

600V / 20A 6 in one-package

■ Features

- Compact Single in -line package

■ Applications

- Inverter for Motor drive
- AC and DC Servo drive amplifier
- Uninterruptible power supply
- Industrial machines, such as Welding machines

■ Maximum ratings and characteristics

● Absolute maximum ratings (at Tc=25°C unless otherwise specified)

Item		Symbol	Rating	Unit
Collector-Emitter voltage		V _{CES}	600	V
Gate-Emitter voltage		V _{GES}	±20	V
Collector current	Continuous	I _c	20	A
	1ms	I _c pulse	40	A
		-I _c	20	A
	1ms	-I _c pulse	40	A
Max. power dissipation		P _c	70	W
Operating temperature		T _j	+150	°C
Storage temperature		T _{stg}	-40 to +125	°C
Isolation voltage		V _{is}	AC 2000 (1min.)	V
Screw torque		Mounting *1	1.7	N·m

*1 : Recommendable value : 1.3 to 1.7 N·m (M4)

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

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Zero gate voltage collector current	I _{CES}	—	—	1.0	V _{GE} =0V, V _{CES} =600V	mA
Gate-Emitter leakage current	I _{GES}	—	—	0.1	V _{CES} =0V, V _{GE} =±20V	μA
Gate-Emitter threshold voltage	V _{GE(th)}	5.5	—	8.5	V _{CES} =20V, I _C =20mA	V
Collector-Emitter saturation voltage	V _{CES(sat)}	—	—	2.8	V _{GE} =15V, I _C =20A	V
Input capacitance	C _{ies}	—	1300	—	V _{GE} =0V	pF
Output capacitance	C _{oes}	—	300	—	V _{CES} =10V	
Reverse transfer capacitance	C _{res}	—	72	—	f=1MHz	
Turn-on time	t _{on}	—	—	1.2	V _{CC} =300V	μs
	t _r	—	—	1.0	I _C =20A	
Turn-off time	t _{off}	—	—	1.0	V _{GE} =±15V	
	t _f	—	—	0.35	R _G =120ohm	
Diode forward on voltage	V _F	—	—	3.0	I _F =20A, V _{GE} =0V	V
Reverse recovery time	t _{rr}	—	—	0.3	I _F =20A, -di/dt=60A/μs, V _{GE} =-10V	μs

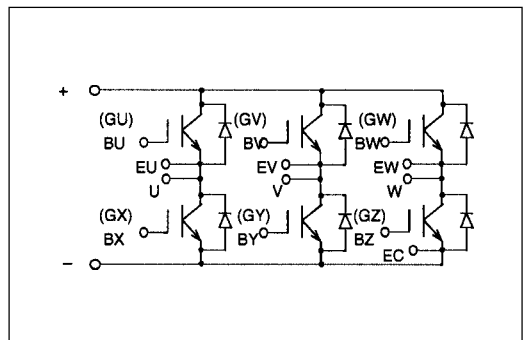
● Thermal resistance characteristics

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	R _{th(j-c)}	—	—	1.79	IGBT	°C/W
	R _{th(j-c)}	—	—	2.5	Diode	°C/W
	R _{th(c-f)*2}	—	0.06	—	the base to cooling fin	°C/W

*2 : This is the value which is defined mounting on the additional cooling fin with thermal compound

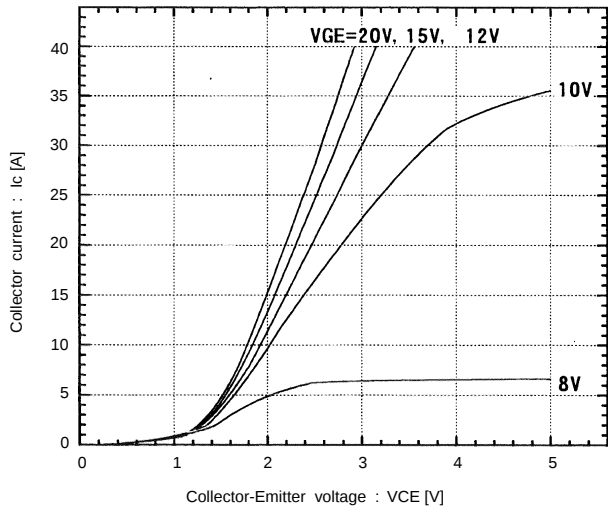


■ Equivalent Circuit Schematic

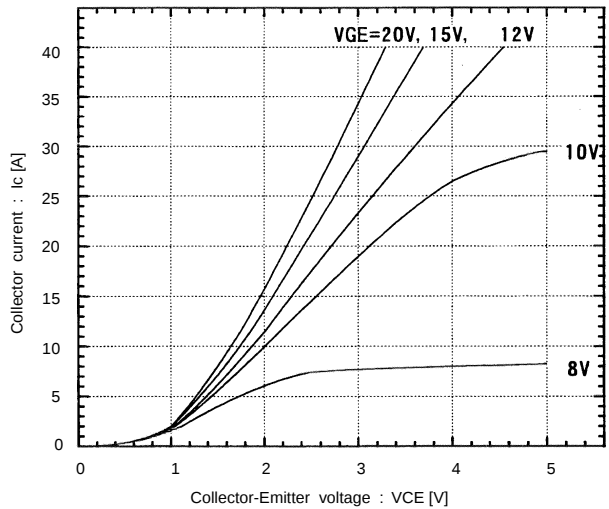


■ Characteristics (Representative)

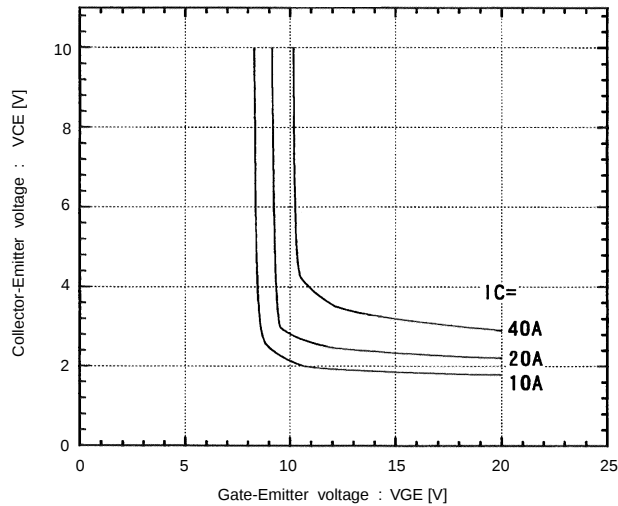
Collector current vs. Collector-Emitter voltage
 $T_J=25^{\circ}\text{C}$



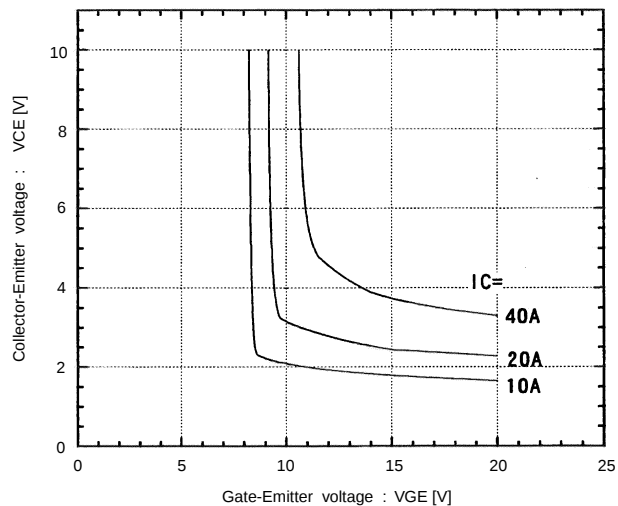
Collector current vs. Collector-Emitter voltage
 $T_J=125^{\circ}\text{C}$



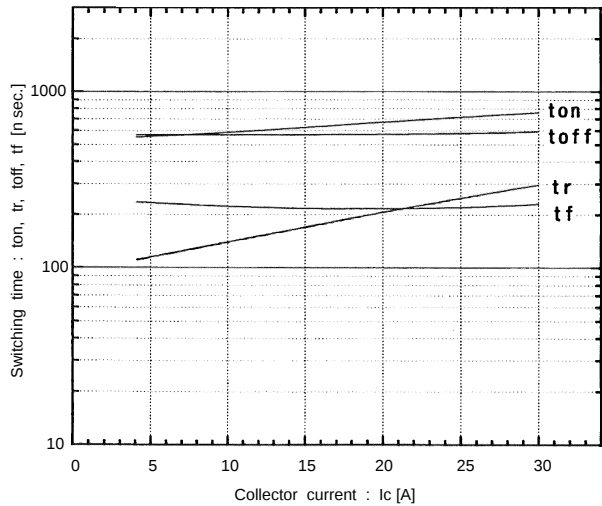
Collector-Emitter vs. Gate-Emitter voltage
 $T_J=25^{\circ}\text{C}$



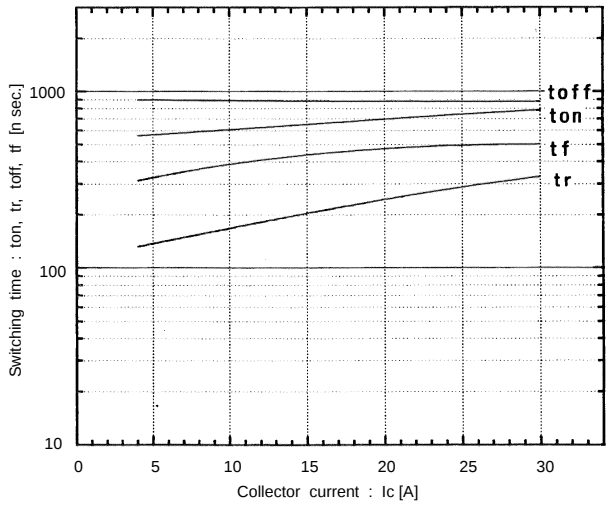
Collector-Emitter vs. Gate-Emitter voltage
 $T_J=125^{\circ}\text{C}$

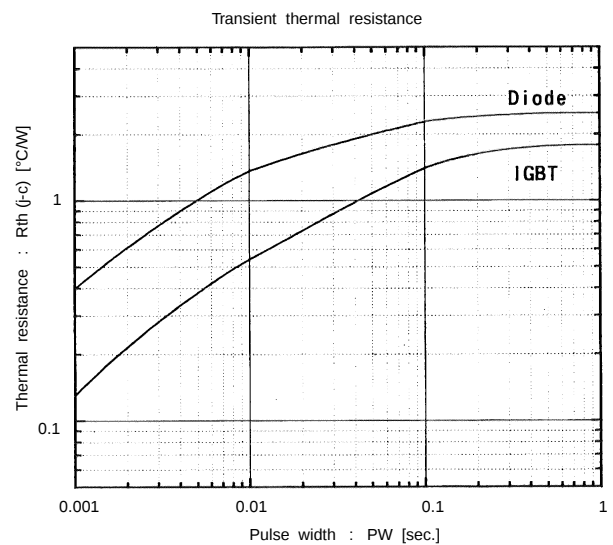
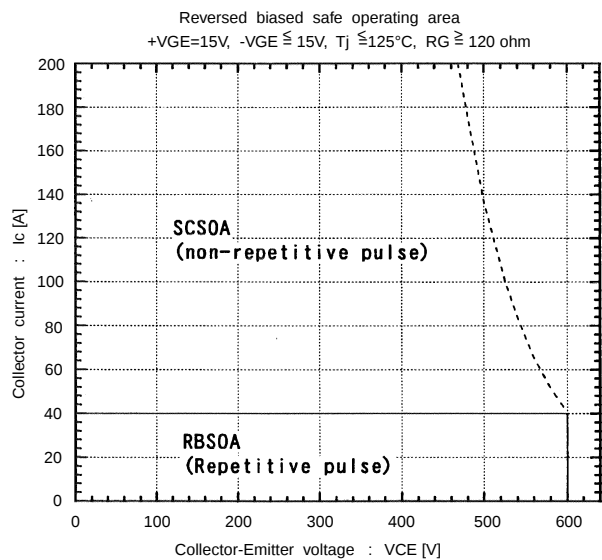
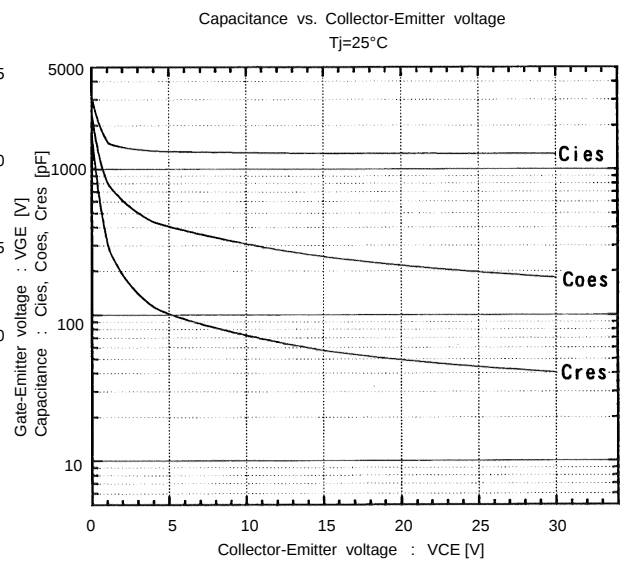
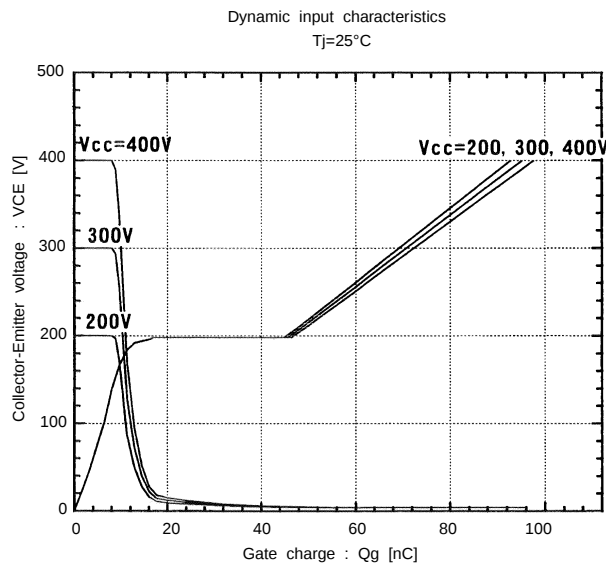
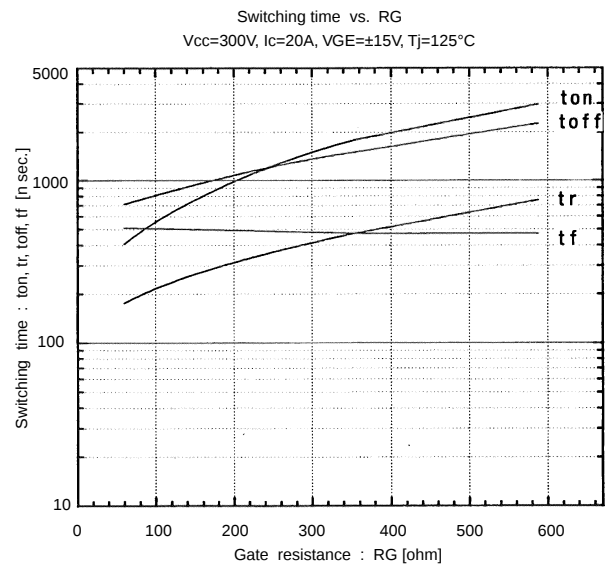
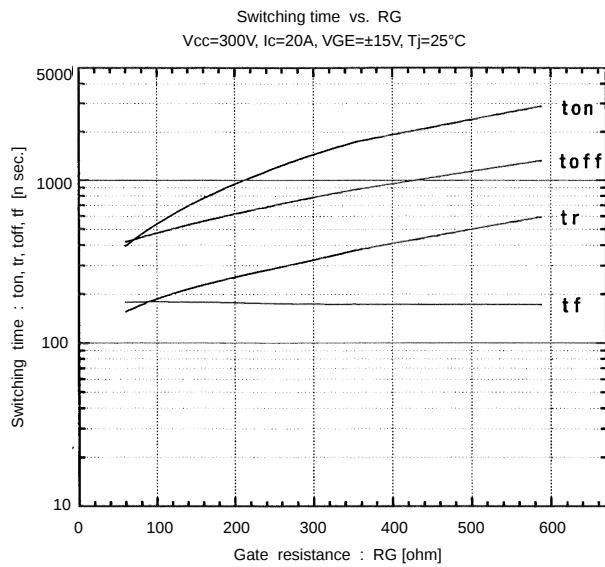


Switching time vs. Collector current
 $V_{CC}=300\text{V}$, $R_G=120\text{ ohm}$, $V_{GE}=\pm 15\text{V}$, $T_J=25^{\circ}\text{C}$

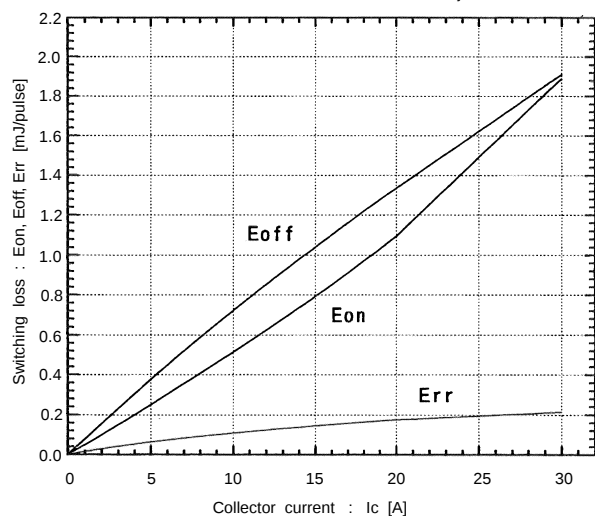


Switching time vs. Collector current
 $V_{CC}=300\text{V}$, $R_G=120\text{ ohm}$, $V_{GE}=\pm 15\text{V}$, $T_J=125^{\circ}\text{C}$

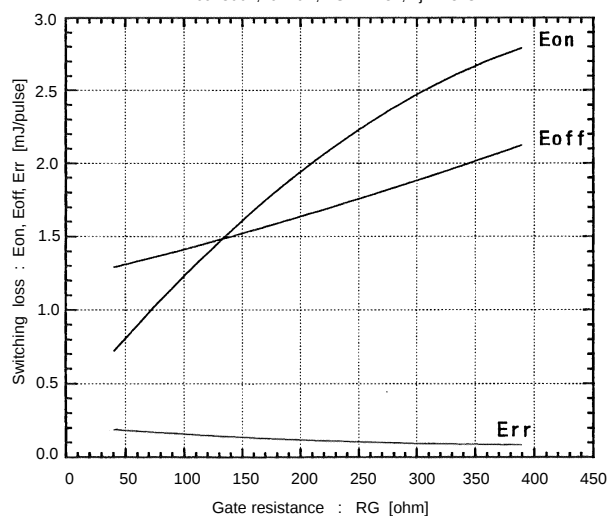




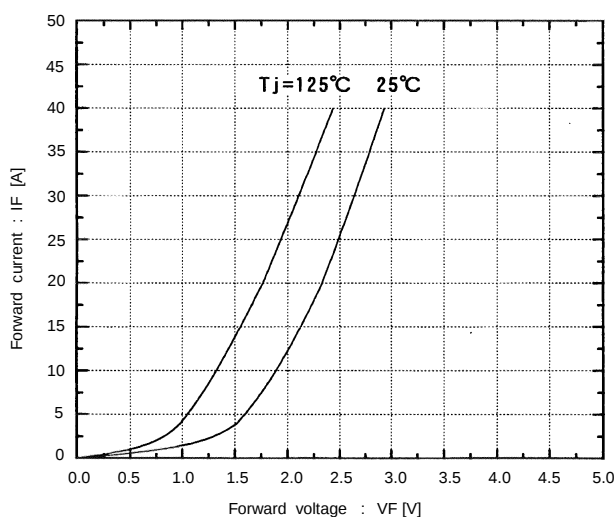
Switching loss vs. Collector current
 $V_{cc}=300V$, $R_G=120\ \Omega$, $V_{GE}=\pm 15V$, $T_J=125^\circ C$



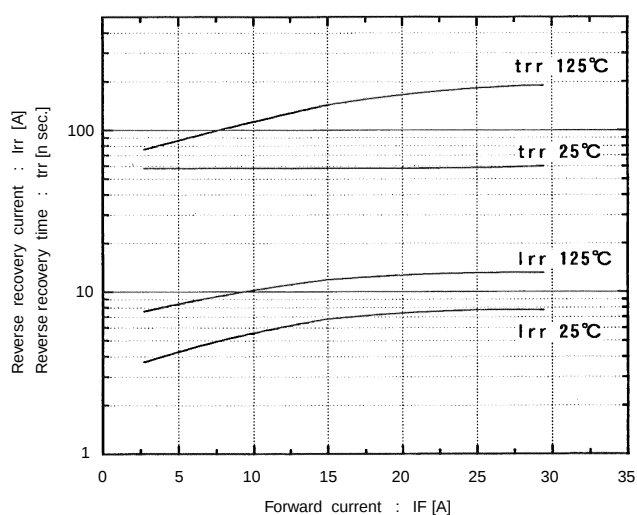
Switching loss vs. Gate resistance
 $V_{cc}=300V$, $I_c=20A$, $V_{GE}=\pm 15V$, $T_J=125^\circ C$



Forward current vs. Forward voltage



Reverse recovery characteristics
 t_{rr} , I_{rr} , vs. I_F



Outline Drawings, mm

