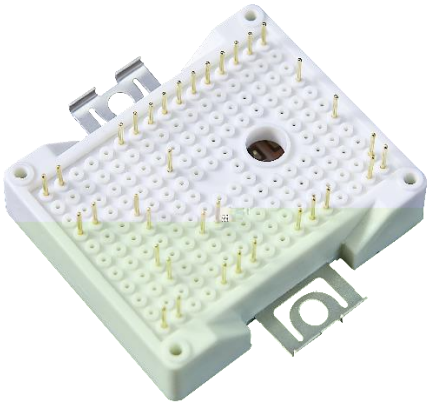
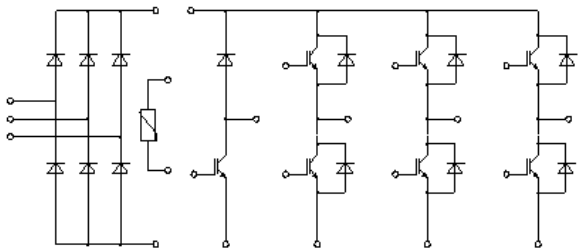
MG25P12P3



1200V
25A

Motor Drivers
AC and DC servo drive amplifier
UPS (Uninterruptible Power Supplies)

Circuit



Low switching losses
Low $v_{ce(sat)}$ with positive temperature coefficient
Including fast & soft recovery anti-parallel FWD
Low inductance case
High short circuit capability(10us)
Isolated heatsink using DBC technology
Maximum junction temperature 175

Collector-Emitter Voltage	V_{CES}	V_{GE}=0V, I_C =1mA, T_{vj}=25	1200	V
Continuous Collector Current	I_C	T_c=100 $_{vjmax}$ 175	25	A
Repetitive Peak Collector Current	I_{CRM}	tp=1ms	50	A
Gate-Emitter Voltage	V_{GES}	T_{vj}=25	20	V
Total Power Dissipation	P_{tot}	T_c=25 T_{vjmax}=175	175	W

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Gate-emitter Threshold Voltage	$V_{GE(th)}$	V_{GE}=V_{CE}, I_C =1.2mA,T_{vj}=25	5.2	5.8	6.4	V
Collector-Emitter Cut-off Current	I_{CES}	V_{CE}=1200V,V_{GE}=0V, T_{vj}=25			1.0	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	Ic=25A,V_{GE}=15V, T_{vj}=25		1.85	2.25	V
		Ic=25A,V_{GE}=15V, T_{vj}=125		2.15		
		Ic=25A,V_{GE}=15V, T_{vj}=150		2.25		
Gate Charge	Q_G			0.20		uC
Input Capacitance	C_{ies}	V_{CE}=25V,V_{GE} =0V, f=1MHz, T_{vj}=25		1.90		nF
Reverse Transfer Capacitance	C_{res}			0.10		nF
Gate-Emitter leakage current	I_{GES}	V_{CE}=0 V, V_{GE}=20 V,T_{vj} = 25			400	nA
Turn-on Delay Time	$t_{d(on)}$	I_C =25 A V_{CE} = 600 V V_{GE} = ±15V R_G = 20Ω T_{vj}=25		26		ns
Rise Time	t_r			17		ns
Turn-off Delay Time	$t_{d(off)}$			194		ns
Fall Time	t_f			181		ns
Energy Dissipation During Turn-on Time	E_{on}			1.62		mJ
Energy Dissipation During Turn-off Time	E_{off}			1.44		mJ
Turn-on Delay Time	$t_{d(on)}$	I_C =25 A V_{CE} = 600 V V_{GE} = ±15V R_G = 20Ω T_{vj}=125		28		ns
Rise Time	t_r			21		ns
Turn-off Delay Time	$t_{d(off)}$			284		ns
Fall Time	t_f			212		ns
Energy Dissipation During Turn-on Time	E_{on}			2.4		mJ
Energy Dissipation During Turn-off Time	E_{off}			2.18		mJ
SC Data	I_{sc}	T_p≤10us,V_{GE}=15V,T_{vj}=150 , V_{cc}=900V,V_{CEM}≤1200V		120		A

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Repetitive Peak Reverse Voltage	V_{RRM}	Tv_j=25	1200	V
Continuous DC Forward Current	I_F		25	A
Repetitive Peak Forward Current	I_{FRM}	tp=1ms	50	A
I^2t-value	I^2t	V_R=0,t_p=10ms,Tv_j=125	90.0	A^2s
		V_R=0,t_p=10ms,Tv_j=150	75.0	

Forward Voltage	V_F	I_F=25A,T_{vj}=25		2.10	2.50	V
		I_F=25A,T_{vj}=125		2.20		
		I_F=25A,T_{vj}=150		2.20		
Recovered Charge	Q_{rr}	I_F =25 A V_R=600V -di_F/dt =1700A/us T_{vj}=25		2.52		uC
Peak Reverse Recovery Current	I_{rr}			28.5		A
Reverse Recovery Energy	E_{rec}			0.94		mJ
Recovered Charge	Q_{rr}	I_F =25 A V_R=600V -di_F/dt =1700A/us T_{vj}=125		50.8		uC
Peak Reverse Recovery Current	I_{rr}			30.5		A
Reverse Recovery Energy	E_{rec}			1.75		mJ

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Collector-Emitter Voltage	V_{CES}	V_{GE}=0V, I_C =1mA, T_{vj}=25	1200	V
Continuous Collector Current	I_C	T_c=100 , vjmax 175	25	A
Repetitive Peak Collector Current	I_{CRM}	tp=1ms	50	A
Gate-Emitter Voltage	V_{GES}	T_{vj}=25	20	V
Total Power Dissipation	P_{tot}	T_c=25 ,T_{vjmax}=175	175	W

Gate-emitter Threshold Voltage	$V_{GE(th)}$	V_{GE}=V_{CE}, I_C =1.2mA,T_{vj}=25	5.2	5.8	6.4	V
Collector-Emitter Cut-off Current	I_{CES}	V_{CE}=1200V,V_{GE}=0V, T_{vj}=25			1.0	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	Ic=25A,V_{GE}=15V, T_{vj}=25		1.85	2.25	V
		Ic=25A,V_{GE}=15V, T_{vj}=125		2.15		
		Ic=25A,V_{GE}=15V, T_{vj}=150		2.25		
Gate Charge	Q_G			0.20		uC
Input Capacitance	C_{ies}	V_{CE}=25V,V_{GE} =0V, f=1MHz, T_{vj}=25		1.90		nF
Reverse Transfer Capacitance	C_{res}			0.10		nF
Gate-Emitter leakage current	I_{GES}	V_{CE}=0 V, V_{GE}=20 V,T_{vj} = 25			400	nA
Turn-on Delay Time	$t_{d(on)}$	I_C =25 A V_{CE} = 600 V V_{GE} = ±15V R_G = 20Ω T_{vj}=25		26		ns
Rise Time	t_r			17		ns
Turn-off Delay Time	$t_{d(off)}$			194		ns
Fall Time	t_f			181		ns
Energy Dissipation During Turn-on Time	E_{on}			1.62		mJ
Energy Dissipation During Turn-off Time	E_{off}			1.44		mJ

Turn-on Delay Time	$t_{d(on)}$	I_C =25 A V_{CE} = 600 V V_{GE} = ±15V R_G = 20Ω T_{vj}=125		28		ns
Rise Time	t_r			21		ns
Turn-off Delay Time	$t_{d(off)}$			284		ns
Fall Time	t_f			212		ns
Energy Dissipation During Turn-on Time	E_{on}			2.4		mJ
Energy Dissipation During Turn-off Time	E_{off}			2.18		mJ
SC Data	I_{sc}	T_p≤10us,V_{GE}=15V,T_{vj}=150 , V_{cc}=900V,V_{CEM}≤1200V		120		A

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Repetitive Peak Reverse Voltage	V_{RRM}	T_{vj}=25	1200		V
Continuous DC Forward Current	I_F		15		A
Repetitive Peak Forward Current	I_{FRM}	t_p=1ms	30		A
I²t-value	I²t	V_R=0,t_p=10ms,T_{vj}=125	16.0		A²s
		V_R=0,t_p=10ms,T_{vj}=150	14.0		

Forward Voltage	V_F	I_F=15A,T_{vj}=25		2.00	2.65	V
		I_F=15A,T_{vj}=125		2.10		
		I_F=15A,T_{vj}=150		2.10		
Recovered Charge	Q_{rr}	I_F =15A V_R=600V -di_F/dt =600A/us T_{vj}=25		1.20		uC
Peak Reverse Recovery Current	I_{rr}			13.0		A
Reverse Recovery Energy	E_{rec}			0.37		mJ
Recovered Charge	Q_{rr}	I_F =15 A V_R=600V -di_F/dt =600A/us T_{vj}=125		2.05		uC
Peak Reverse Recovery Current	I_{rr}			12.0		A
Reverse Recovery Energy	E_{rec}			0.68		mJ

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Repetitive Peak Reverse Voltage	V_{RRM}	T_j=25	1600	V
Average output Current 50/60Hz, sine wave	$I_{F(AV)}$	T_c=100	35	A
Maximum RMS Current at Rectifier Output	I_{RMSM}	T_c=100	60	A
Surge Forward Current	I_{FSM}	V_R=0,t_p=10ms,T_j=45	320	A
I^2t-value	I^2t	V_R=0,t_p=10ms,T_j=45	510	A^2s

Diode Forward Voltage	V_F	I_F=10A,T_j=150		1.02		V
Reverse Current	I_R	T_j=150 ,V_R=1600V			2	mA

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Rated Resistance	R_{25}			5.0		k 6
Deviation of R100	R/R	T_C=100,R_{100}=493.3 6	-5		5	%
Power Dissipation	P_{25}				20.0	mW
B-value	$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15\ K))]$		3375		K

●

Isolation voltage	V_{isol}	t=1min,f=50Hz	2500			V
Maximum Junction Temperature	T_{jmax}				175	
Operating Junction Temperature	$T_{vj\ op}$		-40		150	
Storage Temperature	T_{stg}		-40		125	
Stray-inductance-module	L_{SCE}			30		
Module lead resistance, terminals-chip	$R_{cc'+EE'}$	T_C=25 , per switch		5.00		6
	$R_{AA'+CC'}$			6.00		
Thermal Resistance Junction-to Case	R_{JC}	per IGBT-inverter		0.75	0.85	K/W
		per Diode-inverter		1.10	1.20	

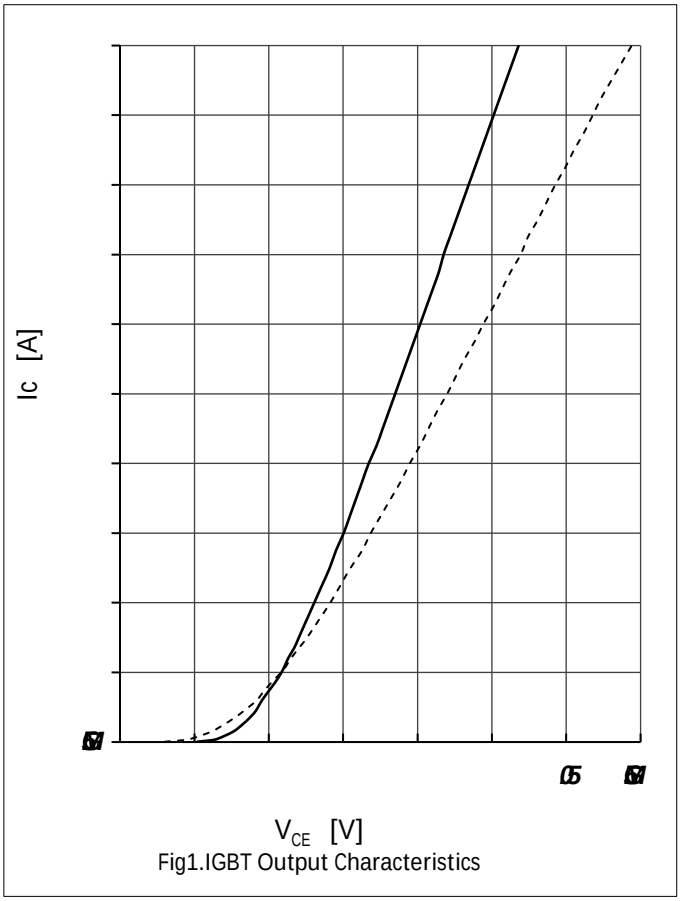
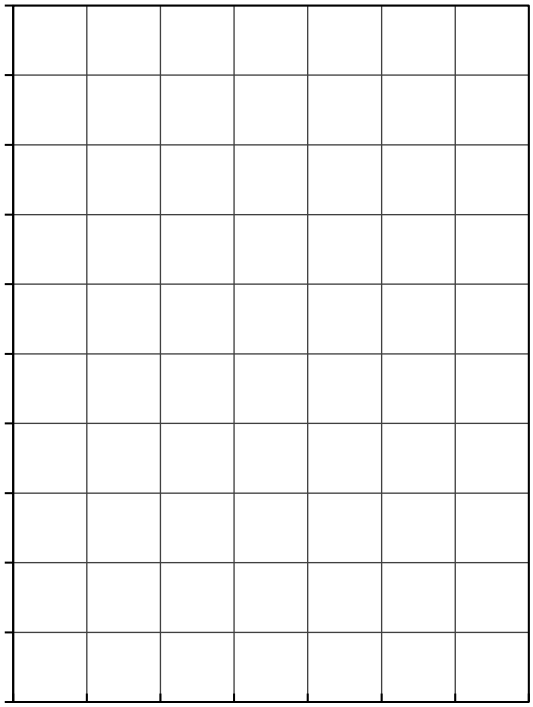


Fig1.IGBT Output Characteristics



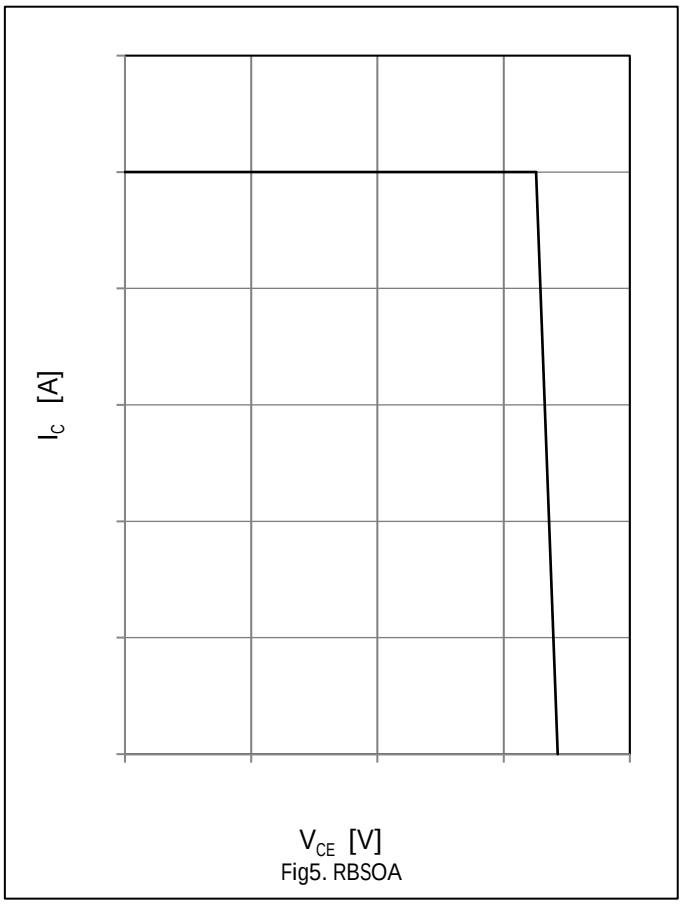
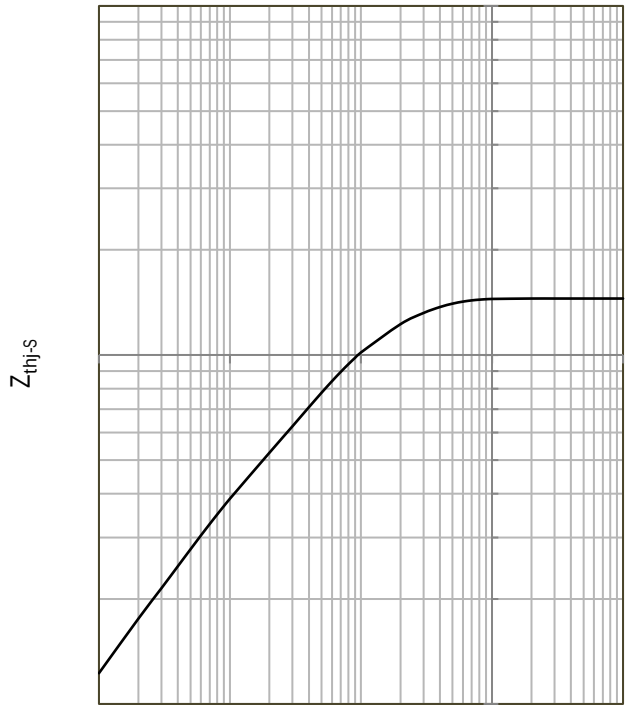


Fig5. RBSOA



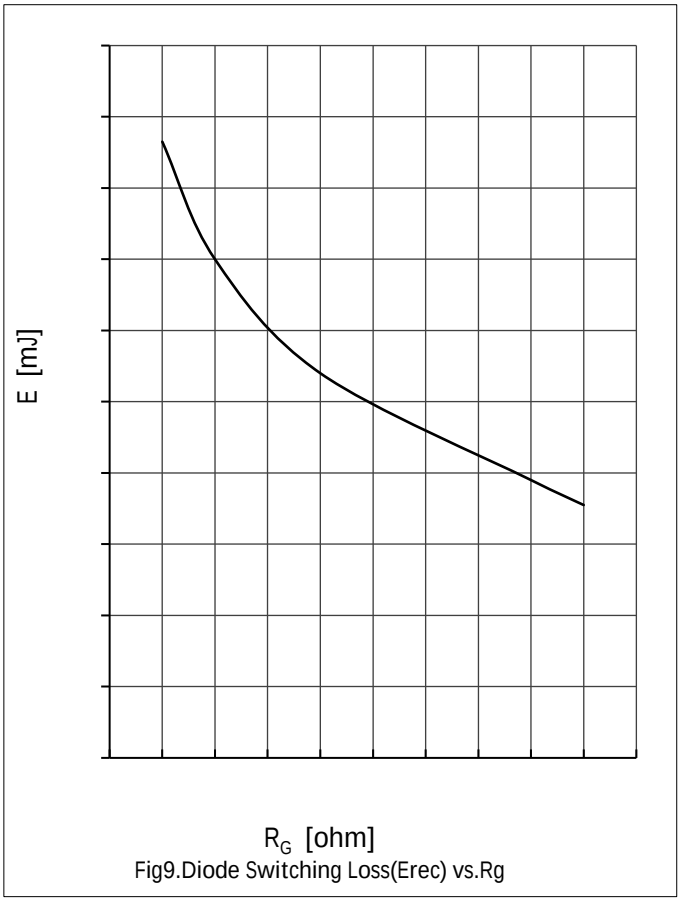


Fig9.Diode Switching Loss(Erec) vs.Rg

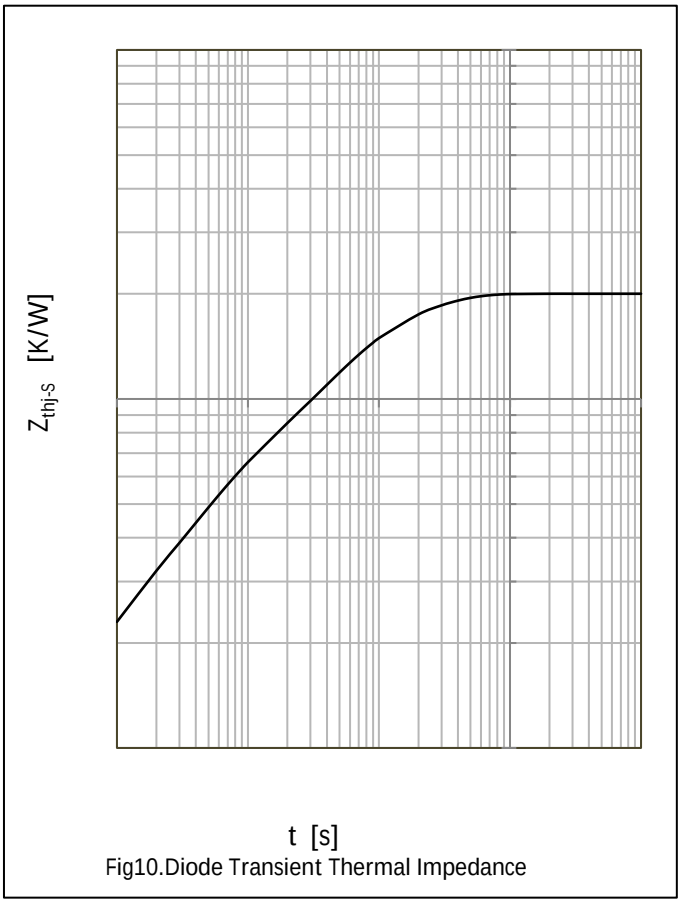


Fig10.Diode Transient Thermal Impedance

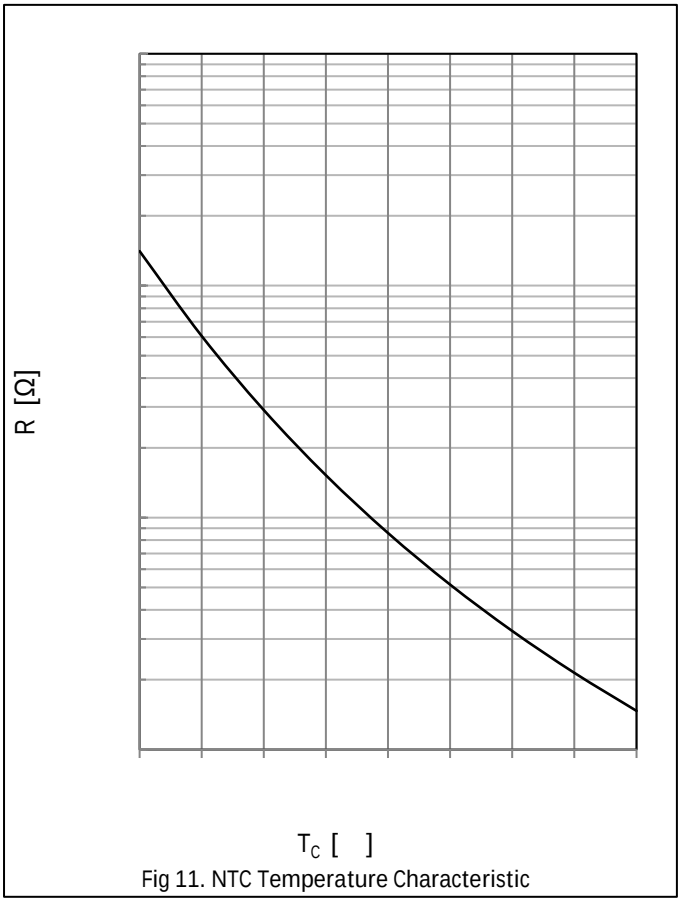
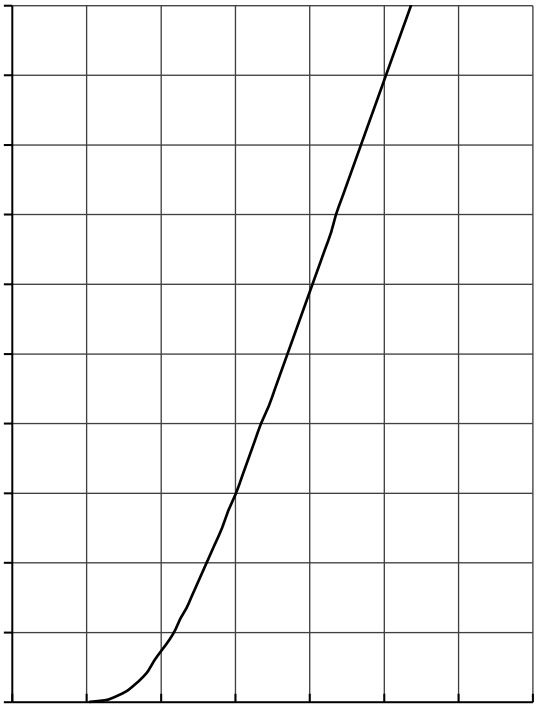


Fig 11. NTC Temperature Characteristic



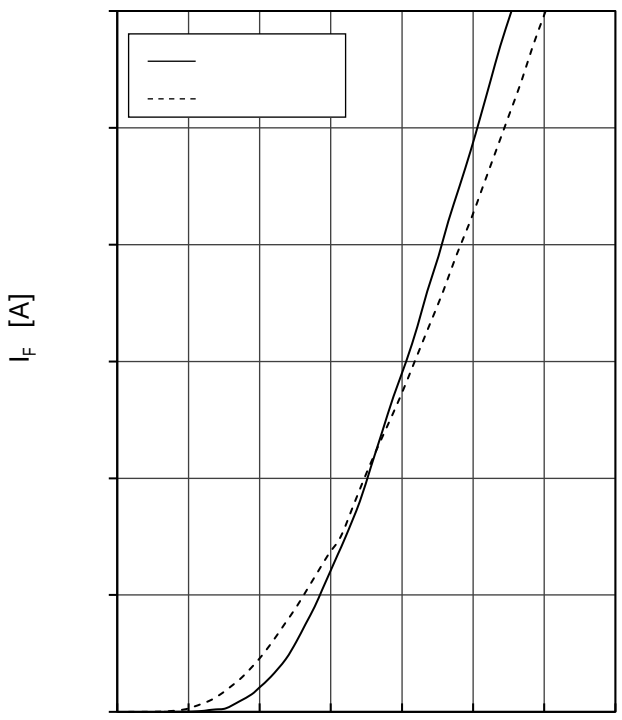
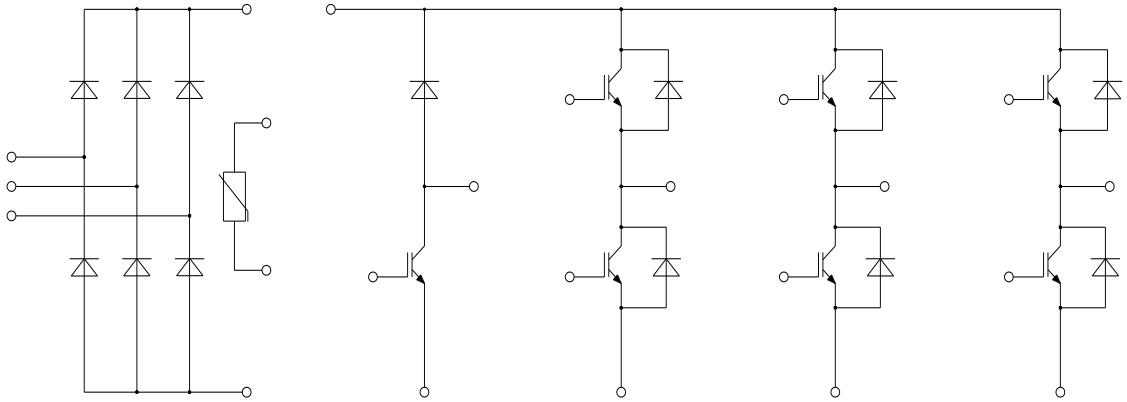
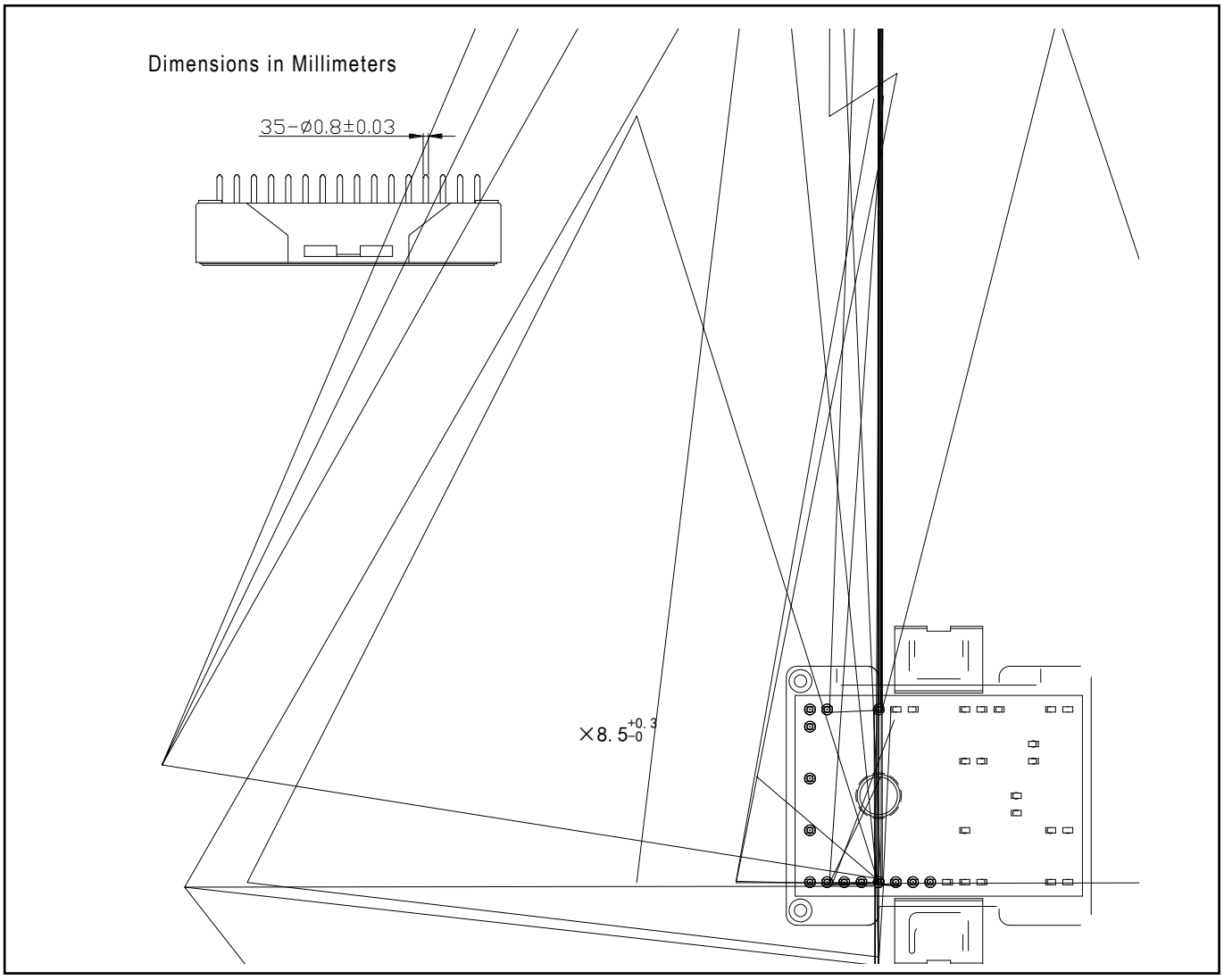


Fig13. Diode-brake-chopper Forward Characteristics




Dimensions in Millimeters
35−ø0.8±0.03
×8.5+0.3 −0