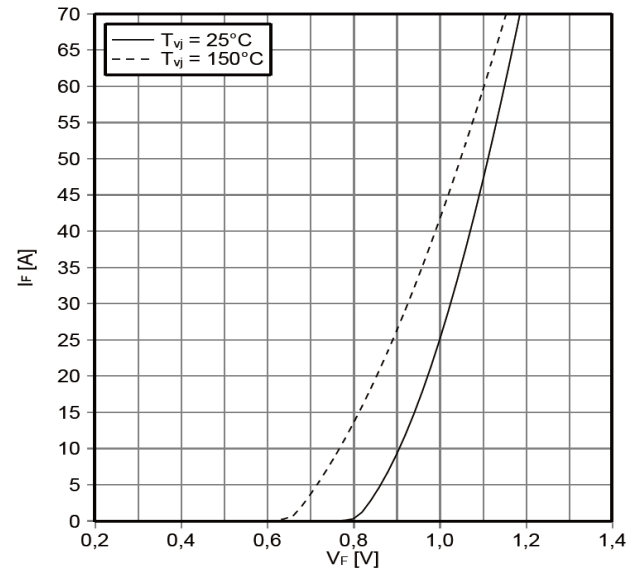
Diode, Brake-Chopper

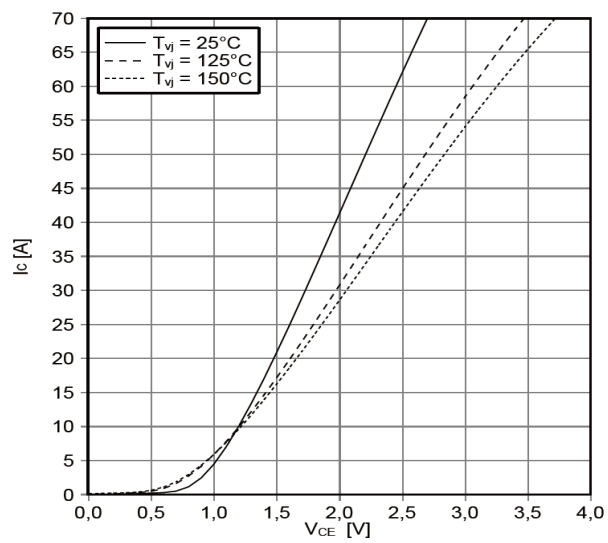
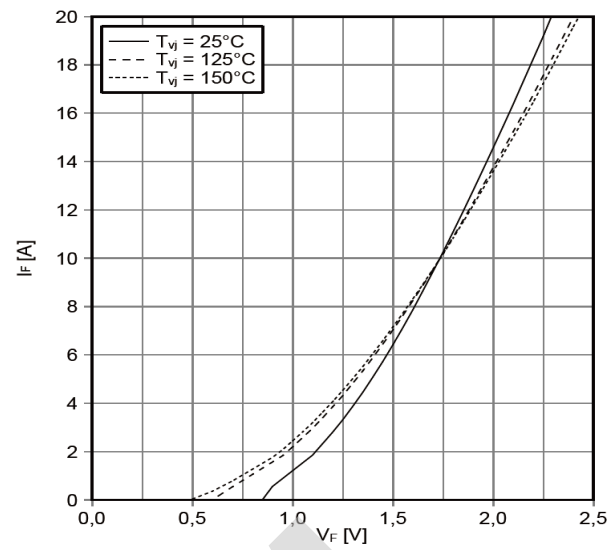
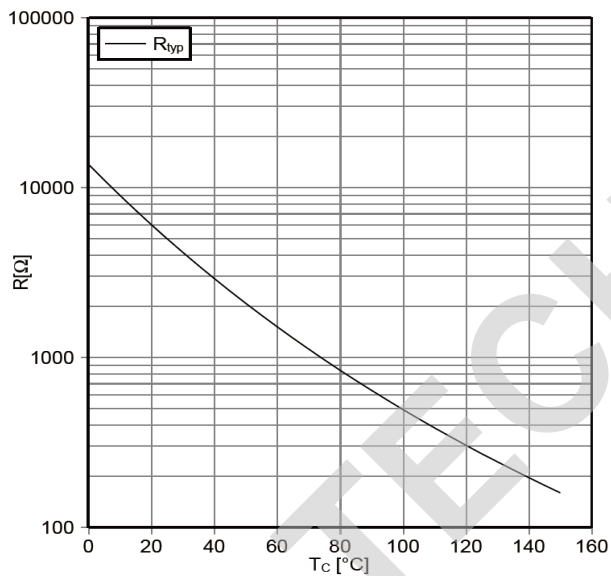
SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT
			Min	Type	Max	
V_{RRM}	Repetitive peak reverse voltage	$T_{vj}=25^{\circ}\text{C}$			1200	V
I_F	Continuous DC forward current				10	A
I_{FRM}	Repetitive peak forward current				20	A
I^2t	I^2t - value	$V_R=0\text{V}$, $t_P=10\text{ms}$, $T_{vj}=150^{\circ}\text{C}$			14	A^2s
V_F	Forward on voltage	$I_F=10\text{A}$, $V_{GE}=0\text{V}$	$T_j=25^{\circ}\text{C}$	1.75	2.25	V
			$T_j=125^{\circ}\text{C}$	1.75		V
			$T_j=150^{\circ}\text{C}$	1.75		V
I_{RRM}	Max. reverse recovery current	$I_F=10\text{A}$, $-di_F/dt=500\text{A}/\mu\text{s}$, ($T_{vj}=150^{\circ}\text{C}$), $V_R=600\text{V}$	$T_j=25^{\circ}\text{C}$	12		A
			$T_j=125^{\circ}\text{C}$	10		A
			$T_j=150^{\circ}\text{C}$	8		A
Q_r	Recovered charge	$I_F=10\text{A}$, - $di_F/dt=500\text{A}/\mu\text{s}$, $V_R=600\text{V}$	$T_j=25^{\circ}\text{C}$	0.90		μC
			$T_j=125^{\circ}\text{C}$	1.70		μC
			$T_j=150^{\circ}\text{C}$	1.90		μC
E_{rec}	Reverse recovery energy	$I_F=10\text{A}$, - $di_F/dt=500\text{A}/\mu\text{s}$, $V_R=600\text{V}$	$T_j=25^{\circ}\text{C}$	0.24		mJ
			$T_j=125^{\circ}\text{C}$	0.52		mJ
			$T_j=150^{\circ}\text{C}$	0.59		mJ
$R_{th(j-c)}$	Thermal resistance, junction to case	per diode		1.75	1.90	$^{\circ}\text{C}/\text{W}$
$R_{th(c-h)}$	Thermal resistance, case to heatsink			1.30		$^{\circ}\text{C}/\text{W}$
T_{vjop}	Junction temperature	/	-40		150	$^{\circ}\text{C}$

NTC-Thermistor

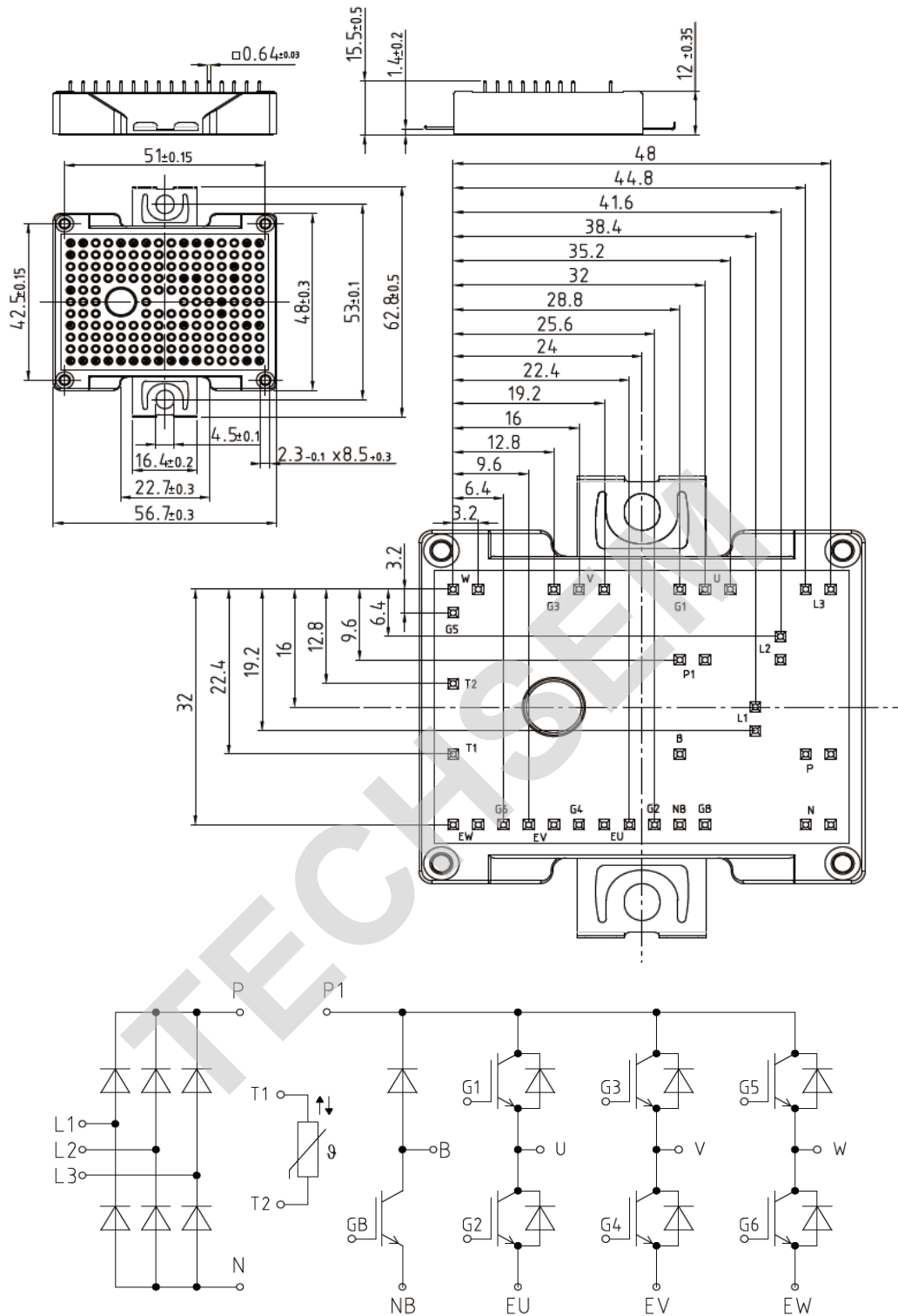
SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT
			Min	Type	Max	
R_{25}	Rated resistance	$T_c=25^{\circ}\text{C}$		5.00		$\text{k}\Omega$
$\Delta R/R$	Deviation of R_{100}	$T_c=100^{\circ}\text{C}$, $R_{100}=493\text{W}$	-5		5	%
P_{25}	Power dissipation	$T_c=25^{\circ}\text{C}$			20.0	mW
$B_{25/50}$	B-value	$R_2=R_{25} \exp [B_{25/50}(1/T_2-1/(298,15\text{K}))]$		3375		K
$B_{25/80}$		$R_2=R_{25} \exp [B_{25/80}(1/T_2-1/(298,15\text{K}))]$		3411		K
$B_{25/100}$		$R_2=R_{25} \exp [B_{25/100}(1/T_2-1/(298,15\text{K}))]$		3433		K

output characteristic IGBT, Inverter (typical)
 $I_C = f(V_{CE})$
 $V_{GE} = 15\text{ V}$
**output characteristic IGBT, Inverter (typical)**
 $I_C = f(V_{CE})$
 $T_{vj} = 150^\circ\text{C}$
**transfer characteristic IGBT, Inverter (typical)**
 $I_C = f(V_{GE})$
 $V_{CE} = 20\text{ V}$
**switching losses IGBT, Inverter (typical)**
 $E_{on} = f(I_C)$, $E_{off} = f(I_C)$
 $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 12\ \Omega$, $R_{Goff} = 12\ \Omega$, $V_{CE} = 600\text{ V}$
**switching losses IGBT, Inverter (typical)**
 $E_{on} = f(R_G)$, $E_{off} = f(R_G)$
 $V_{GE} = \pm 15\text{ V}$, $I_C = 35\text{ A}$, $V_{CE} = 600\text{ V}$
**transient thermal impedance IGBT, Inverter**
 $Z_{thJH} = f(t)$


reverse bias safe operating area IGBT, Inverter (RBSOA) $I_C = f(V_{CE})$ $V_{GE} = \pm 15 \text{ V}$, $R_{Goff} = 12 \Omega$, $T_{vj} = 150^\circ\text{C}$ **forward characteristic of Diode, Inverter (typical)** $I_F = f(V_F)$ **switching losses Diode, Inverter (typical)** $E_{rec} = f(I_F)$ $R_{Gon} = 12 \Omega$, $V_{CE} = 600 \text{ V}$ **switching losses Diode, Inverter (typical)** $E_{rec} = f(R_G)$ $I_F = 35 \text{ A}$, $V_{CE} = 600 \text{ V}$ **transient thermal impedance Diode, Inverter** $Z_{thJH} = f(t)$ **forward characteristic of Diode, Rectifier (typical)** $I_F = f(V_F)$ 

output characteristic IGBT, Brake-Chopper (typical) $I_C = f(V_{CE})$
 $V_{GE} = 15\text{ V}$ **forward characteristic of Diode, Brake-Chopper (typical)** $I_F = f(V_F)$ **NTC-Thermistor-temperature characteristic (typical)** $R = f(T)$ 

Outline:



Unmarked dimensional tolerance: $\pm 0.5\text{mm}$

TECHSEM reserves the right to change specifications without notice.