

7MBR100VJC120-53

IGBT Modules

Power Module (V series)
1200V / 100A / PIM

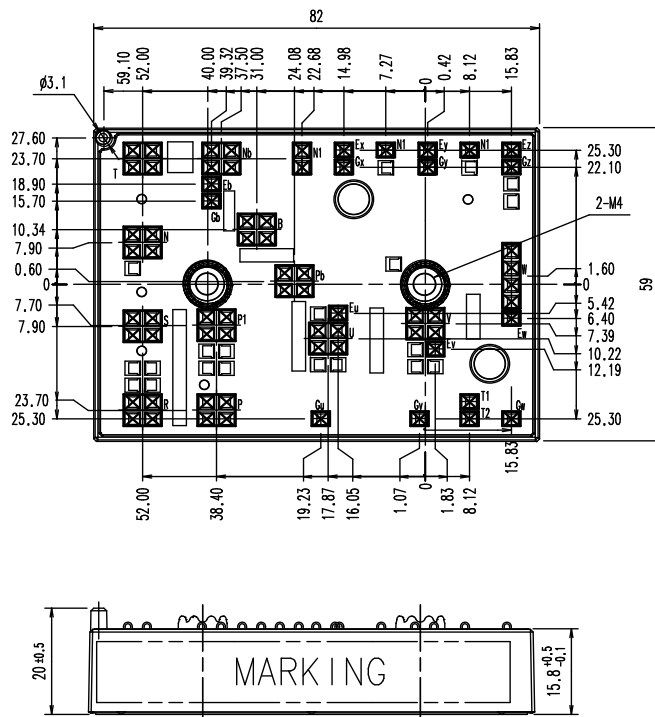
■ Features

LOW $V_{CE(sat)}$
Compact Package
P.C.Board Mount Module
Converter Diode Bridge Dynamic Brake Circuit
RoHS compliant product

■ Applications

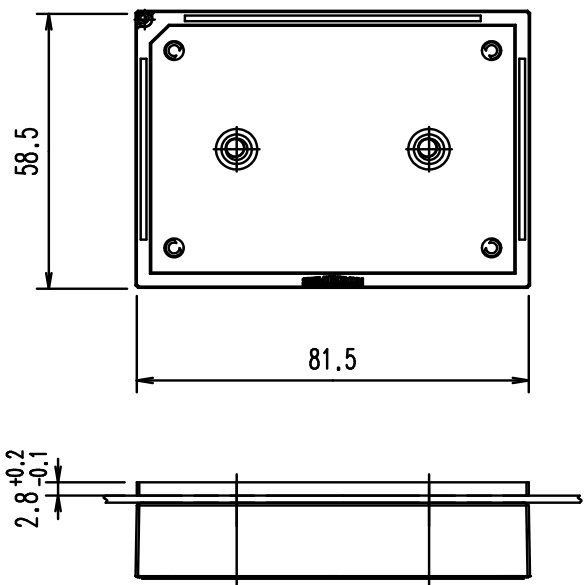
Inverter for Motor Drives
AC and DC Servo Drive Amplifier
Uninterruptible Power Supply

■ Outline drawing (Unit : mm)



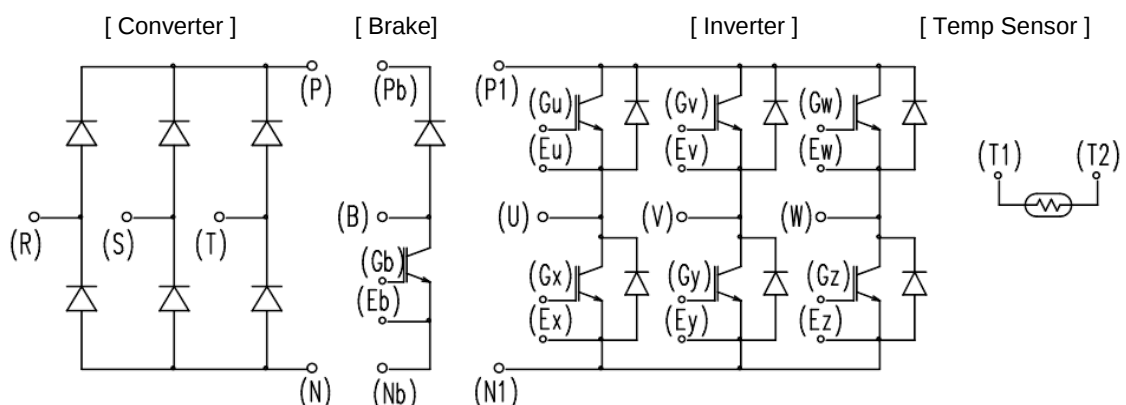
単位 / Unit : mm
公差 / tolerance : ISO 2768-f

SLIM LID USE



Weight: 95g (typ.)

■ Equivalent Circuit



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■ Absolute Maximum ratings (at Tc= 25°C unless otherwise specified)

Items		Symbols	Conditions		Maximum ratings	Units
Inverter	Collector-Emitter voltage	V _{CES}			1200	V
	Gate-Emitter voltage	V _{GES}			±20	V
	Collector current	I _c	Continuous	T _c =100°C	100	A
		I _{cp}	1ms	T _c =80°C	200	
		-I _c			100	
		-I _c pulse	1ms			
Brake	Collector-Emitter voltage	V _{CES}			1200	V
	Gate-Emitter voltage	V _{GES}			±20	V
	Collector current	I _c	Continuous	T _c =80°C	100	A
		I _{CP}	1ms	T _c =80°C	200	
	Repetitive peak reverse voltage (Diode)	V _{RRM}			1200	V
Converter	Repetitive peak reverse voltage	V _{RRM}			1600	V
	Average output current	I _O	50Hz/60Hz, sine wave		100	A
	Surge current (Non-Repetitive)	I _{FSM}	10ms, T _j =150°C		890	A
	I ² t (Non-Repetitive)	I ² t	half sine wave		3900	A ² s
	Surge current (Non-Repetitive)	I _{FSM}	10ms, T _j =25°C		1000	A
	I ² t (Non-Repetitive)	I ² t	half sine wave		5000	A ² s
	Junction temperature		T _j	Inverter, Brake	175	°C
		Converter		150		
Operating junciton temperature (under switching conditions)		T _{jop}	Inverter, Brake	150		
			Converter	150		
Case temperature		T _c			125	
Storage temperature		T _{stg}			-40~+125	
Isolation voltage	between terminal and DCB Backside (*1) between temperature sensor and others (*2)	V _{iso}	AC : 1min.		2500	VAC
Screw torque	Mounting (*3)	-	M4		2.5	N m

(*1) All terminals should be connected together during the test.

(*2) Two temp sensor terminals should be connected together, other terminals should be connected together and shorted to DCB Backside during the test.

(*3) Recommendable value : 2.0-2.5 Nm (M4)

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■ Electrical characteristics (at Tj= 25°C unless otherwise specified)

Items		Symbols	Conditions		Characteristics			Units
					min.	typ.	max.	
Inverter	Zero gate voltage collector current	I _{CES}	V _{GE} = 0V V _{CE} = 1200V		-	-	1.0	mA
	Gate-Emitter leakage current	I _{GES}	V _{CE} = 0V V _{GE} = ±20V		-	-	200	nA
	Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} = 20V I _C = 100mA		6.0	6.5	7.0	V
	Collector-Emitter saturation voltage	V _{CE(sat)} (terminal)	V _{GE} = 15V I _C = 100A	Tj= 25°C	-	2.10	2.55	V
				Tj=125°C	-	2.40	-	
				Tj=150°C	-	2.45	-	
		V _{CE(sat)} (chip)	V _{GE} = 15V I _C = 100A	Tj= 25°C	-	1.75	2.20	
				Tj=125°C	-	2.05	-	
				Tj=150°C	-	2.10	-	
	Collector power disipation	P _c	1 device		-	315	-	W
	Internal gate resistance	R _{g(int)}	-		-	7.5	-	Ω
	Input capacitance	C _{ies}	V _{CE} =10V,V _{GE} =0V,f=1MHz		-	9.1	-	nF
	Turn-on time	ton	V _{CC} = 600V I _C = 100A		-	0.42	1.20	μs
		tr			-	0.11	0.60	
		tr (i)	V _{GE} = ±15V R _G = 1 Ω		-	0.04	-	
	Turn-off time	toff			-	0.44	1.00	μs
		tf			-	0.06	0.30	
Forward on voltage	V _F (terminal)	I _F = 100A	Tj= 25°C	-	2.20	2.65	V	
			Tj=125°C	-	2.45	-		
			Tj=150°C	-	2.40	-		
	V _F (chip)	I _F = 100A	Tj= 25°C	-	1.85	2.30		
			Tj=125°C	-	2.10	-		
			Tj=150°C	-	2.05	-		
Reverse recovery time	trr	I _F = 100A		-	-	0.35	μs	
Brake	Zero gate voltage collector current	I _{CES}	V _{GE} = 0V V _{CE} = 1200V		-	-	1.0	mA
	Gate-Emitter leakage current	I _{GES}	V _{CE} = 0V V _{GE} = ±20V		-	-	200	nA
	Collector-Emitter saturation voltage	V _{CE(sat)} (terminal)	V _{GE} = 15V I _C = 100A	Tj= 25°C	-	2.10	2.55	V
				Tj=125°C	-	2.40	-	
				Tj=150°C	-	2.45	-	
		V _{CE(sat)} (chip)	V _{GE} = 15V I _C = 100A	Tj= 25°C	-	1.75	2.20	
	Tj=125°C			-	2.05	-		
	Tj=150°C			-	2.10	-		
	Collector power disipation	P _c	1 device		-	315	-	W
	Internal gate resistance	R _{g(int)}	-		-	7.5	-	Ω
	Turn-on time	ton	V _{CE} = 600V I _C = 100A		-	0.42	1.20	μs
		tr			-	0.11	0.60	
	Turn-off time	toff	V _{GE} = ±15V R _G = 1 Ω		-	0.44	1.00	μs
		tf			-	0.06	0.30	
Converter	Reverse current	I _{RRM}	V _R = 1200V		-	-	1.0	mA
	Forward on voltage	V _{FM}	I _F = 100A	terminal	-	1.50	-	V
				chip	-	1.15	-	
Temperature Sensor	Reverse current	I _{RRM}	V _R = 1600V		-	-	1.0	mA
					-	-	1.0	Ω
Temperature Sensor	R	T = 25°C	Im=1mA		-	1000	-	Ω
		T = 100°C	Im=1mA		-	1670	-	

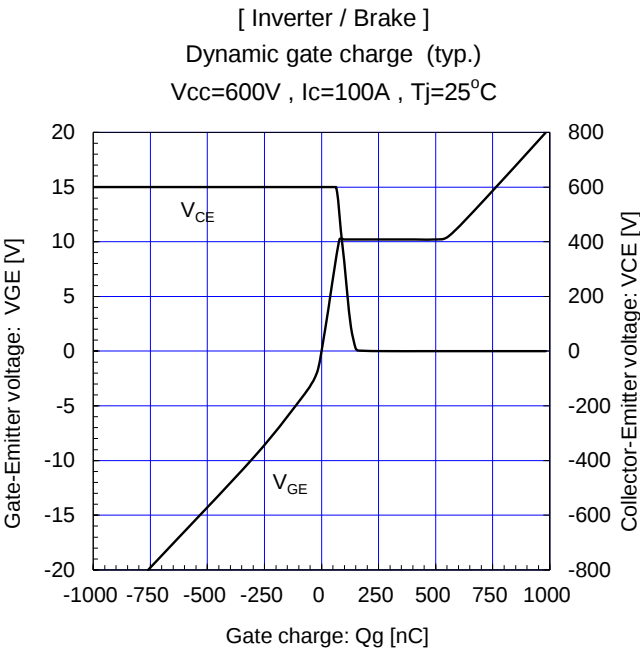
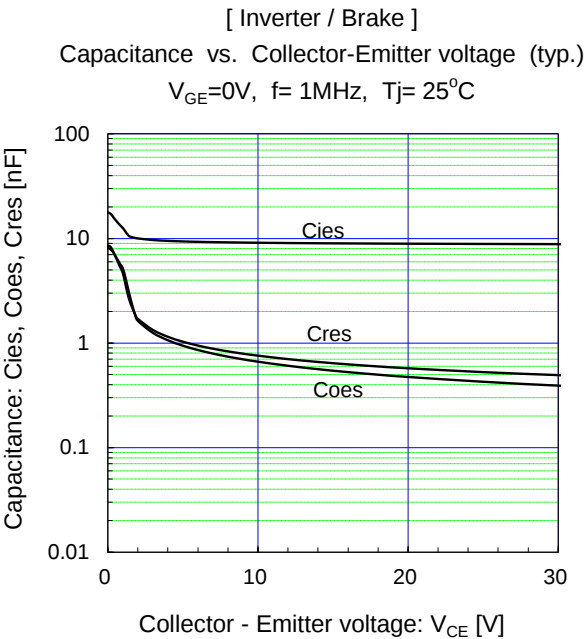
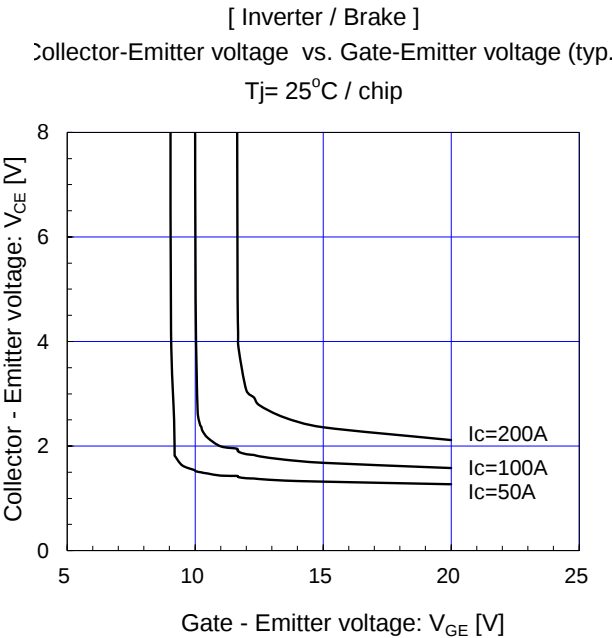
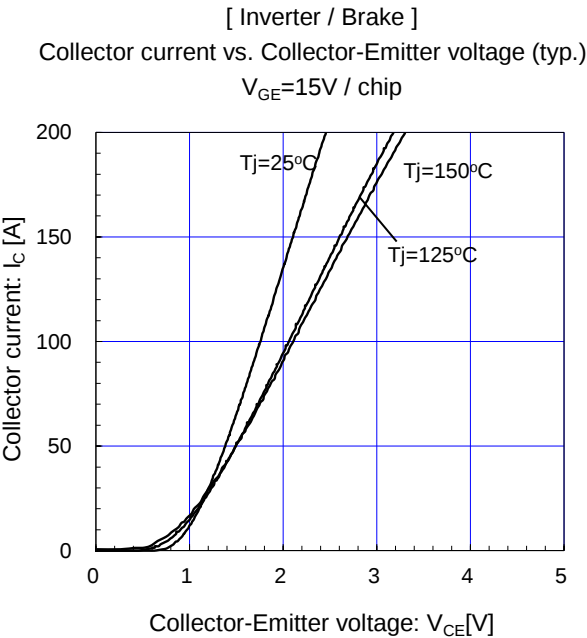
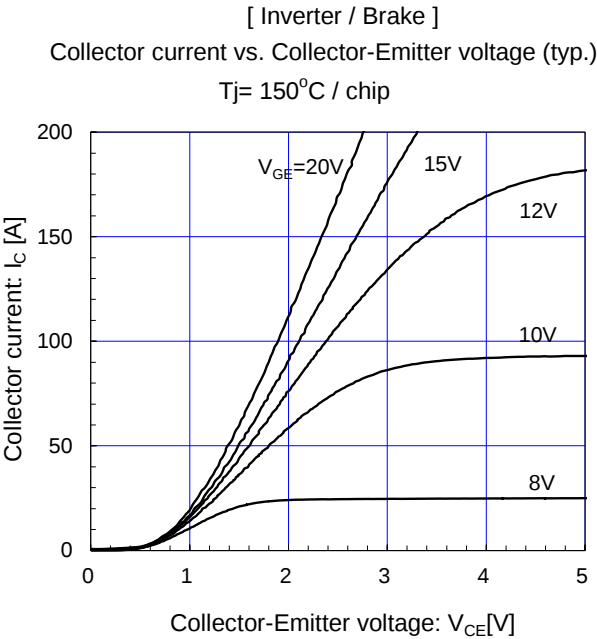
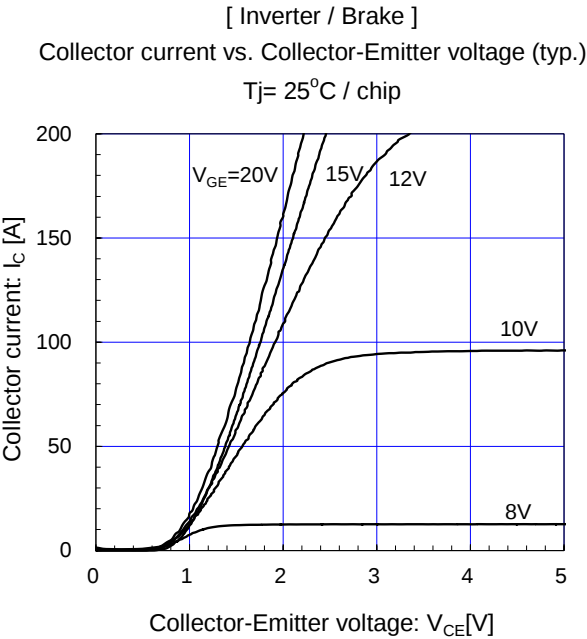
■ Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance(1device)	Rth(j-c)	Inverter / Brake IGBT	-	0.48	-	$^\circ C/W$
		Inverter FWD	-	0.66	-	
		Converter Diode	-	0.70	-	
Contact thermal resistance (1device) (*4)	Rth(c-f)	with Thermal Compound	-	0.05	-	

(*4) This is the value which is defined mounting on the additional cooling fin with thermal compound.

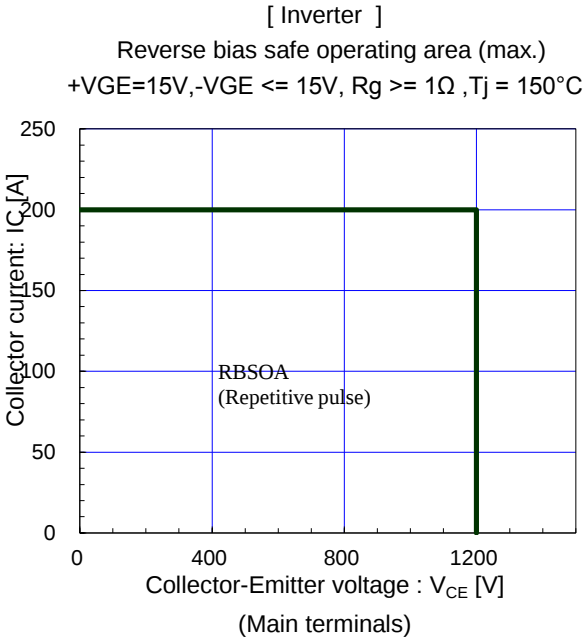
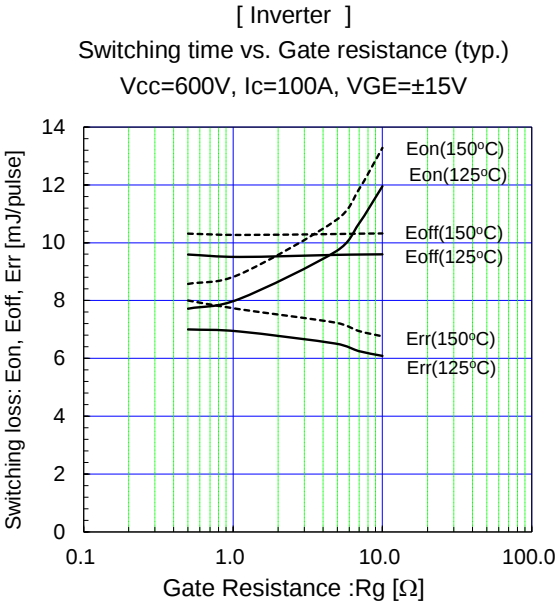
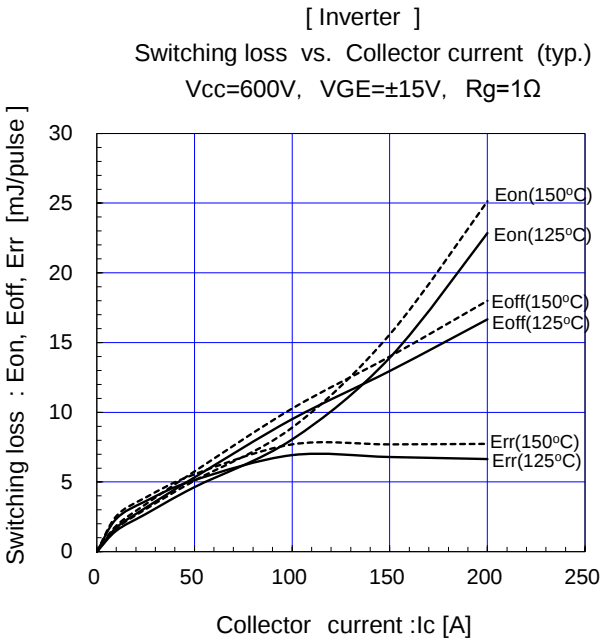
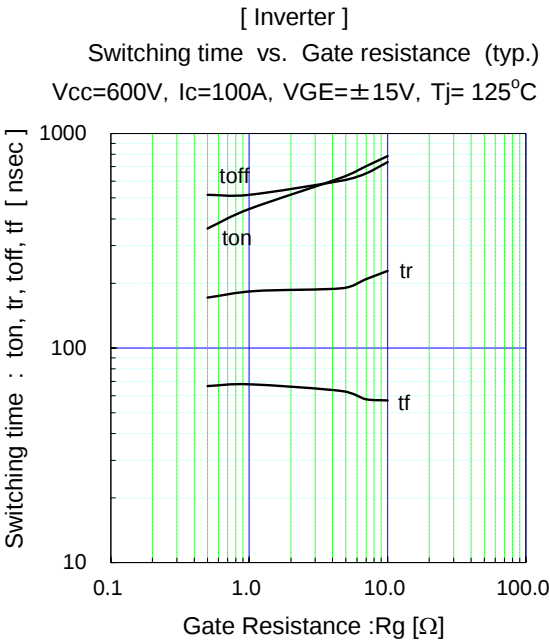
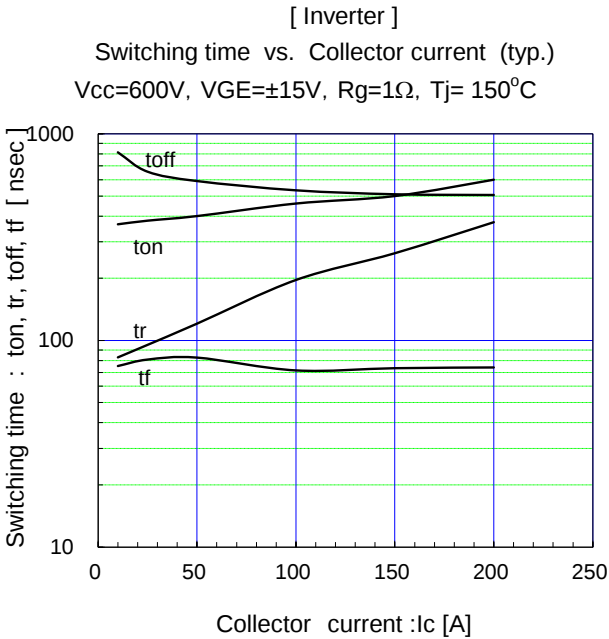
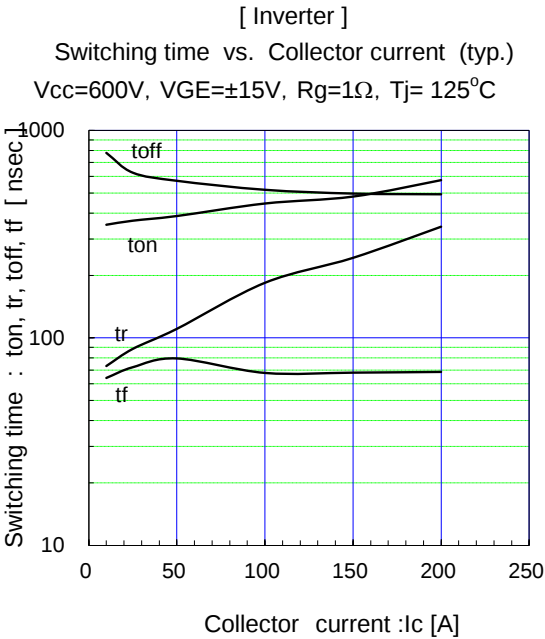
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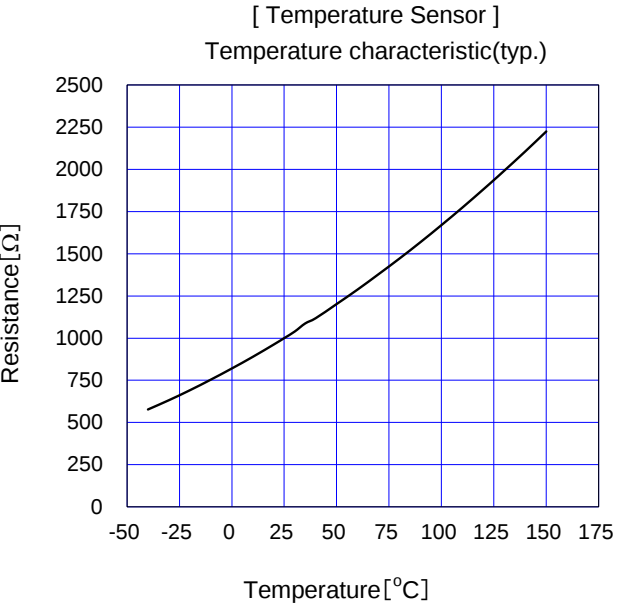
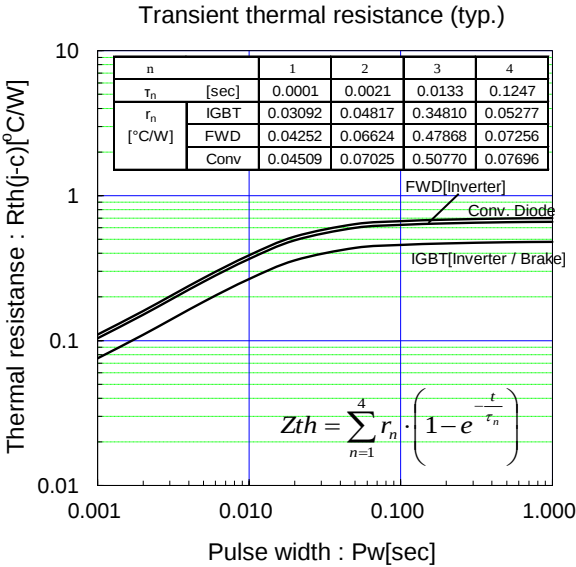
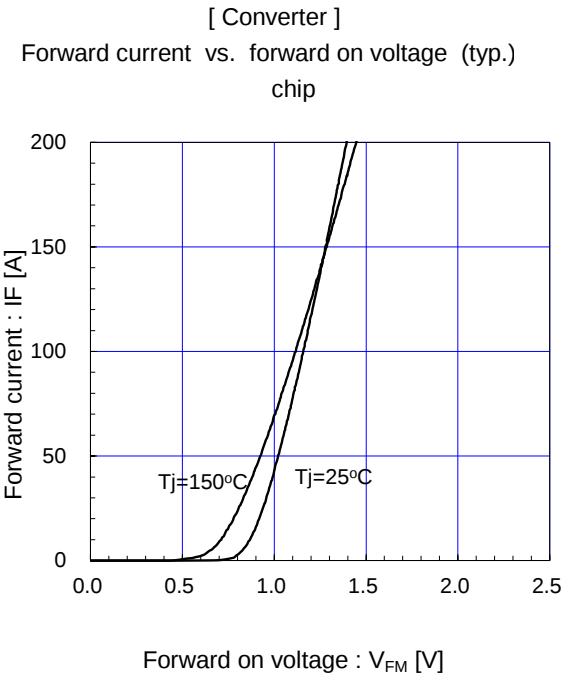
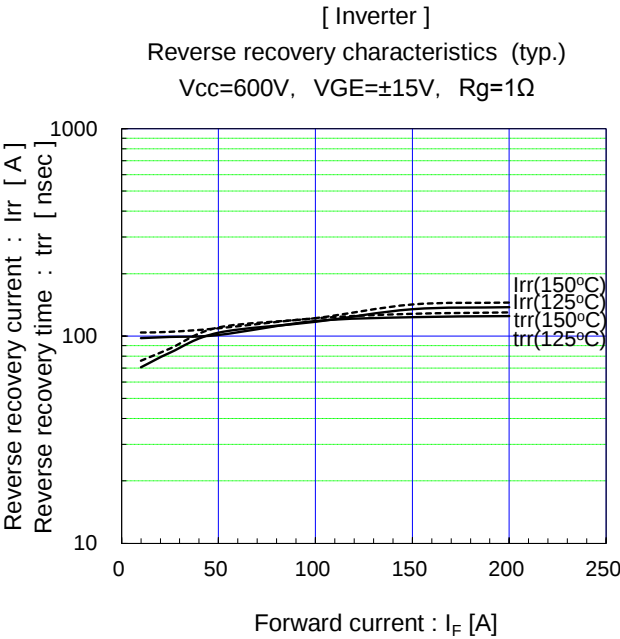
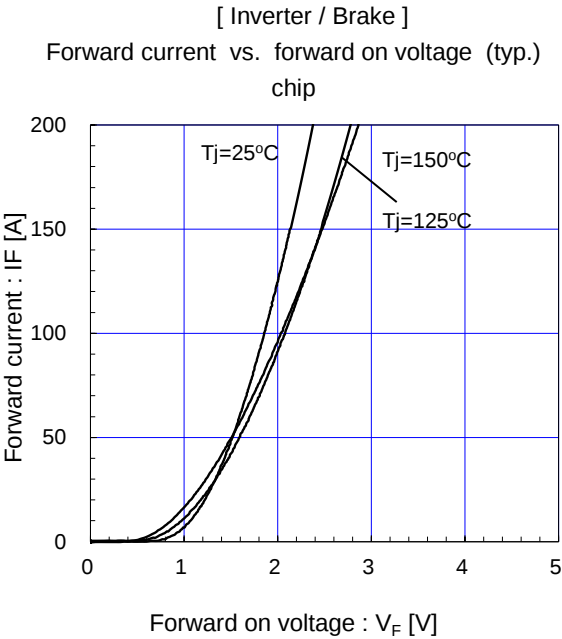
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