7MBR8VJA120-53

IGBT Modules

Power Module (V series)
1200V / 8A / PIM

■ Features

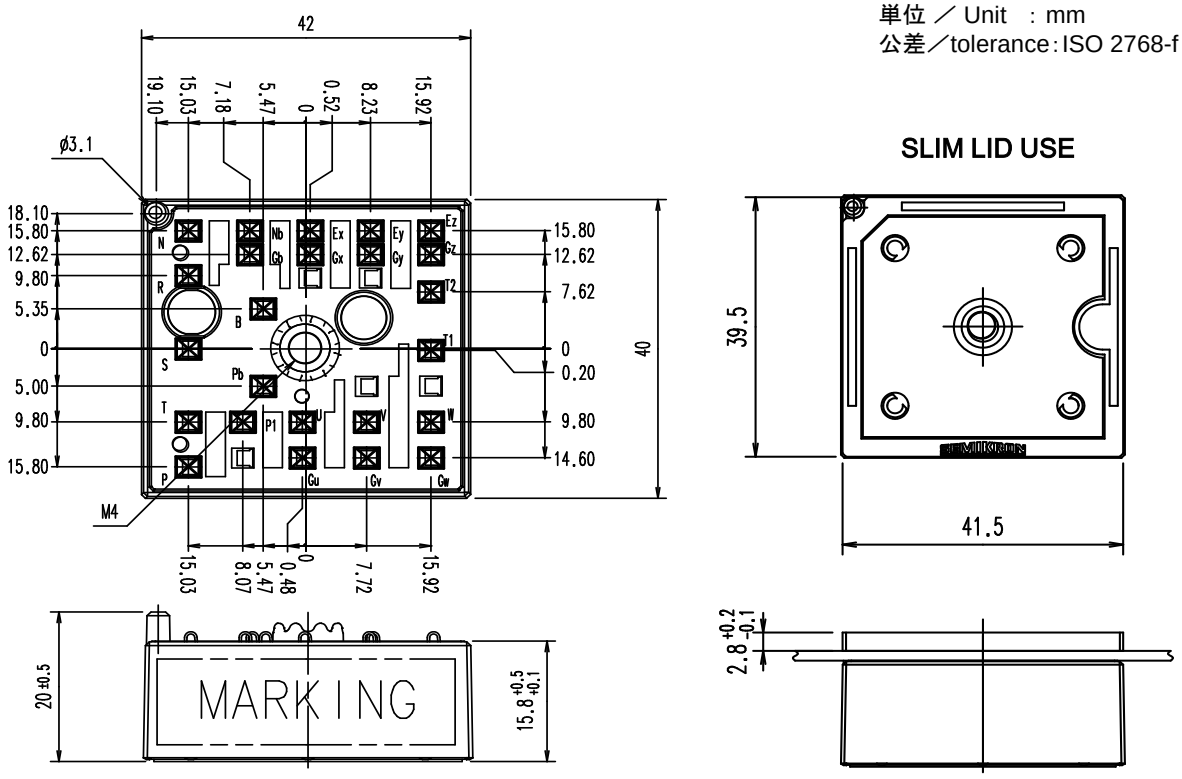
Low $V_{CE(sat)}$
Compact Package
P.C.Board Mount Module
Conveter Diode Bridge Dynamic Brake Circuit
RoHS compliant product

■ Applications

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

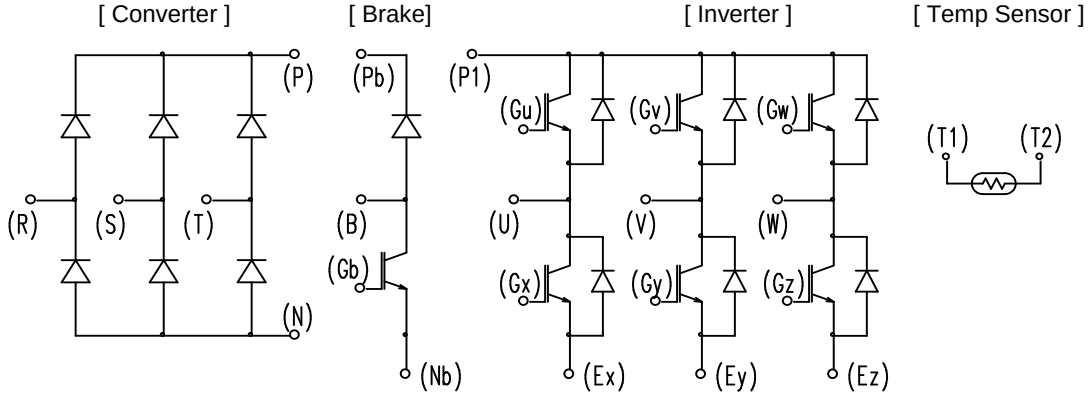
■ Outline drawing (Unit : mm)

単位 ／ Unit ：mm
公差／tolerance：ISO 2768-f



Weight: 40g (typ.)

■ Equivalent Circuit



FM6M1626
2015/08

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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		Ic	Continuous	Tc=100°C	8	A
			Icp	1ms	Tc=80°C	16	
			-Ic			8	
			-Ic pulse	1ms		16	
Brake	Collector-Emitter voltage		V_{CES}			1200	V
	Gate-Emitter voltage		V_{GES}			±20	V
	Collector current		I_C	Continuous	Tc=80°C	8	A
			I_{CP}	1ms	Tc=80°C	16	
	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		8	A
	Surge current	(Non-Repetitive)	I_{FSM}	10ms, Tj=150°C half sine wave		185	A
	I^2t	(Non-Repetitive)	I^2t			170	A^2s
	Surge current	(Non-Repetitive)	I_{FSM}	10ms, Tj=25°C half sine wave		220	A
	I^2t	(Non-Repetitive)	I^2t			240	A^2s
Junction temperature			Tj	Inverter, Brake		175	°C
				Converter		150	
Operating junciton temperature (under switching conditions)			Tjop	Inverter, Brake		150	
				Converter		150	
Case temperature			Tc			125	
Storage temperature			Tstg			-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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IGBT Modules

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

	Items	Symbols	Conditions		Characteristics min.	Characteristics typ.	Characteristics max.	Units
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 = 8mA		6.0	6.5	7.0	V
	Collector-Emitter saturation voltage	$V_{CE(sat)}$ (terminal)	V_{GE}= 15V I_C = 8A	Tj= 25°C	-	1.90	2.35	V
				Tj=125°C	-	2.25	-	
				Tj=150°C	-	2.30	-	
		$V_{CE(sat)}$ (chip)	V_{GE}= 15V I_C = 8A	Tj= 25°C	-	1.80	2.25	
				Tj=125°C	-	2.15	-	
				Tj=150°C	-	2.20	-	
	Collector power disipation	Pc	1 device		-	80	-	W
	Internal gate resistance	Rg(int)	-		-	0	-	Ω
	Input capacitance	Cies	V_{CE}=10V,V_{GE}=0V,f=1MHz		-	0.67	-	nF
	Turn-on time	ton	V_{CC} = 600V I_C = 8A V_{GE}= ±15V R_G = 47 Ω		-	0.16	1.20	μs
		tr			-	0.12	0.60	
		tr (i)			-	0.01	-	
	Turn-off time	toff			-	0.26	1.00	
		tf			-	0.09	0.30	
	Forward on voltage	V_F (terminal)	I_F = 8A	Tj= 25°C	-	1.55	2.00	V
				Tj=125°C	-	1.60	-	
				Tj=150°C	-	1.50	-	
		V_F (chip)	I_F = 8A	Tj= 25°C	-	1.45	1.90	
				Tj=125°C	-	1.50	-	
				Tj=150°C	-	1.40	-	
	Reverse recovery time	trr	I_F = 8A		-	-	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 = 8A	Tj= 25°C	-	1.90	2.35	V
				Tj=125°C	-	2.25	-	
				Tj=150°C	-	2.30	-	
		$V_{CE(sat)}$ (chip)	V_{GE}= 15V I_C = 8A	Ti= 25°C	-	1.80	2.25	
				Tj=125°C	-	2.15	-	
				Tj=150°C	-	2.20	-	
	Collector power disipation	Pc	1 device		-	80	-	W
	Internal gate resistance	Rg(int)	-		-	0	-	Ω
	Turn-on time	ton	V_{CE}= 600V I_C = 8A V_{GE}= +15/-15V R_G = 47 Ω		-	0.16	1.20	μs
		tr			-	0.12	0.60	
	Turn-off time	toff			-	0.26	1.00	
		tf			-	0.09	0.30	
	Reverse current	I_{RRM}	V_R= 1200V		-	-	1.00	mA
Converte	Forward on voltage	V_{FM}	I_F = 8A	terminal	-	1.10	-	V
				chip	-	1.00	-	
	Reverse current	I_{RRM}	V_R= 1600V		-	-	1.0	mA
Temperature Sensor		R	T = 25°C	Im=1mA	-	1000	-	Ω
			T = 100°C	Im=1mA	-	1670	-	

■ Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics min.	Characteristics typ.	Characteristics max.	Units
Thermal resistance(1device)	Rth(j-c)	Inverter / Brake IGBT	-	1.84	-	°C/W
		Inverter FWD	-	2.53	-	
		Converter Diode	-	1.50	-	
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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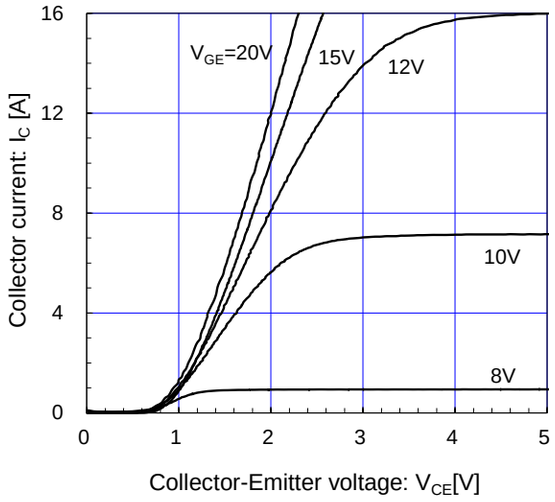
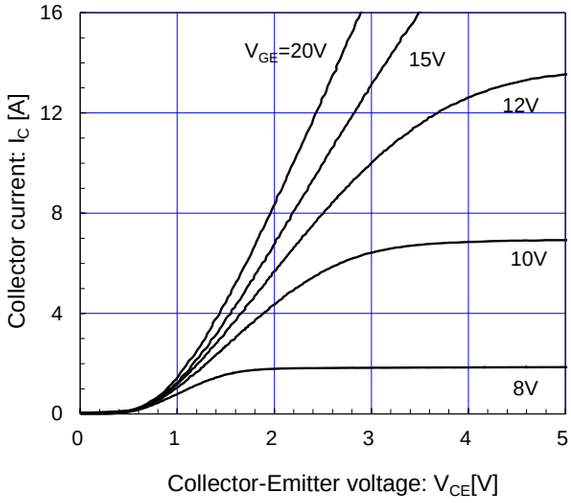
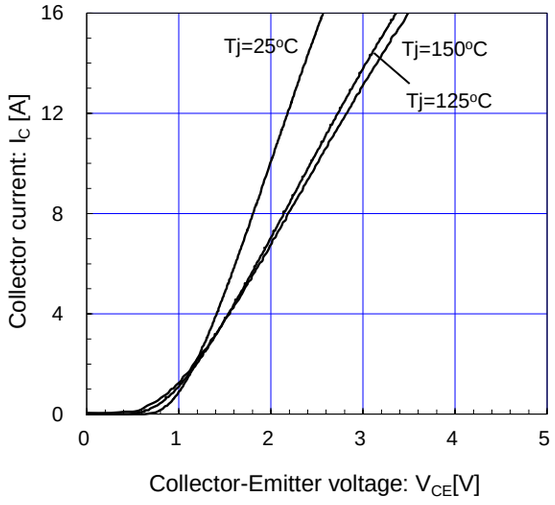
[Inverter / Brake]
Collector current vs. Collector-Emitter voltage (typ.)
Tj= 25°C / chip



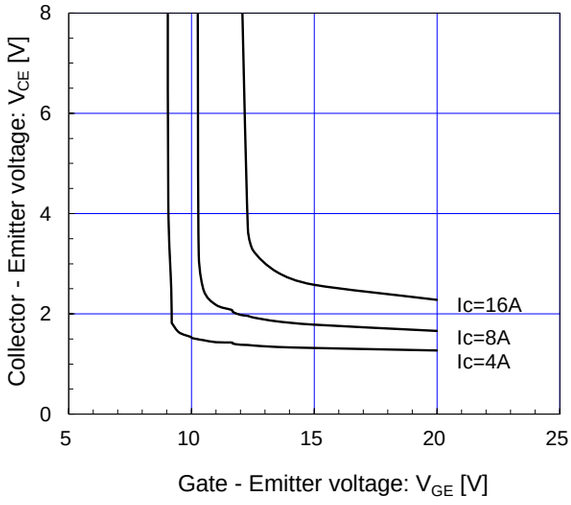
[Inverter / Brake]
Collector current vs. Collector-Emitter voltage (typ.)
Tj= 150°C / chip



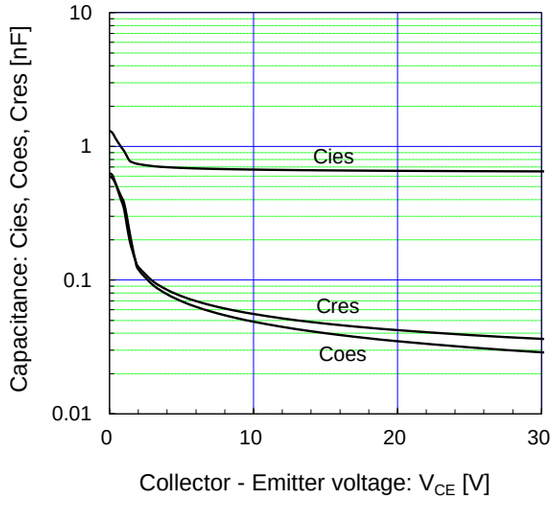
[Inverter / Brake]
Collector current vs. Collector-Emitter voltage (typ.)
VGE=15V / chip



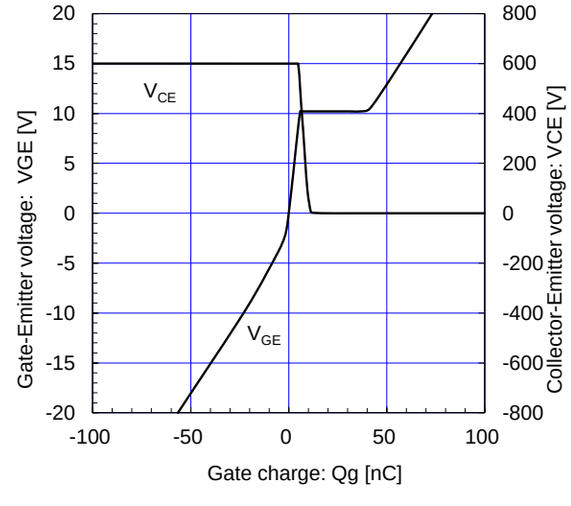
[Inverter / Brake]
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.
Tj= 25°C / chip



[Inverter / Brake]
Capacitance vs. Collector-Emitter voltage (typ.)
VGE=0V, f= 1MHz, Tj= 25°C



[Inverter / Brake]
Dynamic gate charge (typ.)
Vcc=600V . Ic=8A . Ti=25°C



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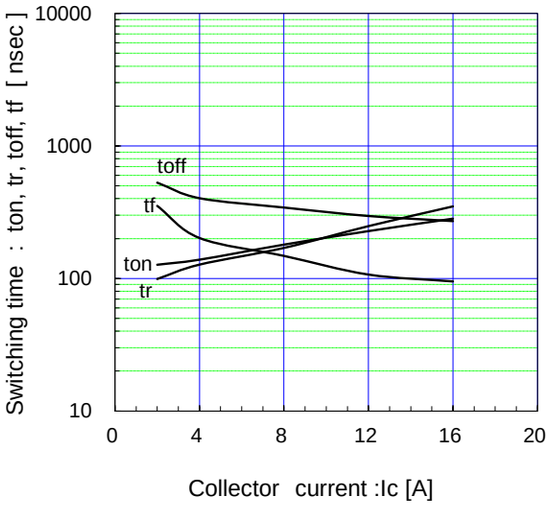
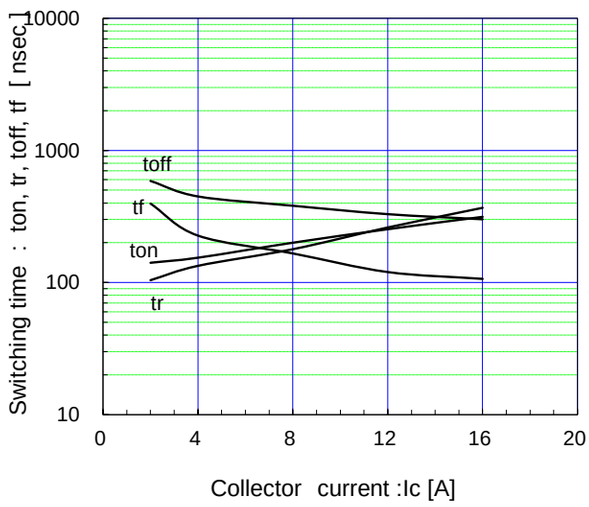
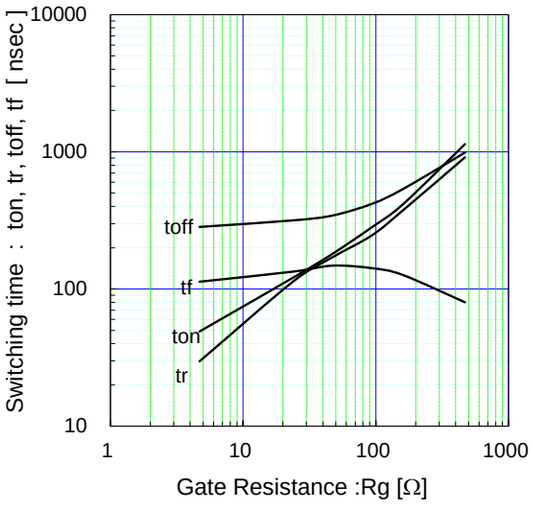
[Inverter]
Switching time vs. Collector current (typ.)
Vcc=600V, VGE=±15V, Rg=47Ω, Tj= 125°C



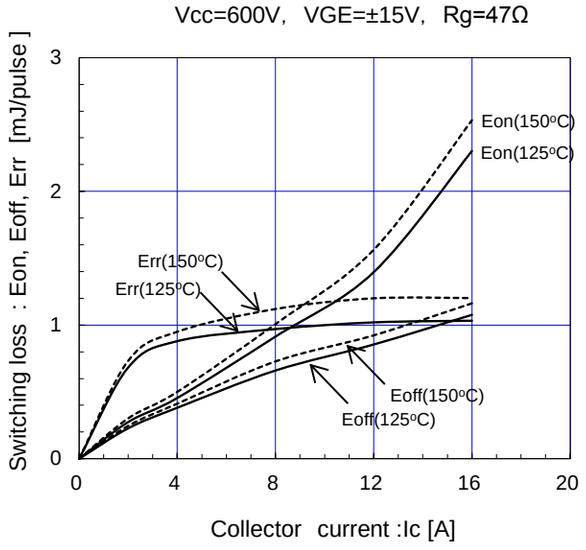
[Inverter]
Switching time vs. Collector current (typ.)
Vcc=600V, VGE=±15V, Rg=47Ω, Tj= 150°C



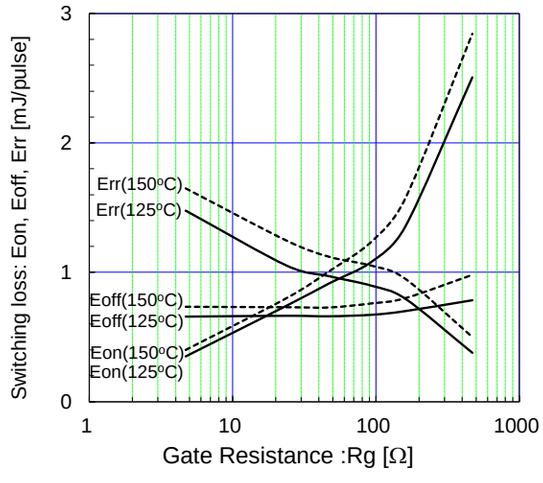
[Inverter]
Switching time vs. Gate resistance (typ.)
Vcc=600V, Ic=8A, VGE=±15V, Tj= 125°C



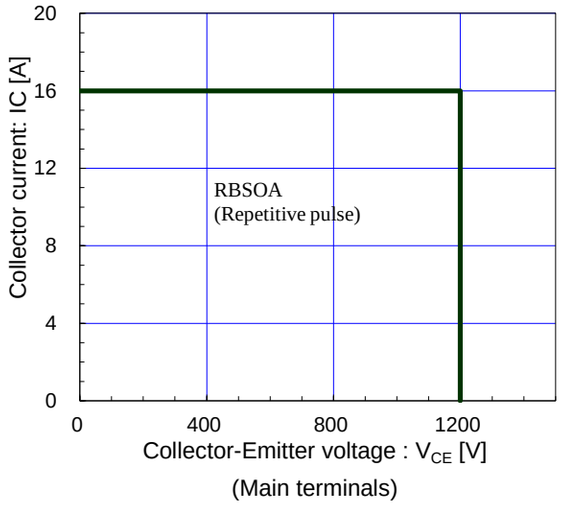
[Inverter]
Switching loss vs. Collector current (typ.)
Vcc=600V, VGE=±15V, Rg=47Ω



[Inverter]
Switching time vs. Gate resistance (typ.)
Vcc=600V, Ic=8A, VGE=±15V



[Inverter]
Reverse bias safe operating area (max.)
+VGE=15V,-VGE <= 15V, Rg >= 47Ω ,Tj = 150°C



(Main terminals)

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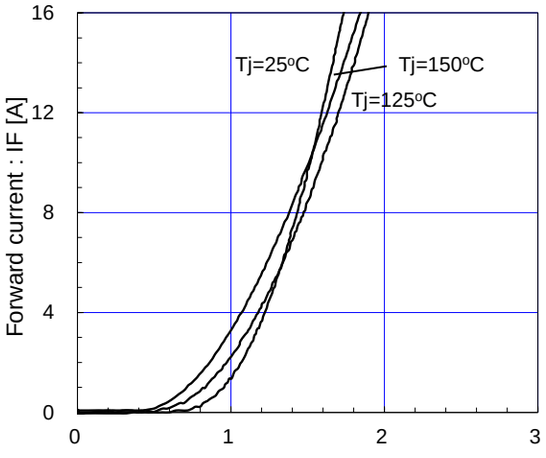
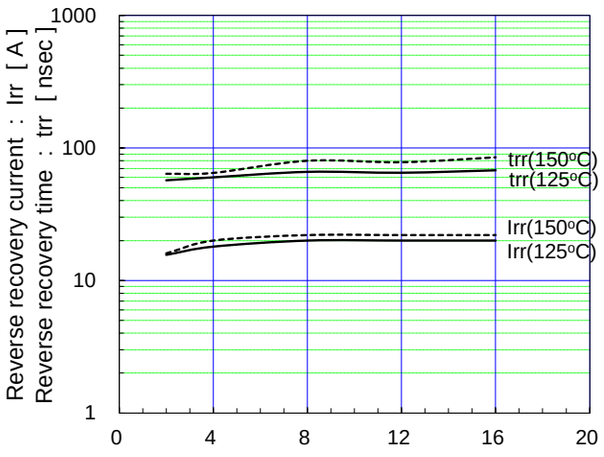
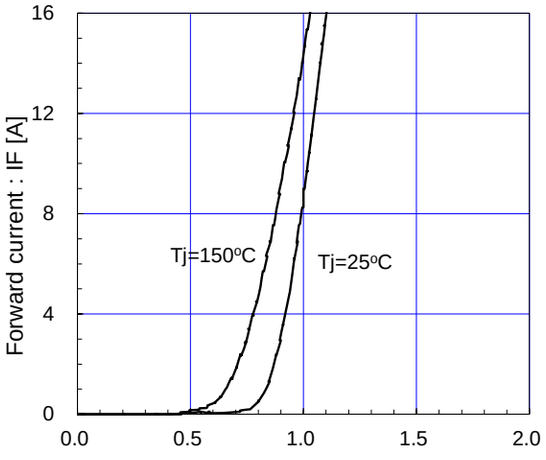
[Inverter / Brake]
Forward current vs. forward on voltage (typ.)
chip



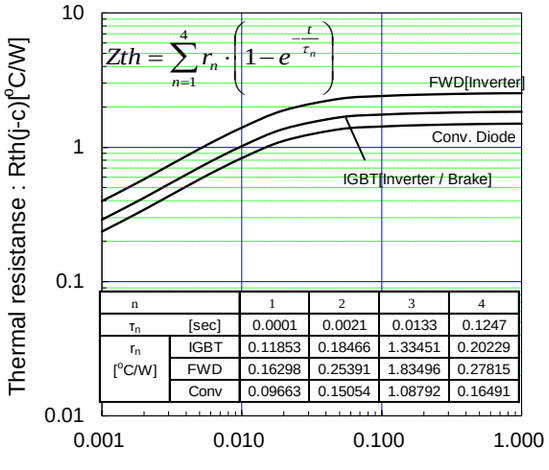
[Inverter]
Reverse recovery characteristics (typ.)
Vcc=600V, VGE=±15V, Rg=47Ω



[Converter]
Forward current vs. forward on voltage (typ.)
chip

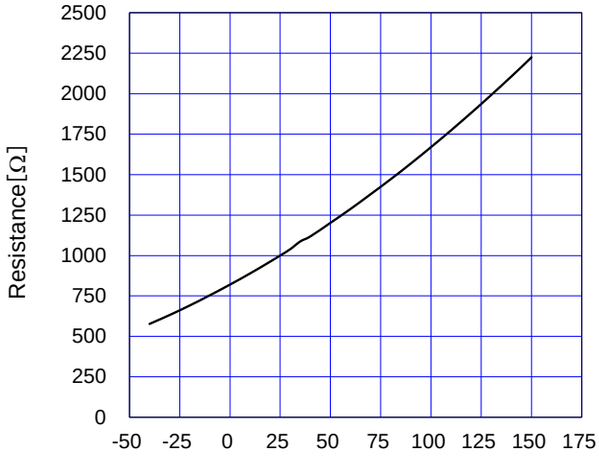


Transient thermal resistance (typ.)



n		1	2	3	4
τn	[sec]	0.0001	0.0021	0.0133	0.1247
rn [ºC/W]	IGBT	0.11853	0.18466	1.33451	0.20229
	FWD	0.16298	0.25391	1.83496	0.27815
	Conv	0.09663	0.15054	1.08792	0.16491

[Temperature Sensor]
Temperature characteristic(typ.)



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   ・Machine tools ・Audiovisual equipment ・Electrical home appliances ・Personal equipment ・Industrial robots etc.

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   ・Emergency equipment for responding to disasters and anti-burglary devices ・Safety devices ・Medical equipment

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7.

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IGBT Modules

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