

7MBR8VJA120-50

IGBT Modules

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

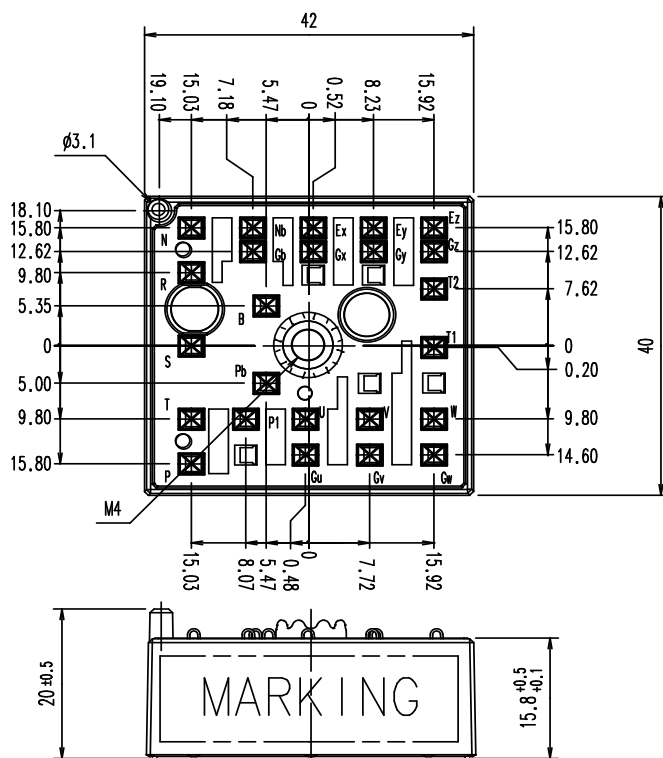
■ Features

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

■ Applications

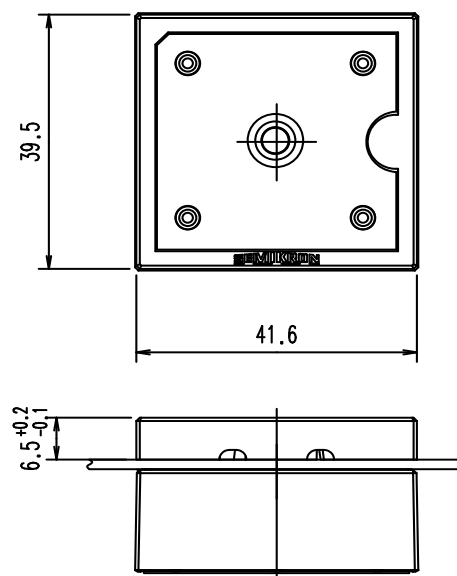
Inverter for Motor Drives
 AC and DC Servo Drive Amplifier
 Uninterruptible Power Supply

■ Outline drawing (Unit : mm)



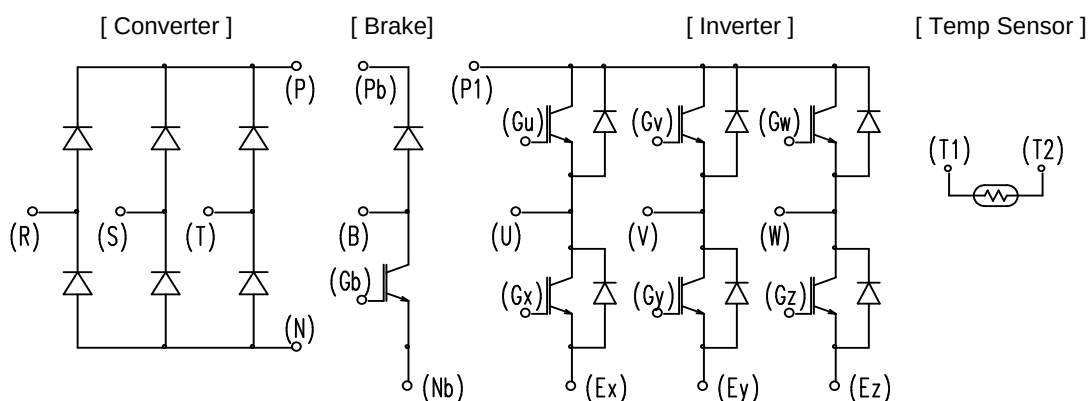
単位 / Unit : mm
 公差 / tolerance : ISO 2768-f

STANDARD LID USE



Weight: 40g (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	Tc=100°C	8	A
		I_{CP}	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		185	A
	I^2t (Non-Repetitive)	I^2t	half sine wave		170	A ² s
	Surge current (Non-Repetitive)	I_{FSM}	10ms, Tj=25°C		220	A
	I^2t (Non-Repetitive)	I^2t	half sine wave		240	A ² s
	Junction temperature	Tj	Inverter, Brake		175	°C
			Converter		150	
Operating junction 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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■ Electrical characteristics (at Tj= 25°C unless otherwise specified)

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Inverter	Zero gate voltage collector current	$V_{GE} = 0V$ $V_{CE} = 1200V$	-	-	1.0	mA
	Gate-Emitter leakage current	$V_{CE} = 0V$ $V_{GE} = \pm 20V$	-	-	200	nA
	Gate-Emitter threshold voltage	$V_{CE} = 20V$ $I_C = 8mA$	6.0	6.5	7.0	V
	Collector-Emitter saturation voltage	$V_{GE} = 15V$ $I_C = 8A$	$T_j = 25^\circ C$	1.90	2.35	V
			$T_j = 125^\circ C$	2.25	-	
			$T_j = 150^\circ C$	2.30	-	
		$V_{GE} = 15V$ $I_C = 8A$	$T_j = 25^\circ C$	1.80	2.25	
			$T_j = 125^\circ C$	2.15	-	
			$T_j = 150^\circ C$	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	$V_{CC} = 600V$ $I_C = 8A$	t_{on}	0.16	1.20	μs
			t_r	0.12	0.60	
			$t_{r(i)}$	0.01	-	
	Turn-off time	$V_{GE} = \pm 15V$ $R_G = 47 \Omega$	t_{off}	0.26	1.00	μs
			t_f	0.09	0.30	
	Forward on voltage	V_F (terminal) $I_F = 8A$	$T_j = 25^\circ C$	1.55	2.00	V
			$T_j = 125^\circ C$	1.60	-	
			$T_j = 150^\circ C$	1.50	-	
		V_F (chip) $I_F = 8A$	$T_j = 25^\circ C$	1.45	1.90	
			$T_j = 125^\circ C$	1.50	-	
			$T_j = 150^\circ C$	1.40	-	
	Reverse recovery time	t_{rr} $I_F = 8A$	-	-	0.35	μs
Brake	Zero gate voltage collector current	$V_{GE} = 0V$ $V_{CE} = 1200V$	-	-	1.0	mA
	Gate-Emitter leakage current	$V_{CE} = 0V$ $V_{GE} = \pm 20V$	-	-	200	nA
	Collector-Emitter saturation voltage	$V_{GE} = 15V$ $I_C = 8A$	$T_j = 25^\circ C$	1.90	2.35	V
			$T_j = 125^\circ C$	2.25	-	
			$T_j = 150^\circ C$	2.30	-	
		$V_{GE} = 15V$ $I_C = 8A$	$T_j = 25^\circ C$	1.80	2.25	
			$T_j = 125^\circ C$	2.15	-	
			$T_j = 150^\circ C$	2.20	-	
	Collector power disipation	Pc	1 device	80	-	W
	Internal gate resistance	Rg(int)	-	0	-	Ω
	Turn-on time	$V_{CE} = 600V$ $I_C = 8A$	t_{on}	0.16	1.20	μs
			t_r	0.12	0.60	
	Turn-off time	$V_{GE} = +15/-15V$ $R_G = 47 \Omega$	t_{off}	0.26	1.00	μs
			t_f	0.09	0.30	
Converter	Reverse current	I_{RRM} $V_R = 1200V$	-	-	1.00	mA
	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	$T = 25^\circ C$ $I_m = 1mA$	-	1000	-	Ω
		$T = 100^\circ C$ $I_m = 1mA$	-	1670	-	

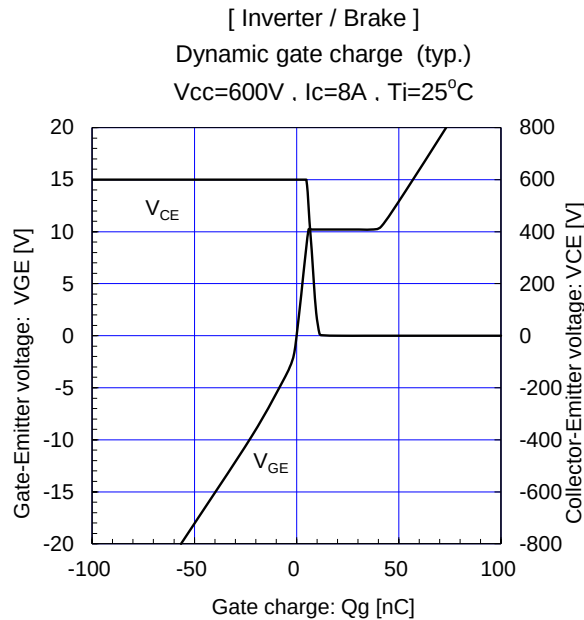
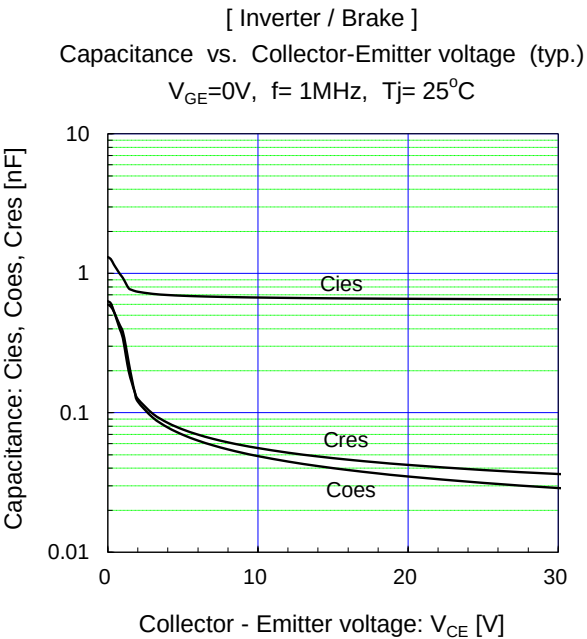
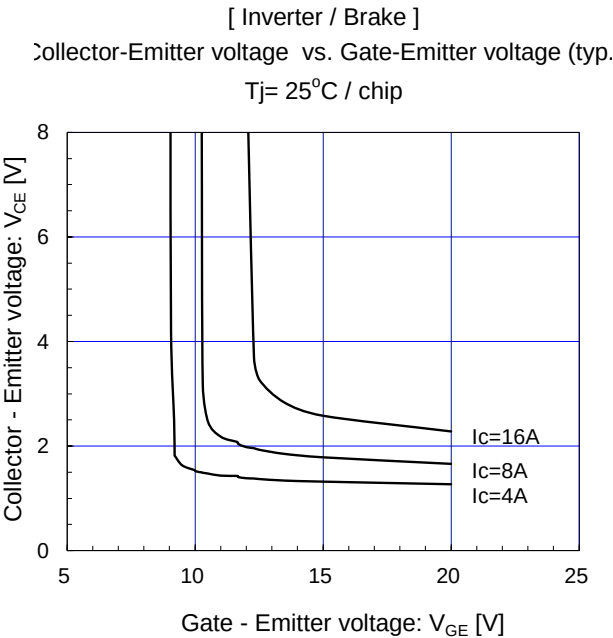
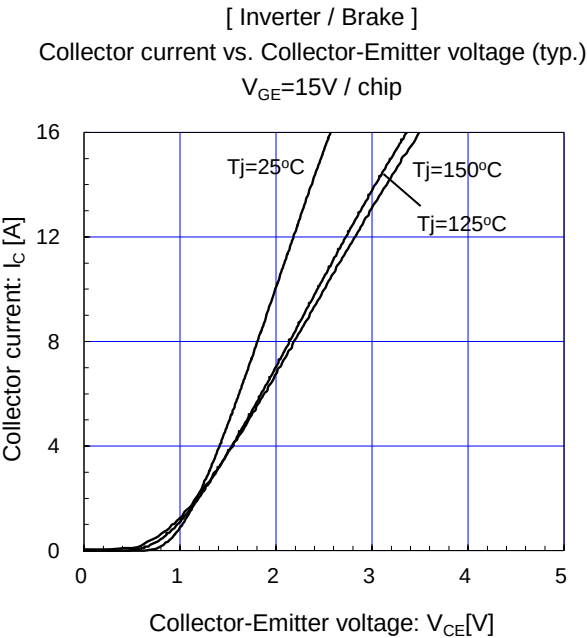
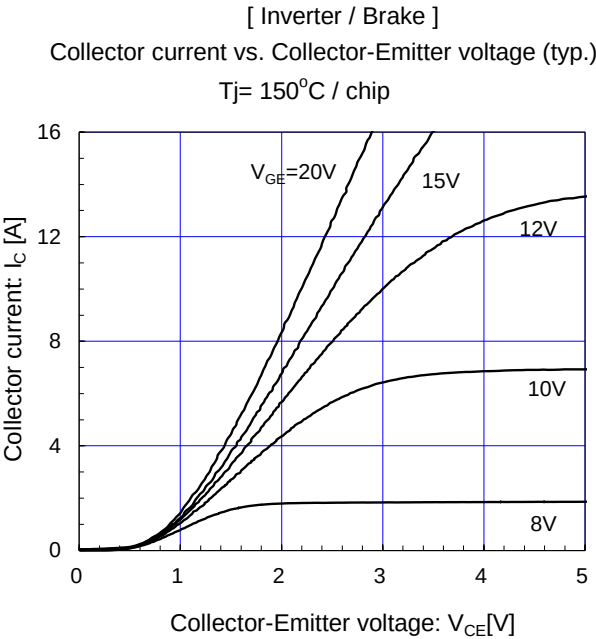
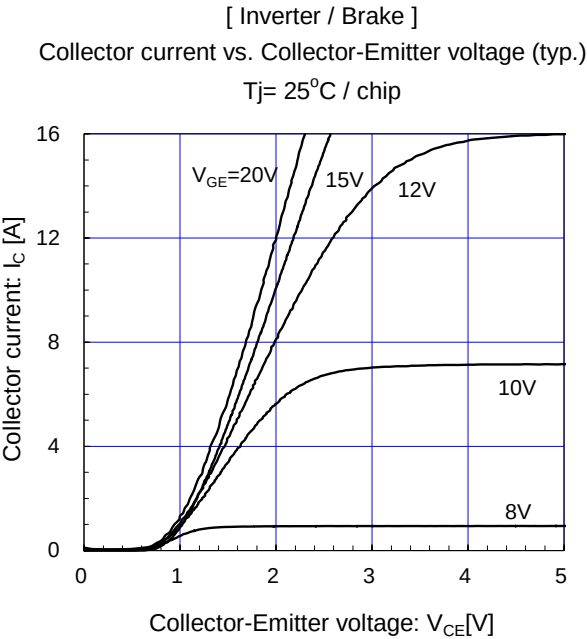
■ Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance(1device)	Rth(j-c)	Inverter / Brake IGBT	-	1.84	-	$^\circ C/W$
		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.

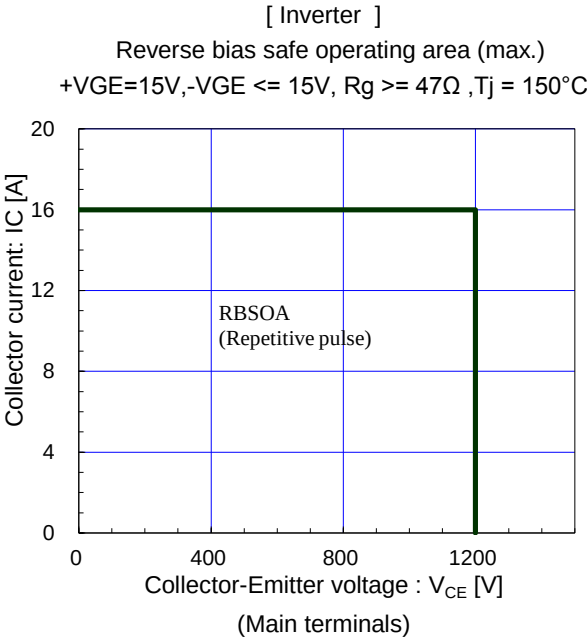
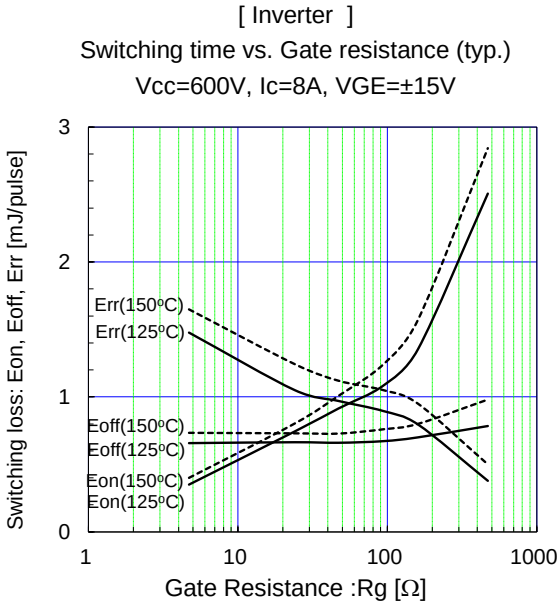
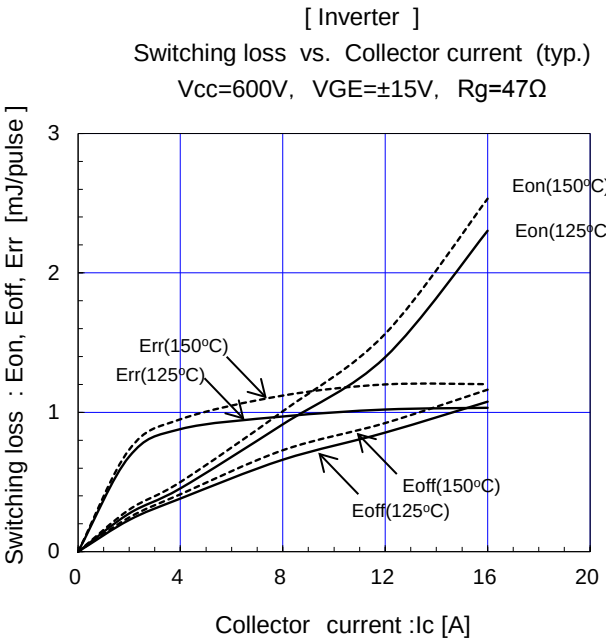
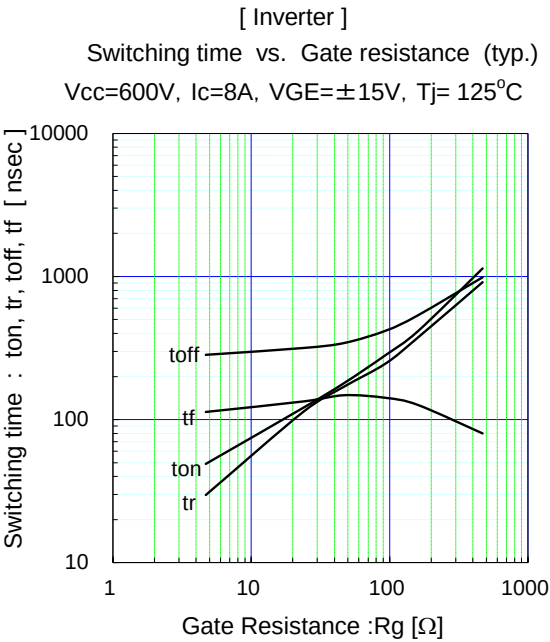
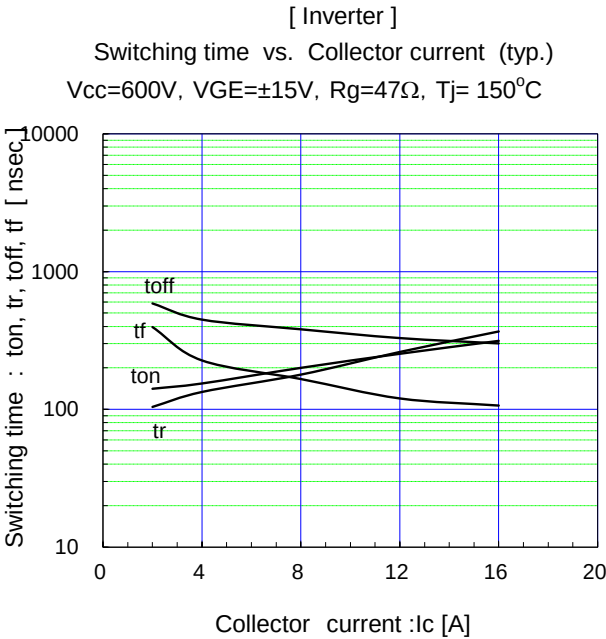
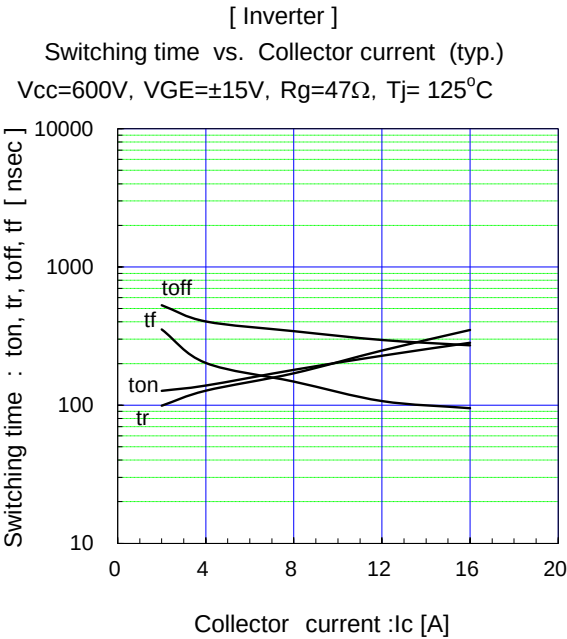
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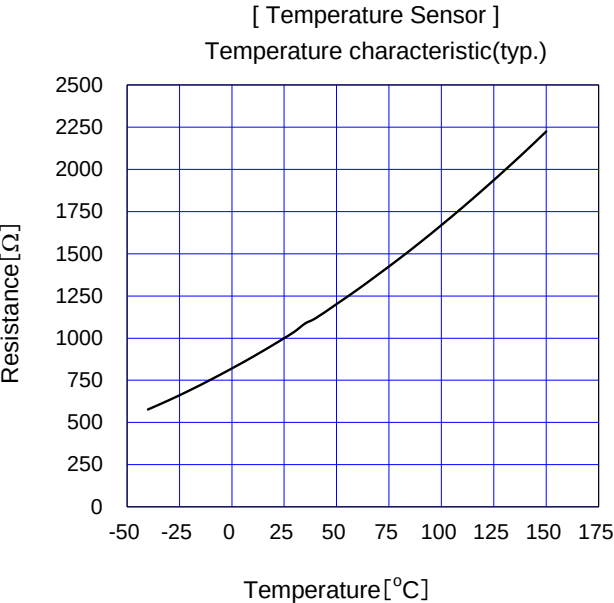
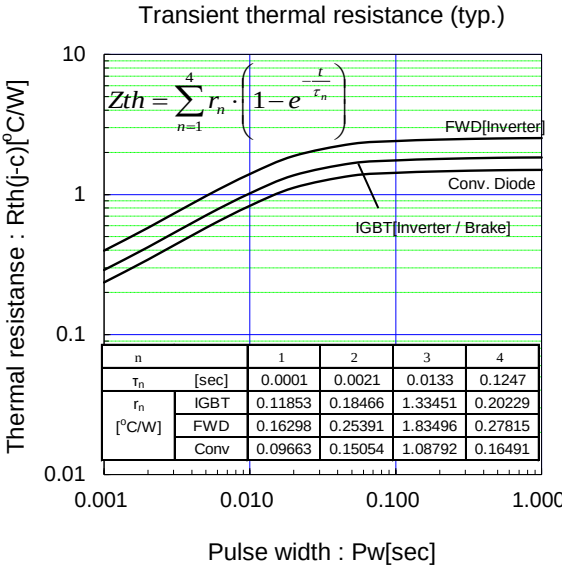
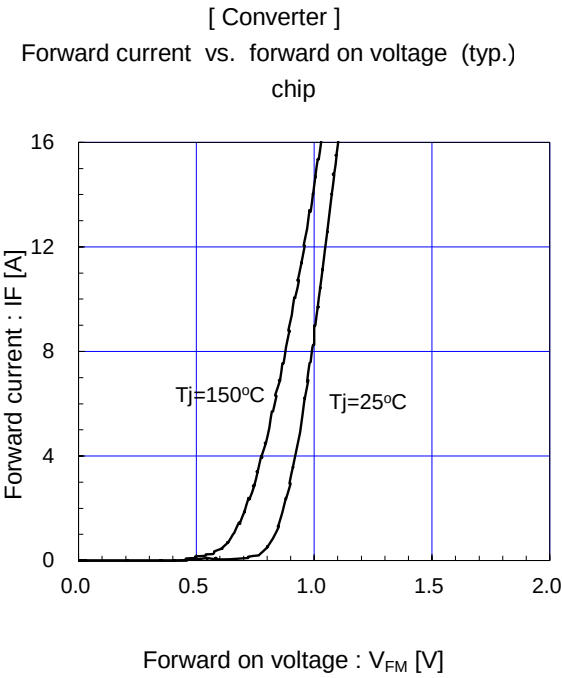
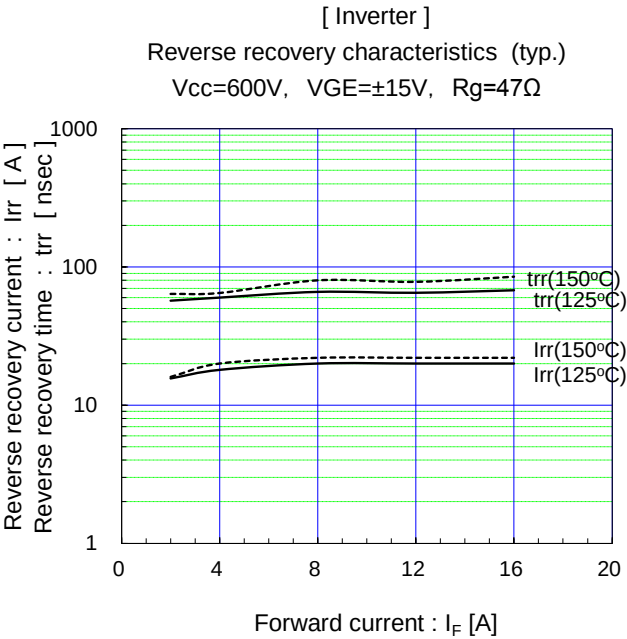
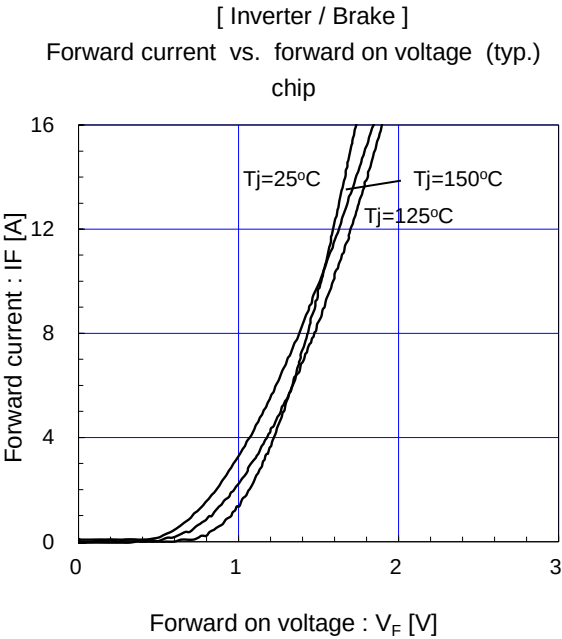
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