

Features:

- Low switching losses
- VCE(sat) with Positive temperature coefficient
- Short circuit rated

Typical Applications:

- Motor drives
- Servo drives
- Auxiliary inverters

Module-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			150	A
I _{CP}		T _P =1ms			300	A
P _{tot}	Power Dissipation Per IGBT				793	W
T _j	Junction temperature	/			175	°C
T _{op}	Operating temperature	/	-40		150	°C
T _{stg}	Storage temperature	/	-40		125	°C
V _{iso}	Isolation between terminal and copper base	T _j =25°C , AC: 1minute	2500			V
I _{CEs}	Zero gate voltage collector current	T _j =25°C , V _{CE} =1200V, V _{GE} =0V			1	mA
		T _j =125°C , V _{CE} =1200V, V _{GE} =0V			5	mA
I _{GES}	Gate-Emitter leakage current	T _j =25°C , V _{CE} =0V, V _{GE} =±20V	-0.4		0.4	µA
V _{GE(th)}	Gate-Emitter threshold voltage	T _j =25°C , V _{CE} =20V, I _c =4mA	5.0	5.8	6.6	V
V _{CE(sat)}	Collector-Emitter saturation voltage	T _j =25°C , V _{GE} =15V, I _c =150A		1.65	2.00	V
		T _j =150°C , V _{GE} =15V, I _c =150A		2.05		V
Q _g	Gate Charge	T _j =25°C , V _{CE} =600V, I _c =150A, V _{GE} =±15V		1.13		µC
C _{ies}	Input capacitance	T _j =25°C , V _{CE} =25V, V _{GE} =0V, f=100kHz		18.3		nF
C _{res}	Reverse transfer capacitance			0.14		nF
t _{(d)on}	Turn-on time	V _{CC} =600V, I _c =150A, V _{GE} =±15V, R _g =1Ω, Inductive load	T _j =25°C	100		ns
			T _j =150°C	110		ns
t _r	T _j =25°C		30		ns	
	T _j =150°C		40		ns	
t _{(d)off}	Turn-off time		T _j =25°C	280		ns
			T _j =150°C	330		ns
t _f			T _j =25°C	190		ns
			T _j =150°C	300		ns
E _{on}	Turn on energy		T _j =25°C	6.10		mJ
			T _j =150°C	13.5		mJ
E _{off}	Turn off energy	T _j =25°C	15.0		mJ	
		T _j =150°C	19.5		mJ	
I _{sc}	Short circuit current	t _p sc ≤ 10µS, V _{GE} =15V, V _{CC} =600V, V _{CEmax} = V _{CEs} - I _{sCE} · di/dt	T _j =150°C	500		A
V _F	Forward on voltage	T _j =25°C , I _F =150A		1.65	2.05	V
		T _j =150°C , I _F =150A		1.65		V
I _{F(AV)}	Average forward current	T _c =100°C		150		A

I _{FRM}	Repetitive peak forward current			300		A
Q _{rr}	Reverse charge	I _F =150A , V _R =600V, V _{GE} =-15V, R _{Gon} =1 Ω , T _{Vj} =150°C		23.5		μ C
I _{RRM}	Max. reverse recovery current			175		A
E _{rec}	Reverse recovery energy			12.5		mJ
R _{th(j-c)}	Thermal resistance(per chip)	IGBT			0.19	°C/W
		FWD			0.34	°C/W
Torque	To-sink	Recommended (M5)	2.4		3	N • m
W _t	Weight			300		g
Outline	M40pb					

Module-Brake

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			100	A
I _{CP}		T _P =1ms			200	A
P _{lot}	Power Dissipation Per IGBT				500	W
I _{CES}	Zero gate voltage collector current	T _j =25°C ,V _{CE} =1200V, V _{GE} =0V			1	mA
		T _j =125°C ,V _{CE} =1200V, V _{GE} =0V			5	mA
I _{GES}	Gate-Emitter leakage current	T _j =25°C ,V _{CE} =0V, V _{GE} =±20V	-0.4		0.4	μA
V _{GE(th)}	Gate-Emitter threshold voltage	T _j =25°C ,V _{CE} =20V, I _c =3.8mA	5.0		6.5	V
V _{CE(sat)}	Collector-Emitter saturation voltage	T _j =25°C ,V _{GE} =15V, I _c =100A		1.70	2.05	V
		T _j =150°C ,V _{GE} =15V, I _c =100A		2.05		V
Q _g	Gate Charge	T _j =25°C ,V _{CE} =600V,I _c =100A,V _{GE} =±15V		0.75		μC
C _{ies}	Input capacitance	T _j =25°C ,V _{CE} =25V, V _{GE} =0V, f=100kHz		8.50		nF
C _{res}	Reverse transfer capacitance			0.07		nF
t _{(d)on}	Turn-on time	V _{CC} =600V, I _c =100A, V _{GE} =±15V, R _g =4.7Ω	T _j =25°C	17		ns
			T _j =150°C	19		ns
t _r	T _j =25°C		50		ns	
	T _j =150°C		50		ns	
t _{(d)off}	Turn-off time		T _j =25°C	350		ns
			T _j =150°C	430		ns
t _f			T _j =25°C	90		ns
			T _j =150°C	180		ns
E _{on}	Turn on energy		T _j =25°C	5.05		mJ
			T _j =150°C	9.30		mJ
E _{off}	Turn off energy	T _j =25°C	6.80		mJ	
		T _j =150°C	9.95		mJ	
I _{sc}	Short circuit current	t _p sc ≤ 10μS, V _{GE} =15V, V _{CC} =600V, V _{CEmax} = V _{CES} -L _{sCE} ·di/dt	T _j =150°C	350		A
V _F	Forward on voltage	T _j =25°C ,I _F =75A		2.10	2.50	V
		T _j =150°C ,I _F =75A		1.75		V
I _{F(AV)}	Average forward current	T _c =100°C		75		A
I _{FRM}	Repetitive peak forward current			150		A
Q _{rr}	Reverse charge	I _F =75A , V _R =600V, V _{GE} =-15V, R _{Gon} =4.7 Ω		9.20		μ C

I_{RRM}	Max. reverse recovery current	$T_{vj}=150^{\circ}C$		87		A
E_{rec}	Reverse recovery energy			4.05		mJ
$R_{th(j-c)}$	Thermal resistance(per chip)	IGBT			0.30	$^{\circ}C/W$
		FWD			0.57	$^{\circ}C/W$
Outline	M40pb					

Diode-Recifier

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT
			Min	Type	Max	
V_F	Forward on voltage	$T_J=25^{\circ}C, I_F=150A$		1.10		V
I_R	Reverse Leakage Current				1	mA
$I_{F(AV)}$	Average Forward Current			150		A
I_{FSM}	Surge Forward Current	$t_p=10ms, T_c=25^{\circ}C, \sin 180^{\circ}$		1320		A
I^2t				8712		A^2s
$R_{th(j-c)}$	Thermal resistance(per chip)	FWD			0.25	$^{\circ}C/W$
Outline	M40pb					

NTC

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT
			Min	Type	Max	
R_{25}	Resistance	$T_{vj}=25^{\circ}C$		5		k Ω
$B_{25/50}$	$R_2=R_{25} \exp [B_{25/50}(1/T_2-1/(298,15K))]$			3375		K

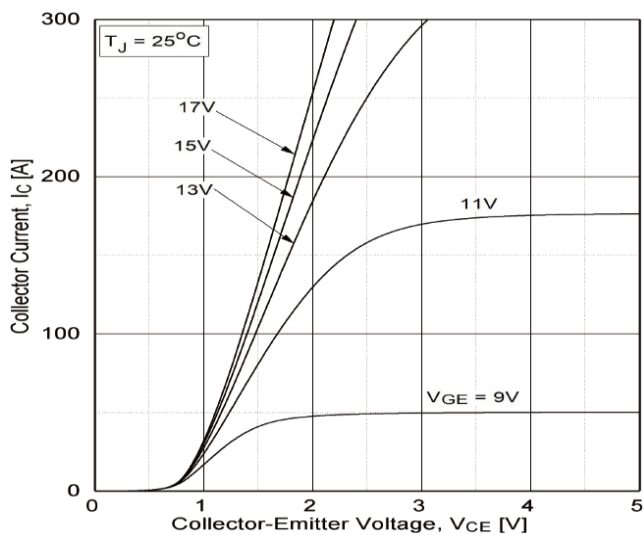


Fig 1, Output Characteristics IGBT, Inverter (typical)

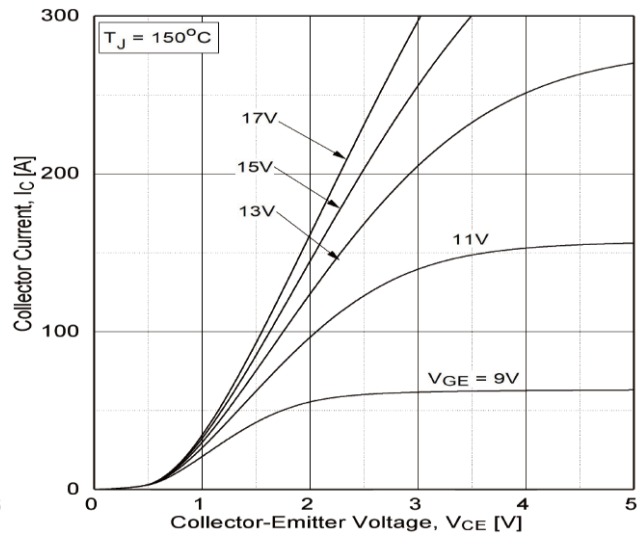


Fig 2, Output Characteristics IGBT, Inverter (typical)

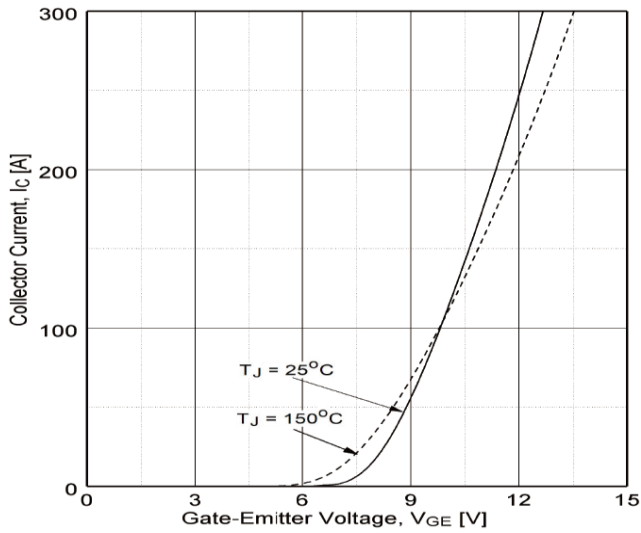


Fig 3, Transfer Characteristics IGBT, Inverter (typical)

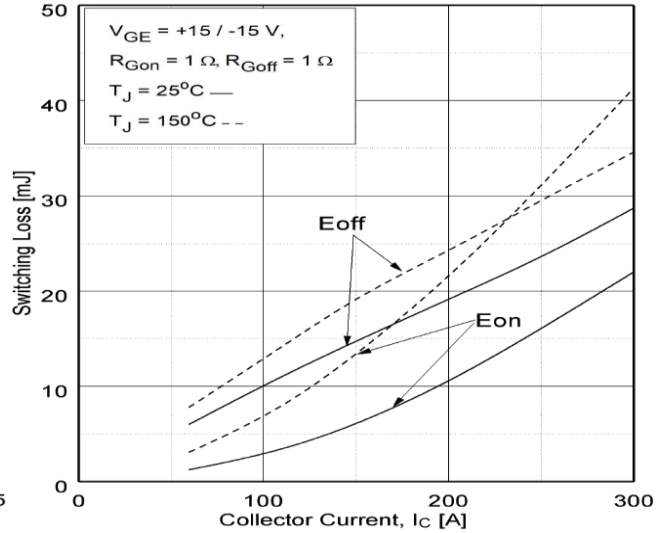


Fig 4, Switching Losses IGBT, Inverter (typical)

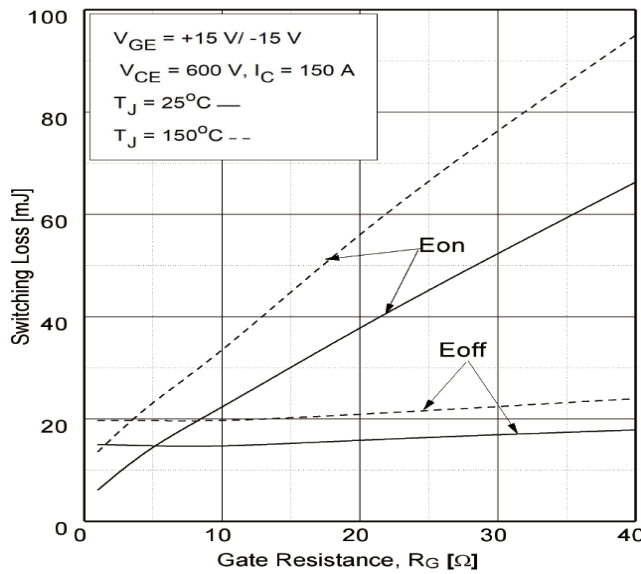


Fig 5, Switching Losses IGBT, Inverter (typical)

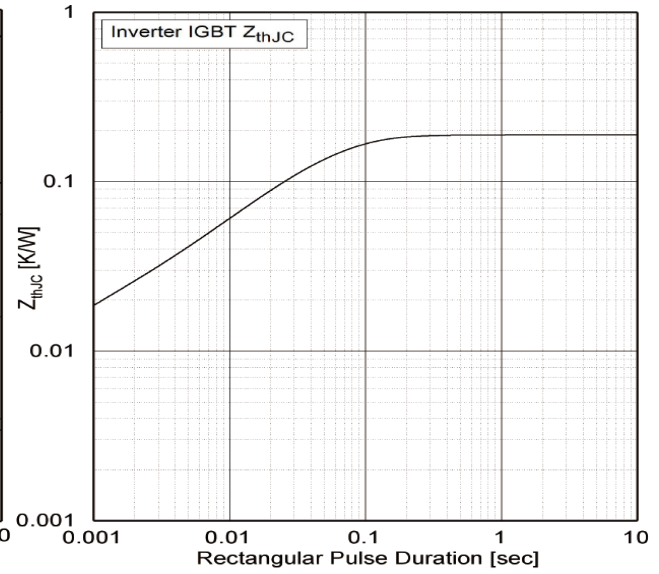


Fig 6, Transient Thermal Impedance IGBT, Inverter

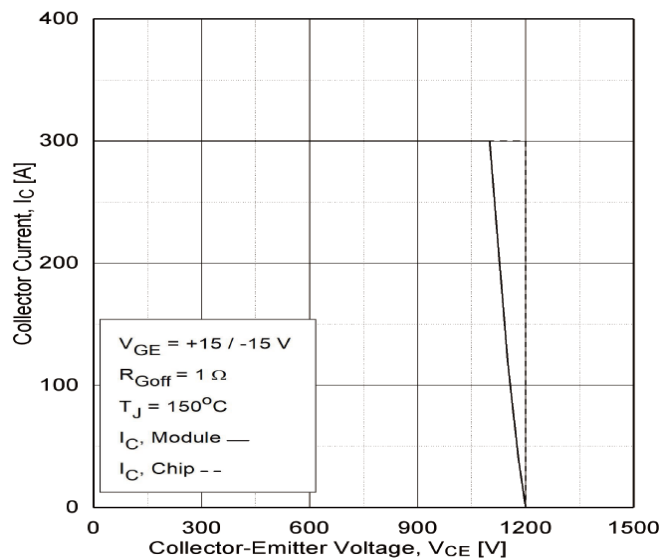


Fig 7, Reverse Bias Safe Operating Area IGBT, Inverter(RBSOA)

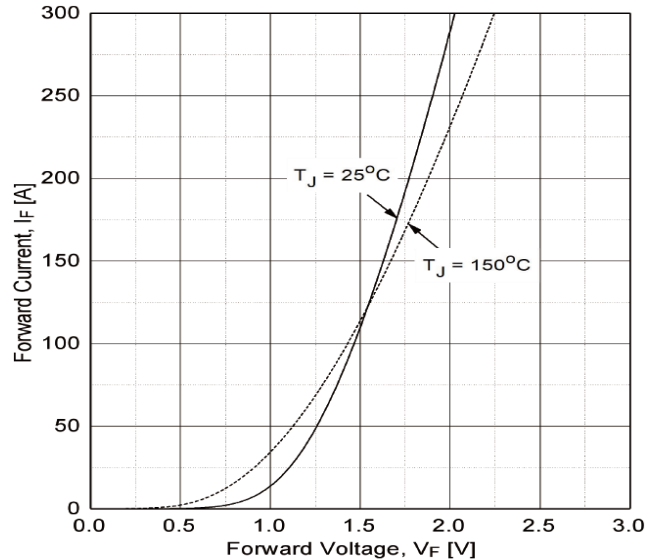


Fig 8, Forward Characteristics of Diode, Inverter (typical)

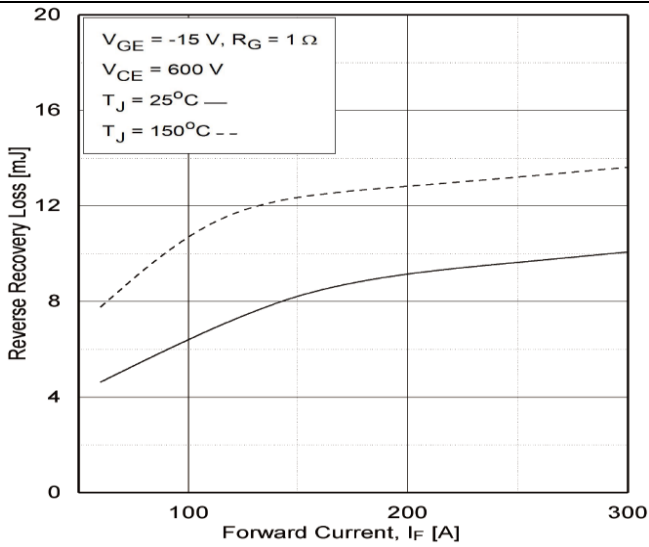


Fig 9, Switching Losses Diode, Inverter (typical)

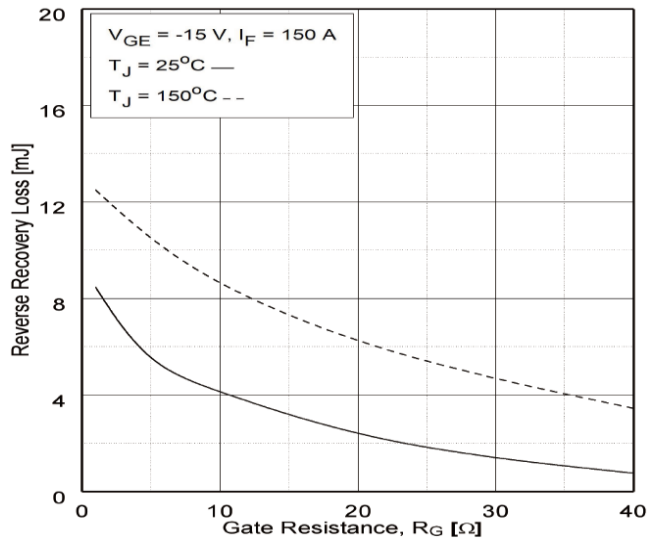


Fig 10, Switching Losses Diode, Inverter (typical)

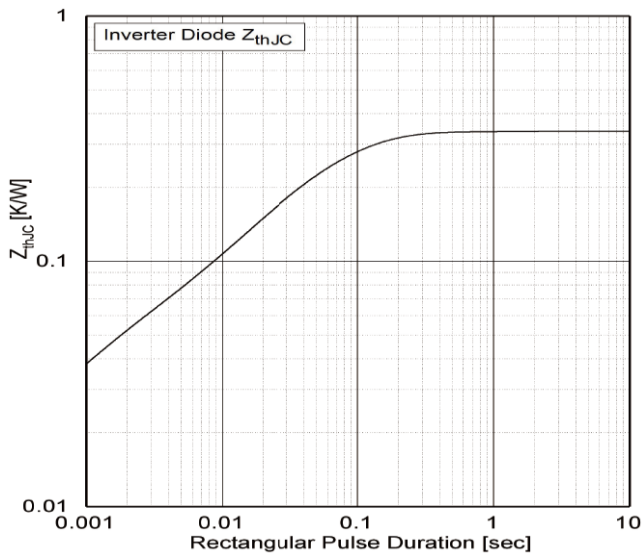


Fig 11, Transient Thermal Impedance Diode, Inverter

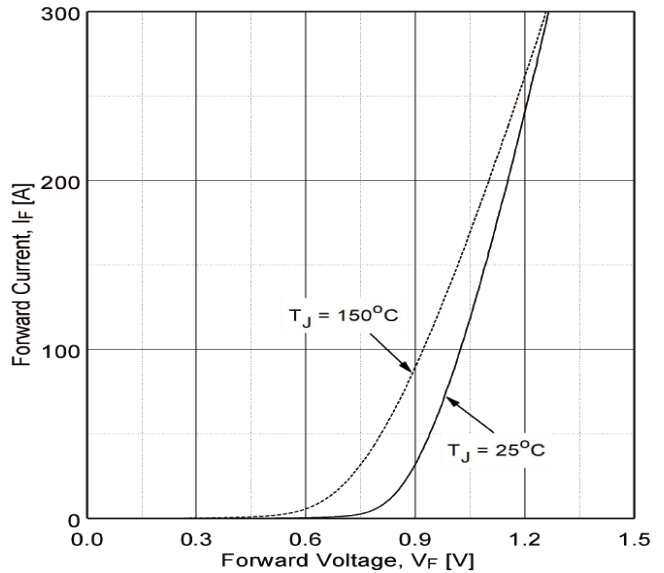


Fig 12, Forward Characteristics of Diode, Rectifier (typical)

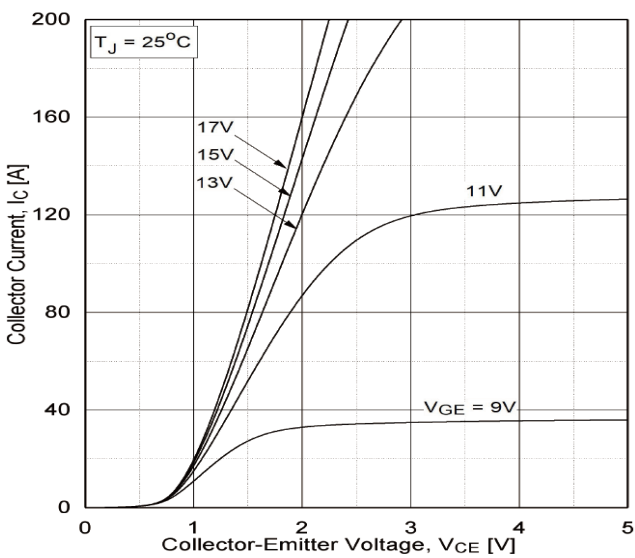


Fig 13, Output Characteristics IGBT, Brake (typical)

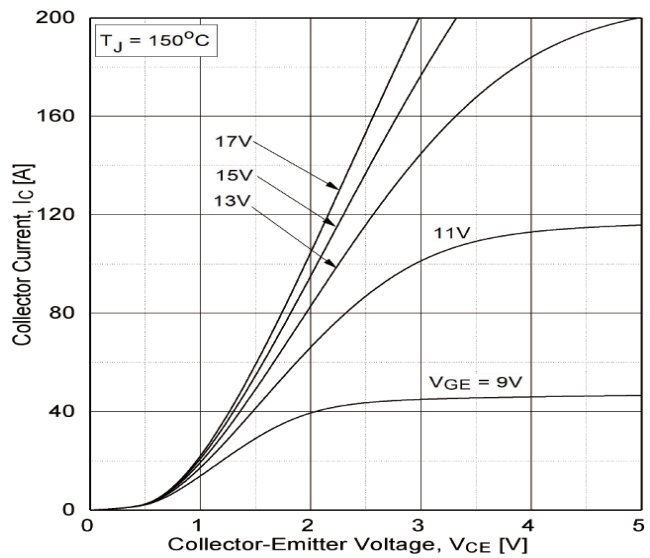


Fig 14, Output Characteristics IGBT, Brake (typical)

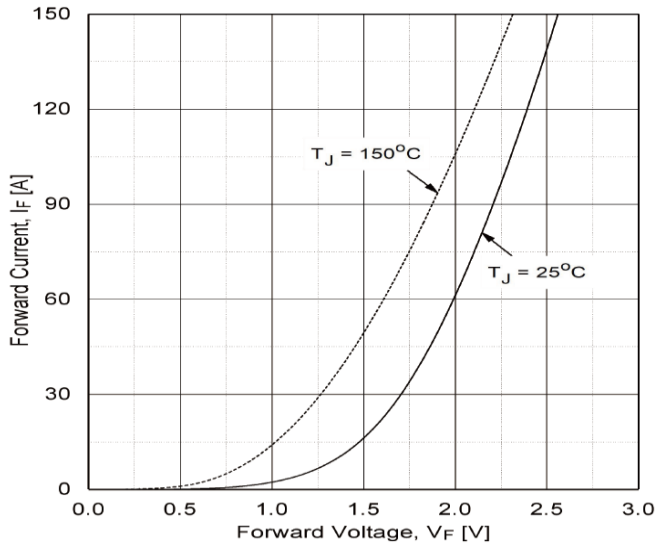


Fig 15, Forward Characteristics of Diode, Brake (typical)

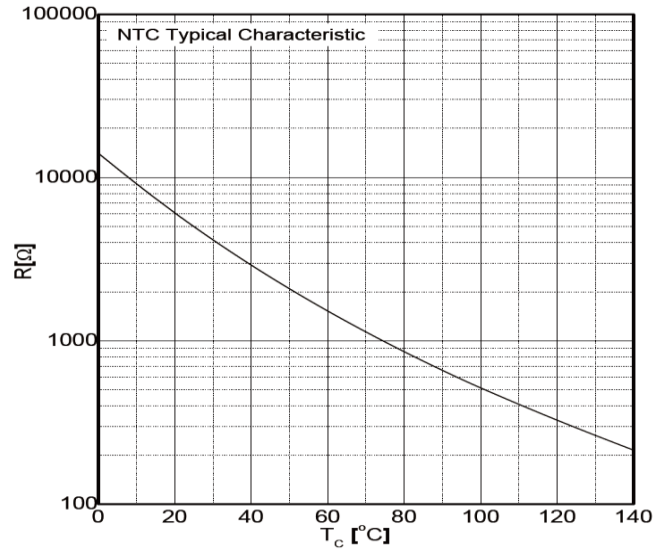
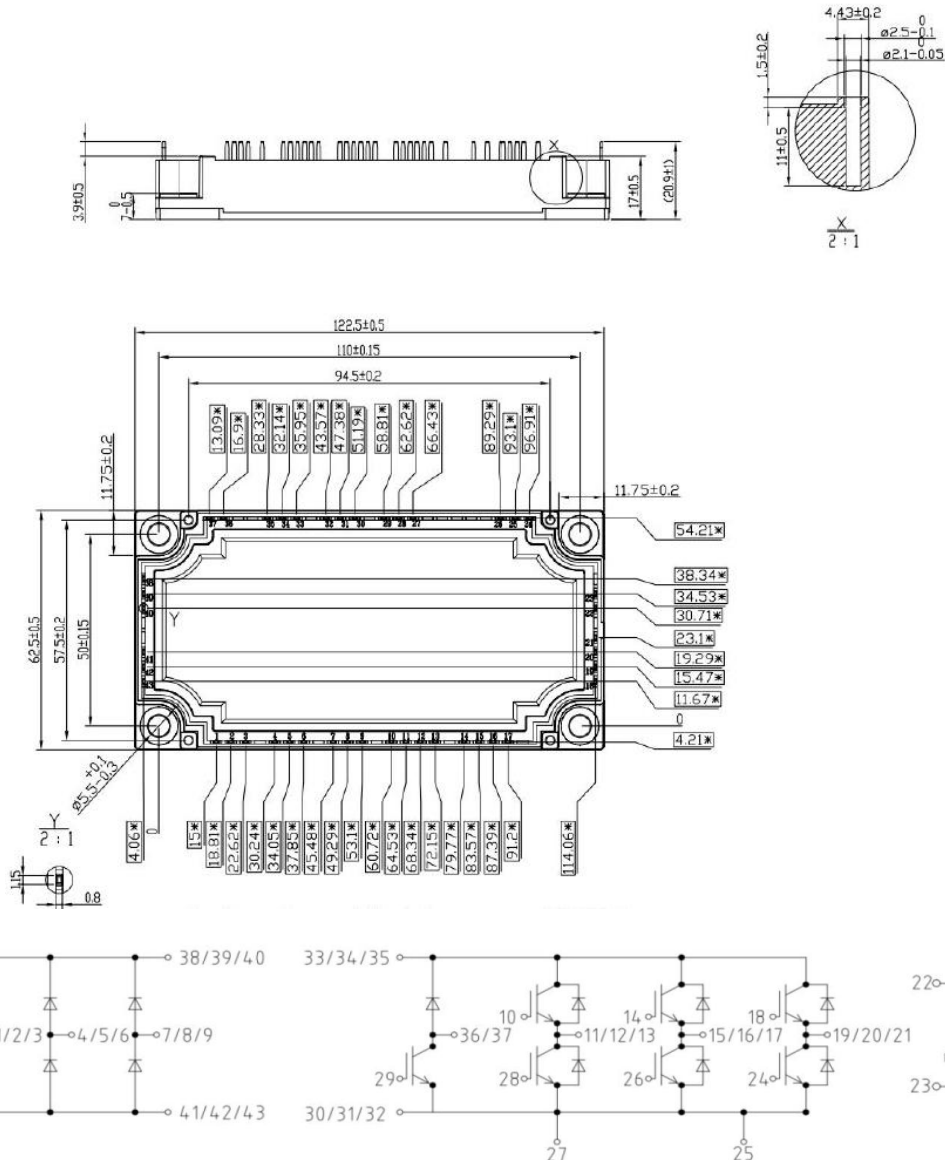


Fig 16, NTC Characteristics (typical)

Outline:



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

NIPS reserves the right to change specifications without notice.