

# 7MBR100VJC120-50

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

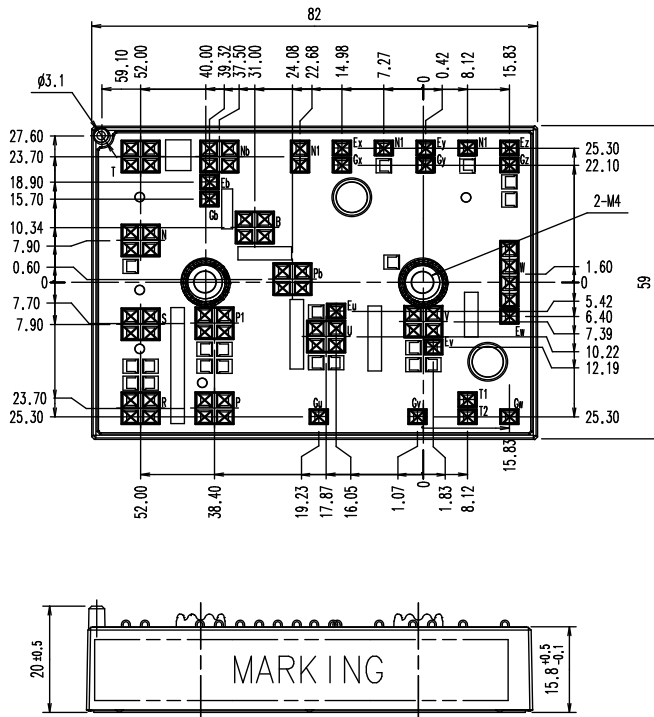
■ **Applications**

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

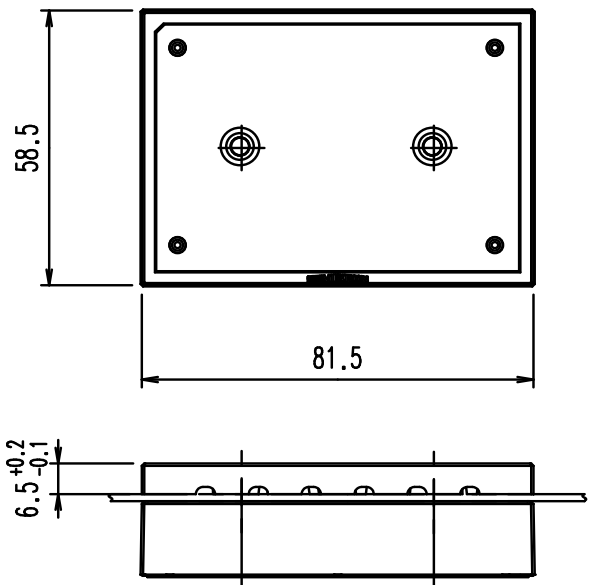
■ **Outline drawing ( Unit : mm )**



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

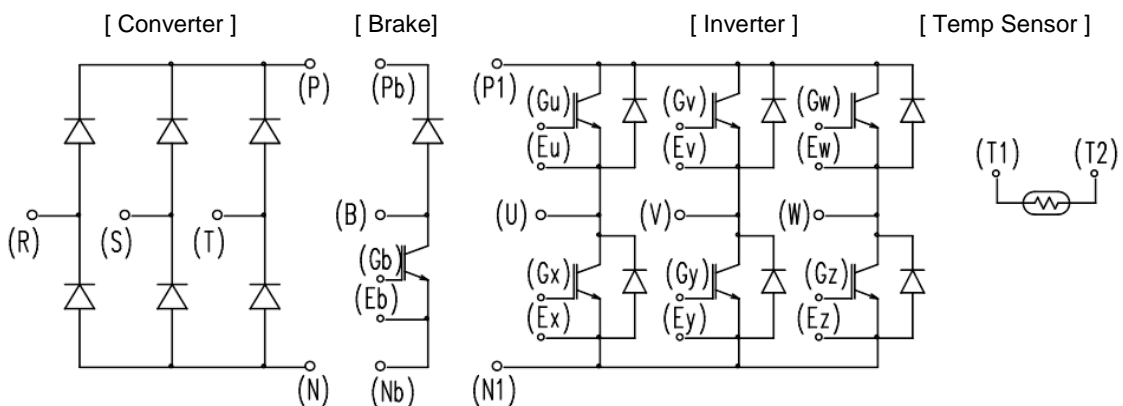


STANDARD LID USE



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	$V_{GES}$			$\pm 20$	V	
	Collector current	$I_C$	Continuous	$T_C=100^\circ\text{C}$	100	A	
		$I_{CP}$	1ms	$T_C=80^\circ\text{C}$	200		
		$-I_C$			100		
$-I_C$ pulse		1ms			200		
Brake	Collector-Emitter voltage	$V_{CES}$			1200	V	
	Gate-Emitter voltage	$V_{GES}$			$\pm 20$	V	
	Collector current	$I_C$	Continuous	$T_C=80^\circ\text{C}$	100	A	
		$I_{CP}$	1ms	$T_C=80^\circ\text{C}$	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, $T_J=150^\circ\text{C}$		890	A	
	$I^2t$ (Non-Repetitive)	$I^2t$	half sine wave		3900	$\text{A}^2\text{s}$	
	Surge current (Non-Repetitive)	$I_{FSM}$	10ms, $T_J=25^\circ\text{C}$		1000	A	
	$I^2t$ (Non-Repetitive)	$I^2t$	half sine wave		5000	$\text{A}^2\text{s}$	
Junction temperature		$T_J$	Inverter, Brake			175	$^\circ\text{C}$
			Converter			150	
Operating junction 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	$I_{GES}$	$V_{CE} = 0V$ $V_{GE} = \pm 20V$	-	-	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)	$V_{GE} = 15V$ $I_C = 100A$	$T_j = 25^\circ C$	-	2.10	2.55	V
				$T_j = 125^\circ C$	-	2.40	-	
				$T_j = 150^\circ C$	-	2.45	-	
		$V_{CE(sat)}$ (chip)	$V_{GE} = 15V$ $I_C = 100A$	$T_j = 25^\circ C$	-	1.75	2.20	
				$T_j = 125^\circ C$	-	2.05	-	
				$T_j = 150^\circ C$	-	2.10	-	
	Collector power disipation	$P_c$	1 device	-	315	-	W	
	Internal gate resistance	$R_{g(int)}$	-	-	7.5	-	$\Omega$	
	Input capacitance	$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0V, f = 1MHz$	-	9.1	-	nF	
	Turn-on time	$t_{on}$	$V_{CC} = 600V$ $I_C = 100A$	-	0.42	1.20	$\mu s$	
		$t_r$		-	0.11	0.60		
		$t_r(i)$		-	0.04	-		
Turn-off time	$t_{off}$	$V_{GE} = \pm 15V$ $R_G = 1 \Omega$	-	0.44	1.00	$\mu s$		
	$t_f$		-	0.06	0.30			
Forward on voltage	$V_F$ (terminal)	$I_F = 100A$	$T_j = 25^\circ C$	-	2.20	2.65	V	
			$T_j = 125^\circ C$	-	2.45	-		
			$T_j = 150^\circ C$	-	2.40	-		
	$V_F$ (chip)	$I_F = 100A$	$T_j = 25^\circ C$	-	1.85	2.30		
			$T_j = 125^\circ C$	-	2.10	-		
		$T_j = 150^\circ C$	-	2.05	-			
Reverse recovery time	$t_{rr}$	$I_F = 100A$	-	-	0.35	$\mu s$		
Brake	Zero gate voltage collector current	$I_{CES}$	$V_{GE} = 0V$ $V_{CE} = 1200V$	-	-	1.0	mA	
	Gate-Emitter leakage current	$I_{GES}$	$V_{CE} = 0V$ $V_{GE} = \pm 20V$	-	-	200	nA	
	Collector-Emitter saturation voltage	$V_{CE(sat)}$ (terminal)	$V_{GE} = 15V$ $I_C = 100A$	$T_j = 25^\circ C$	-	2.10	2.55	V
				$T_j = 125^\circ C$	-	2.40	-	
				$T_j = 150^\circ C$	-	2.45	-	
		$V_{CE(sat)}$ (chip)	$V_{GE} = 15V$ $I_C = 100A$	$T_j = 25^\circ C$	-	1.75	2.20	
				$T_j = 125^\circ C$	-	2.05	-	
				$T_j = 150^\circ C$	-	2.10	-	
	Collector power disipation	$P_c$	1 device	-	315	-	W	
	Internal gate resistance	$R_{g(int)}$	-	-	7.5	-	$\Omega$	
	Turn-on time	$t_{on}$	$V_{CE} = 600V$ $I_C = 100A$	-	0.42	1.20	$\mu s$	
		$t_r$		-	0.11	0.60		
	Turn-off time	$t_{off}$	$V_{GE} = \pm 15V$ $R_G = 1 \Omega$	-	0.44	1.00	$\mu s$	
		$t_f$		-	0.06	0.30		
	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	-		
Reverse current	$I_{RRM}$	$V_R = 1600V$	-	-	1.0	mA		
Temperature Sensor	R	$T = 25^\circ C$	$I_m = 1mA$	-	1000	-	$\Omega$	
		$T = 100^\circ C$	$I_m = 1mA$	-	1670	-		

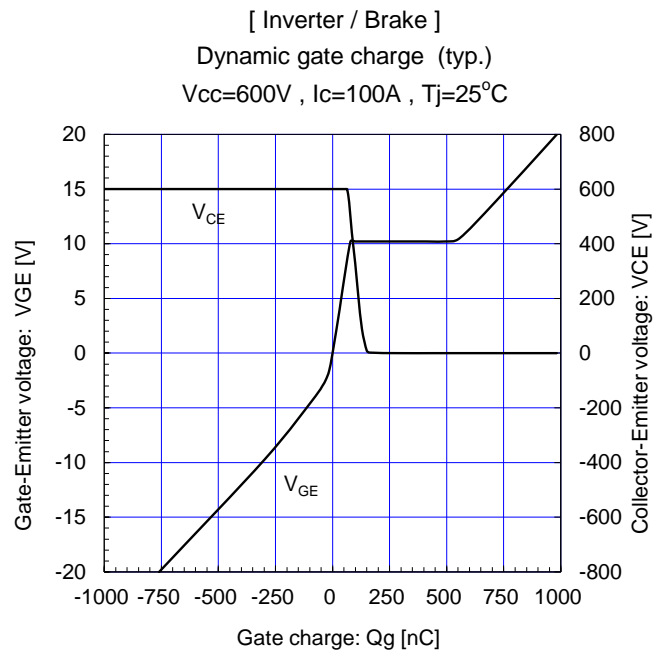
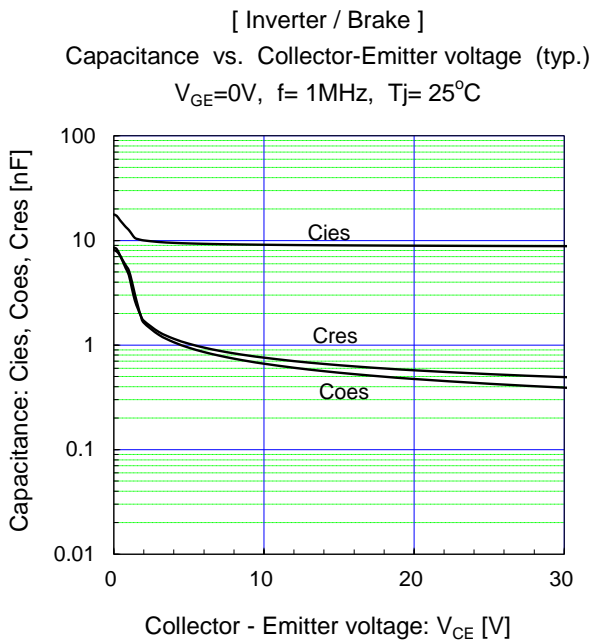
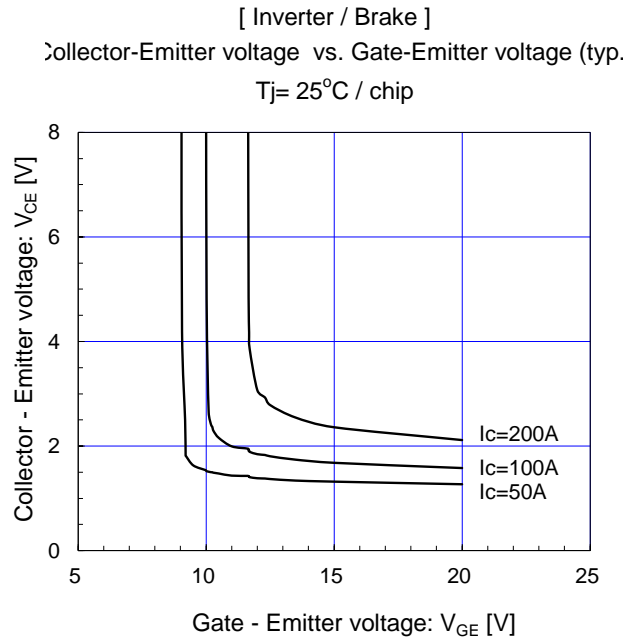
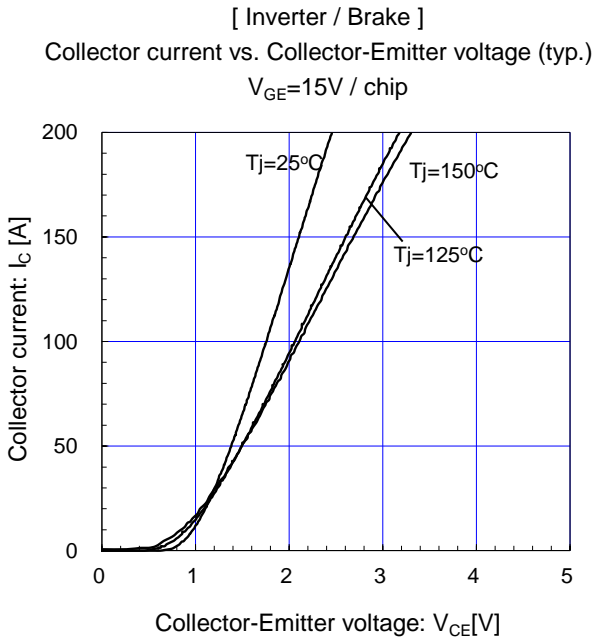
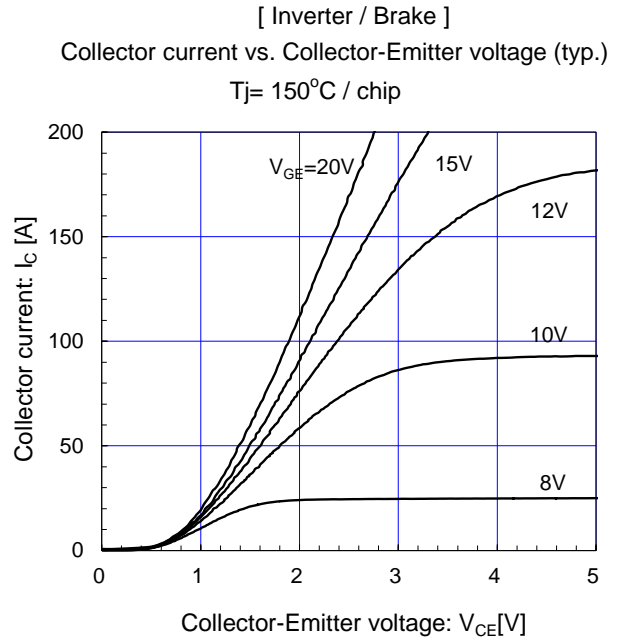
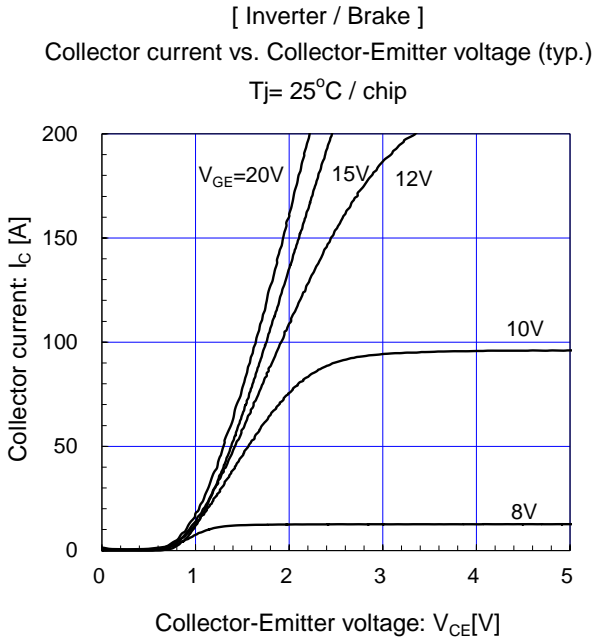
■ Thermal resistance characteristics

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

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

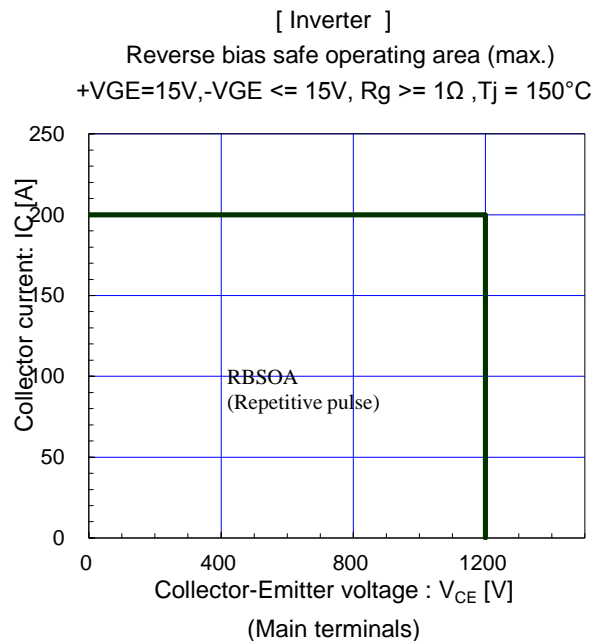
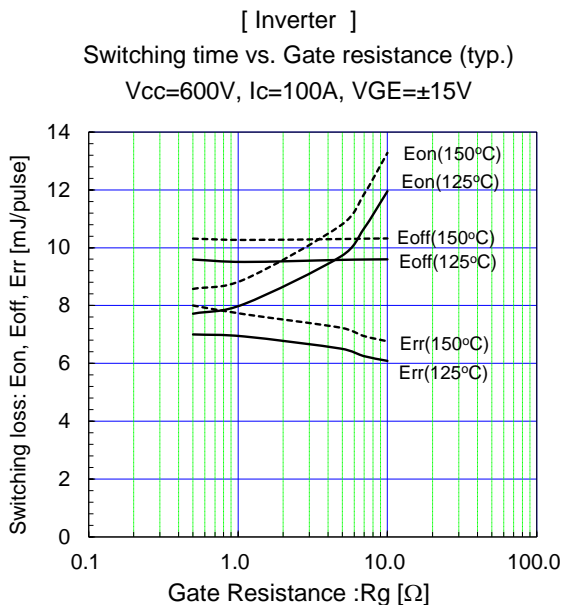
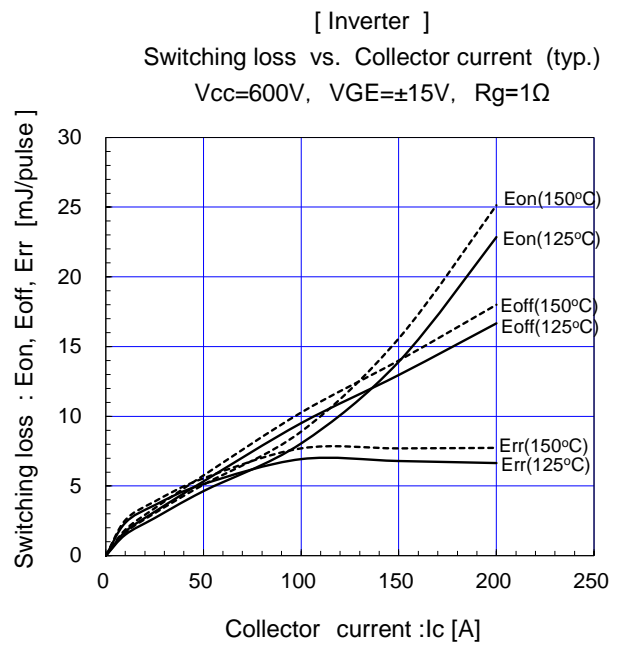
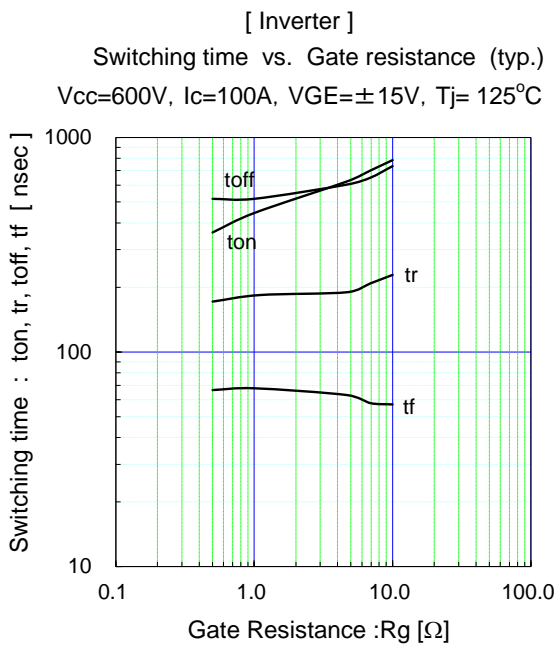
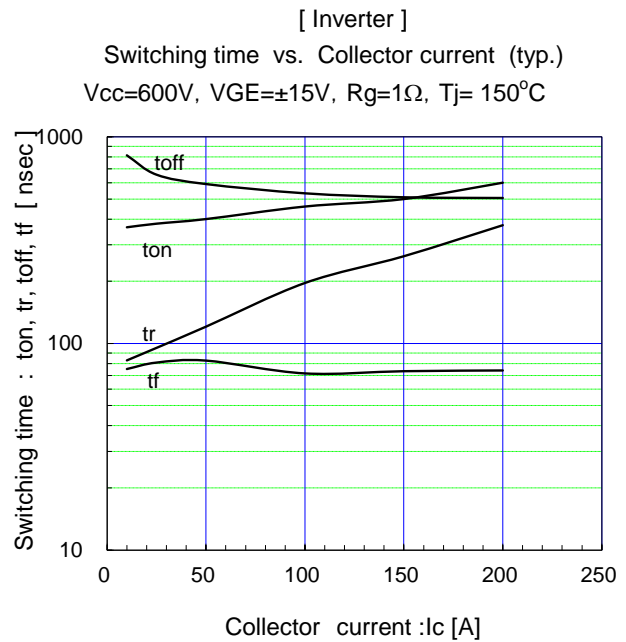
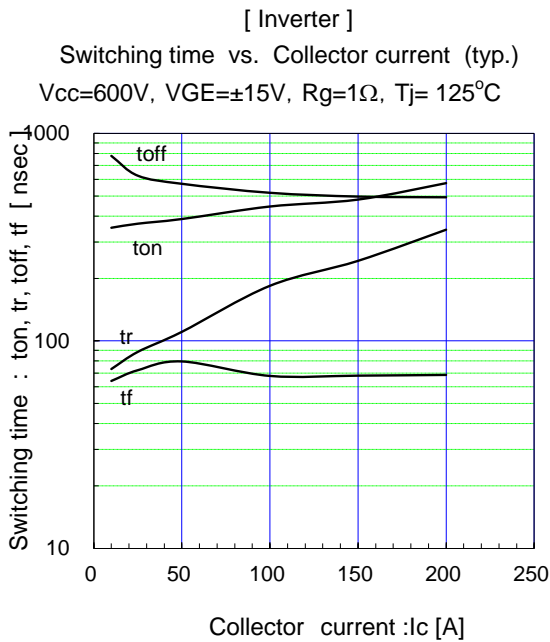
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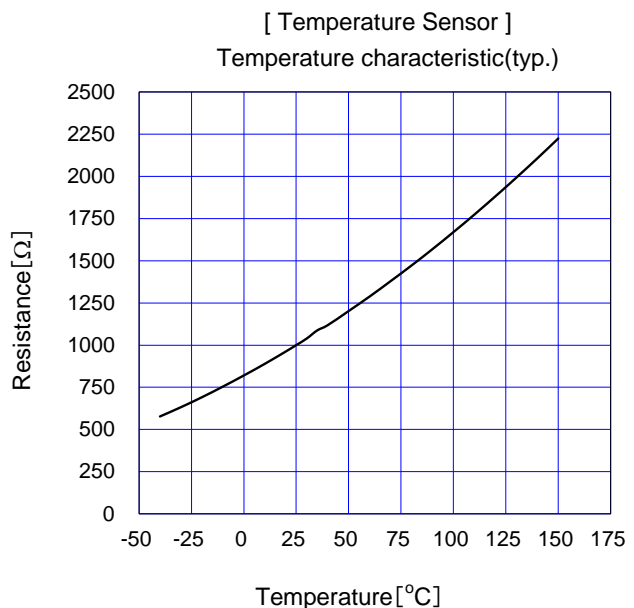
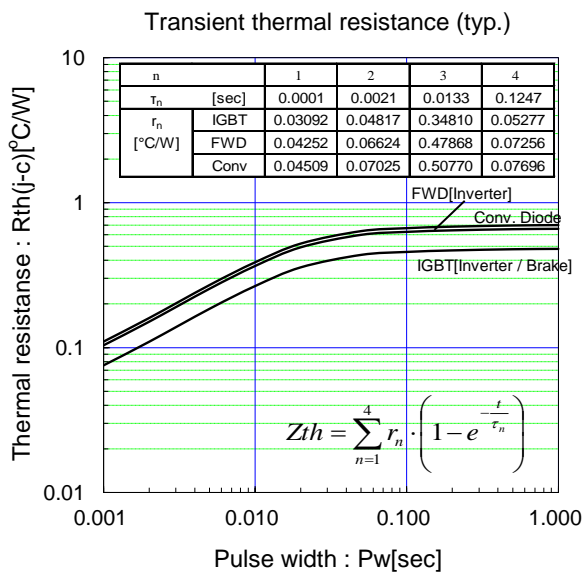
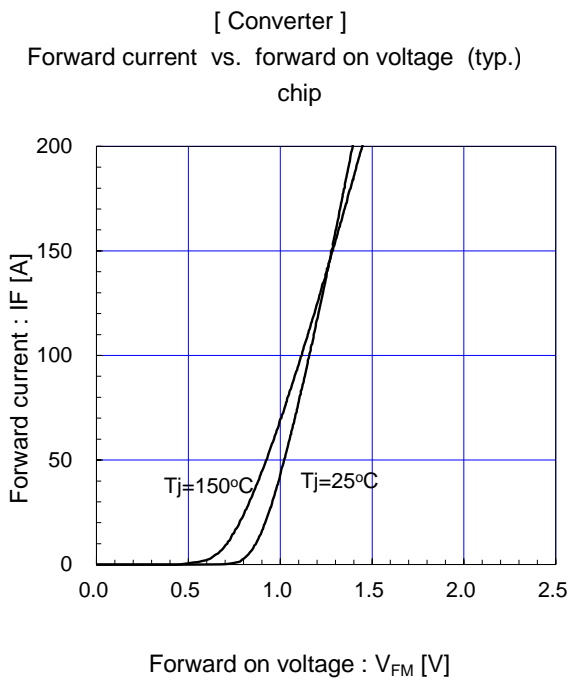
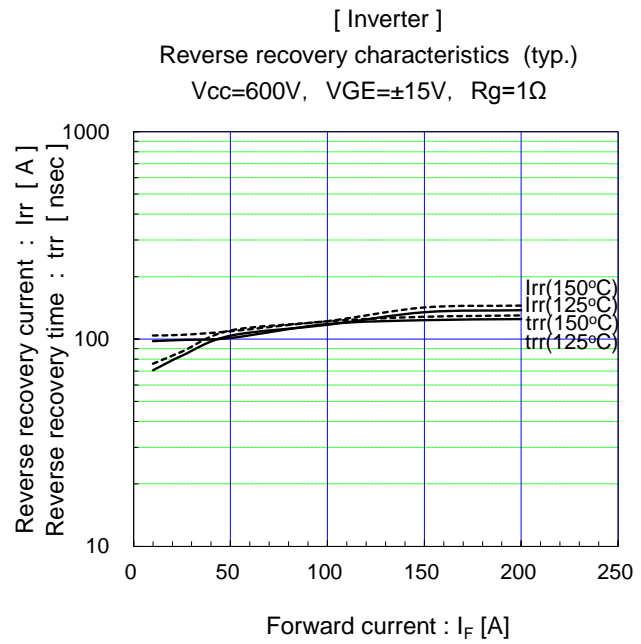
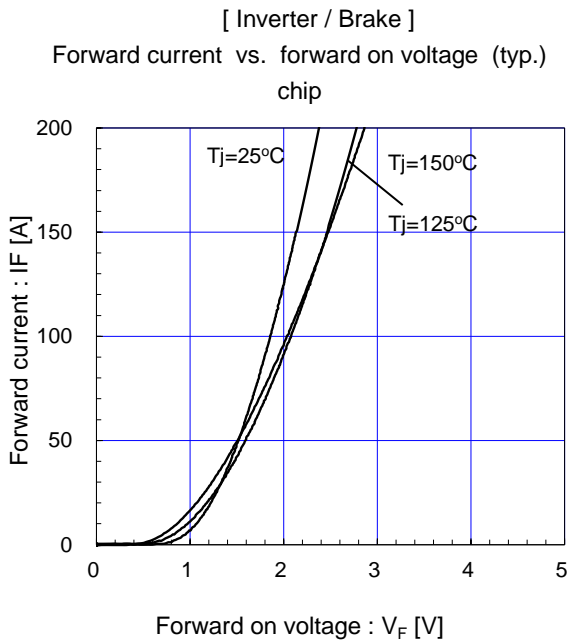
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