

6MBI100UC-120



IGBT Module U-Series 1200V / 100A 6 in one-package

■ Features

- High speed switching
- Voltage drive
- Low inductance module structure
- With shunt resustors

■ 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	Conditions		Rating	Unit
Collector-Emitter voltage		V _{CES}			1200	V
Gate-Emitter voltage		V _{GES}			±20	V
Collector current		I _c	Continuous	T _C =25°C	150	A
				T _C =80°C	100	
		I _{cp}	1ms	T _C =25°C	300	
				T _C =80°C	200	
		-I _c			100	
		-I _c pulse			200	
Collector Power Dissipation		P _c	1 device		520	W
Junction temperature		T _j			+150	°C
Storage temperature		T _{stg}			-40 to +125	
Isolation voltage	between terminal and copper base *1	V _{iso}	AC:1min.		2500	VAC
Screw Torque		Mounting *2			3.5	N·m

*1 : All terminals should be connected together when isolation test will be done.

*2 : Recommendable value : 2.5 to 3.5 N·m(M5)

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

Item	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
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	4.5	6.5	8.5	V
Collector-Emitter saturation voltage	V _{CE(sat)} (chip)	V _{GE} =15V, I _C =100A	T _J =25°C	1.75	2.10	V
			T _J =125°C	2.00	—	
Input capacitance	C _{ies}	V _{CE} =10V, V _{GE} =0V, f=1MHz	—	11	—	nF
Turn-on time	t _{on}	V _{CC} =600V I _C =100A V _{GE} =±15V R _G =5.6 Ω	—	0.36	1.20	μs
	t _r		—	0.21	0.60	
	t _{r(i)}		—	0.03	—	
	t _{off}		—	0.37	1.00	
Turn-off time	t _{off}	R _G =5.6 Ω	—	0.07	0.30	
	t _r		—	0.07	0.30	
Forward on voltage	V _F	V _{GE} =0V I _F =100A	T _J =25°C	1.60	1.90	V
	(chip)		T _J =125°C	1.70	—	
Reverse recovery time	t _{rr}	I _F =100A	—	—	0.35	μs
Lead resistance, terminal-chip*3	R _{lead}	Without shunt resistance	—	5.7	—	mΩ
Shunt resistance	R _{shunt}	Resistance of R1,R2,R3 *4	—	1.5	—	

*3: Biggest internal terminal resistance among arm.

*4: R1, R2,R3 is shown in equivalent circuit (p5)

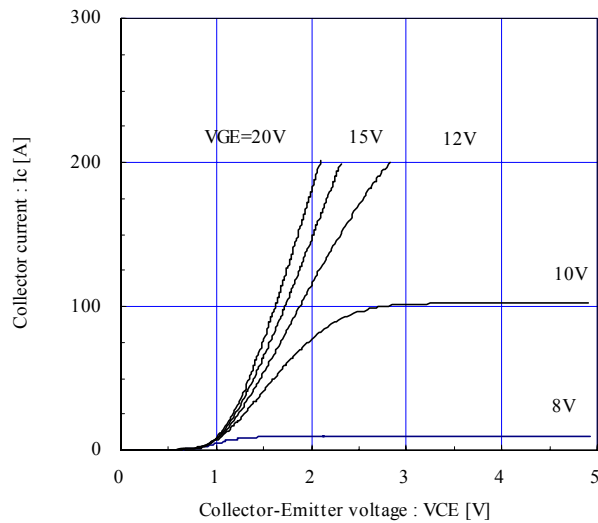
● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	R _{th(j-c)}	IGBT	—	—	0.24	°C/W
	R _{th(j-c)}	FWD	—	—	0.39	°C/W
Contact Thermal resistance	R _{th(c-f)*5}	With thermal compound	—	0.05	—	°C/W

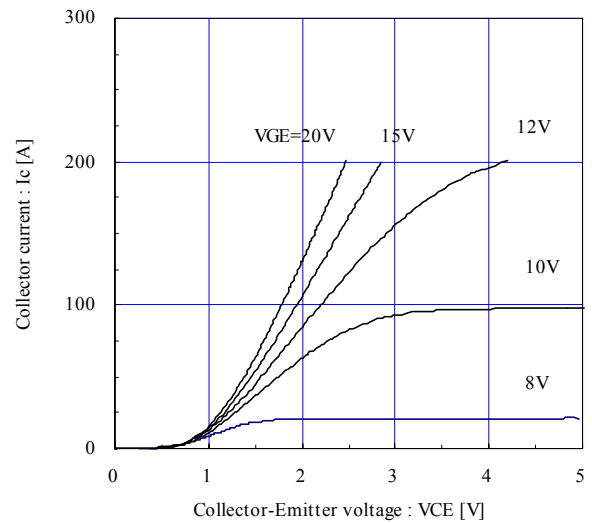
*5 : This is the value which is defined mounting on the additional cooling fin with thermal compound

Characteristics (Representative)

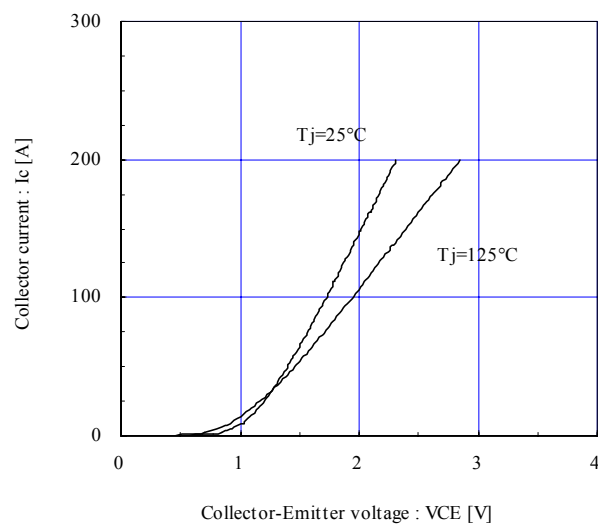
Collector current vs. Collector-Emitter voltage (typ.)

 $T_j = 25^\circ\text{C}$ / chip

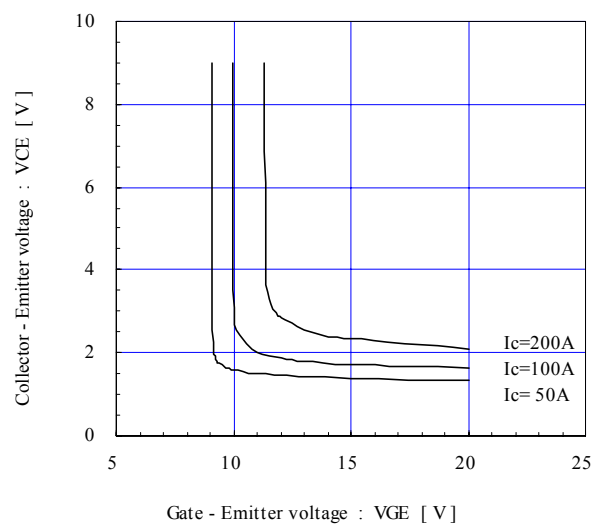
Collector current vs. Collector-Emitter voltage (typ.)

 $T_j = 125^\circ\text{C}$ / chip

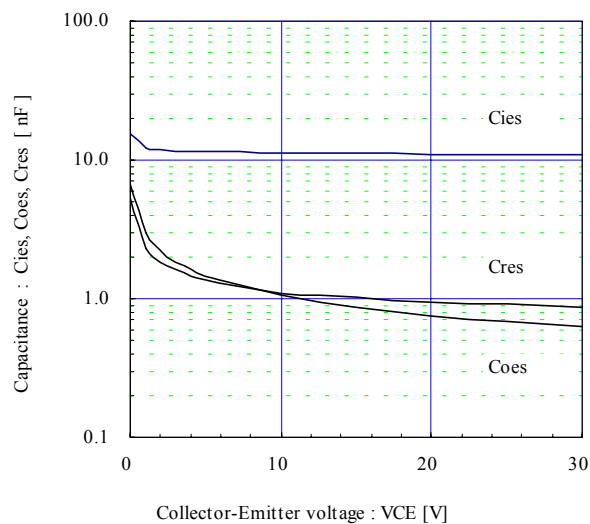
Collector current vs. Collector-Emitter voltage (typ.)

 $V_{GE} = 15\text{V}$ / chip

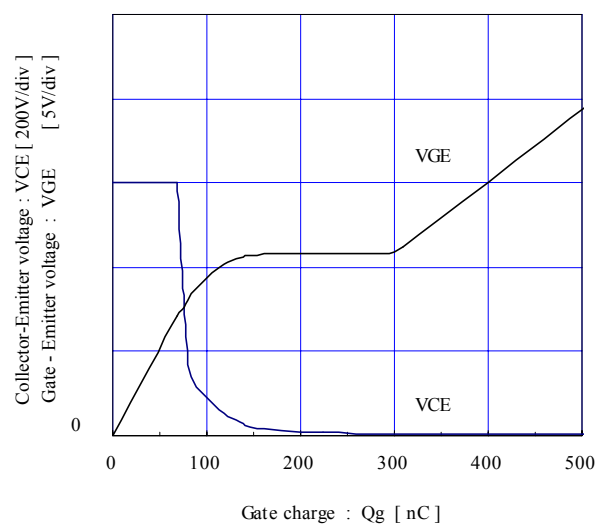
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)

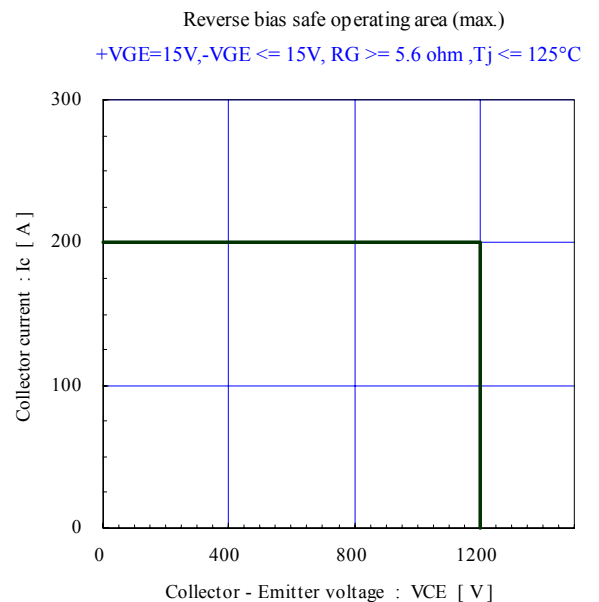
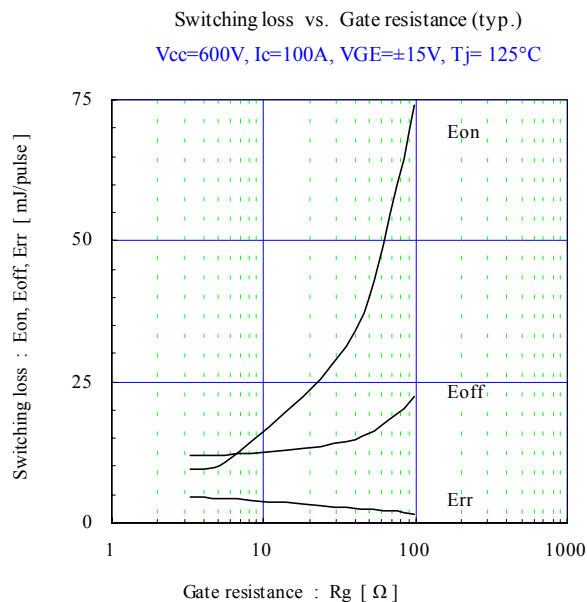
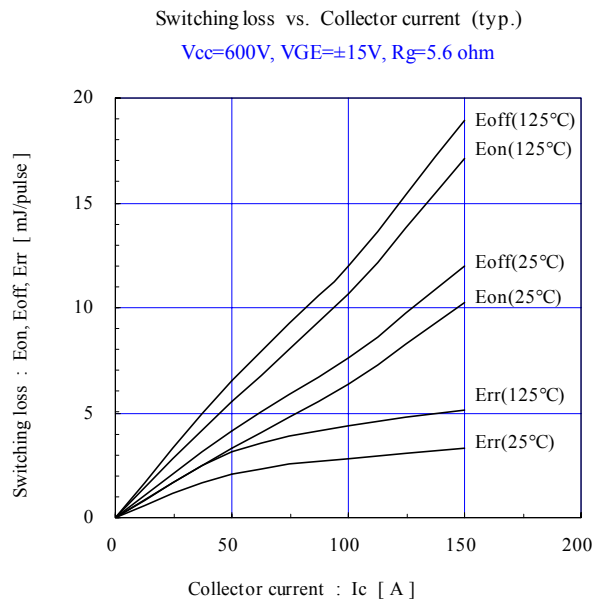
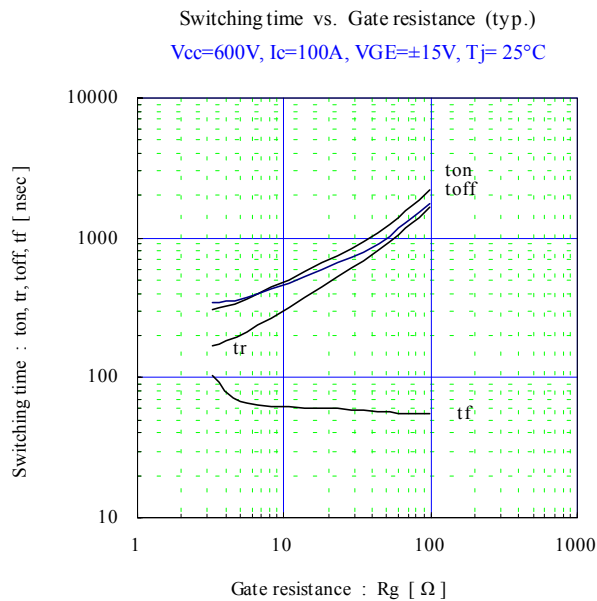
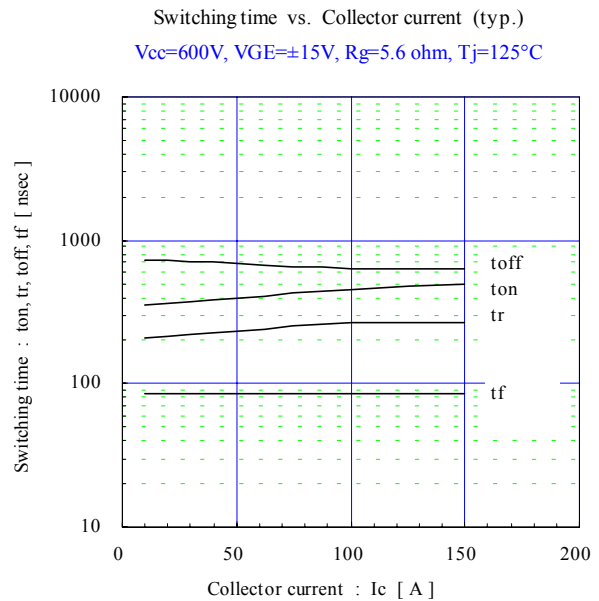
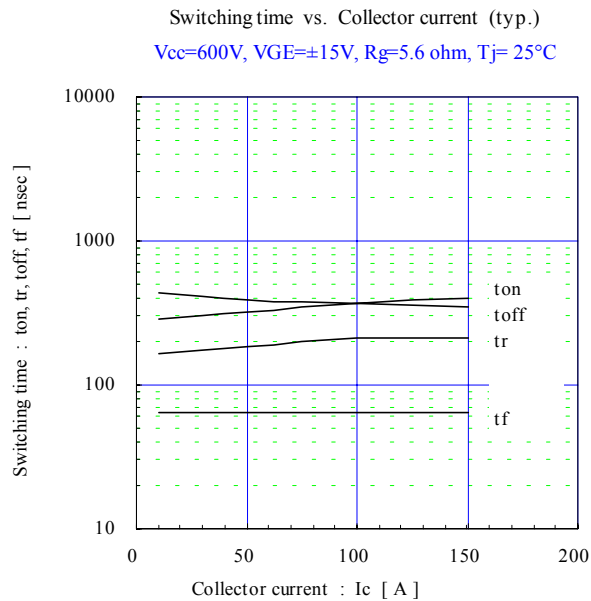
 $T_j = 25^\circ\text{C}$ / chip

Capacitance vs. Collector-Emitter voltage (typ.)

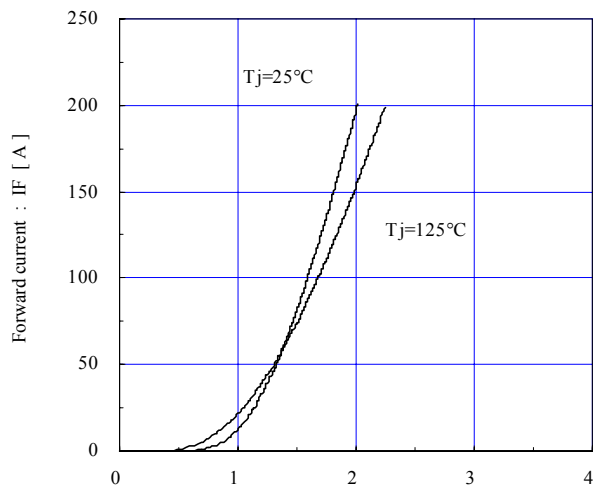
 $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$, $T_j = 25^\circ\text{C}$ 

Dynamic Gate charge (typ.)

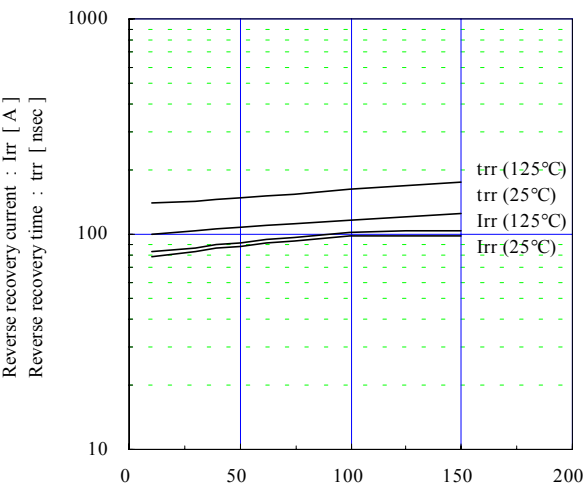
 $V_{cc} = 600\text{V}$, $I_c = 100\text{A}$, $T_j = 25^\circ\text{C}$ 



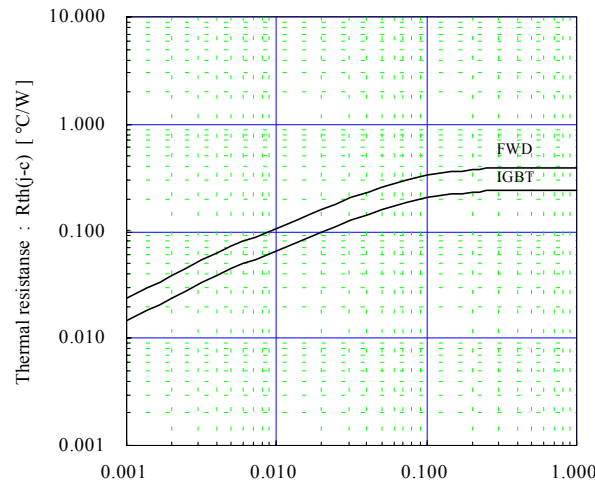
Forward current vs. Forward on voltage (typ.)
chip



Reverse recovery characteristics (typ.)
Vcc=600V, VGE=±15V, Rg=5.6Ω



Transient thermal resistance (max.)



M632

Technical drawing of the M632 component, showing top and side views with dimensions and callouts.

Top View Dimensions:

- Overall width: 122 ± 1
- Overall height: 62 ± 1
- Inner width: 110 ± 0.3
- Inner height: 39.9 ± 0.3
- Top edge dimensions (from left to right): 16.9, $3.81 \times 3 = 11.43$, 11.43, 15.24, $3.81 \times 3 = 11.43$, 19.05, $3.81 \times 3 = 11.43$, 11.5, $+0.5_0$
- Bottom edge dimensions (from left to right): 4.055, 15, 15.24, 15.24, 15.24, 15.24, 15.24, 22.855, $11.5 \pm 0.5_0$
- Left edge dimensions (from top to bottom): 19.69, 22.86, 11.66, 4.21
- Right edge dimensions (from top to bottom): 14.15, 11.5
- Internal dimensions: 3.81, 1.15 ± 0.15 , 0.8 ± 0.15 , 99.6 ± 0.3
- Top edge hole dimensions: 30, 27, 26, 25, 24, 21, 20
- Bottom edge hole dimensions: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

Side View Dimensions:

- Overall height: 20.5 ± 0.5
- Top flange height: 17 ± 0.5
- Top flange thickness: 2.5 ± 0.3
- Bottom flange height: 6.5 ± 0.5
- Bottom flange thickness: 1 ± 0.2
- Top flange width: (3.5)
- Bottom flange width: 1.5 ± 0.3
- Pin height: (0.5)

Callouts:

- 8-R2.25 ± 0.3
- 4- $\phi 5.5 \pm 0.3$
- $\phi 0.4$
- 3.81
- 1.15 ± 0.15
- 0.8 ± 0.15
- 99.6 ± 0.3
- 39.9 ± 0.3
- 11.5 $\pm 0.5_0$
- 11.5 $\pm 0.5_0$
- 1.15 ± 0.2
- 1.5 ± 0.3
- 6.5 ± 0.5
- 17 ± 0.5
- 20.5 ± 0.5
- 3.81
- 15.24
- 15.24
- 15.24
- 15.24
- 15.24
- 22.855
- 4.055
- 4.21
- 11.66
- 22.86
- 19.69
- 30
- 27
- 26
- 25
- 24
- 21
- 20
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

■ Equivalent Circuit Schematic

