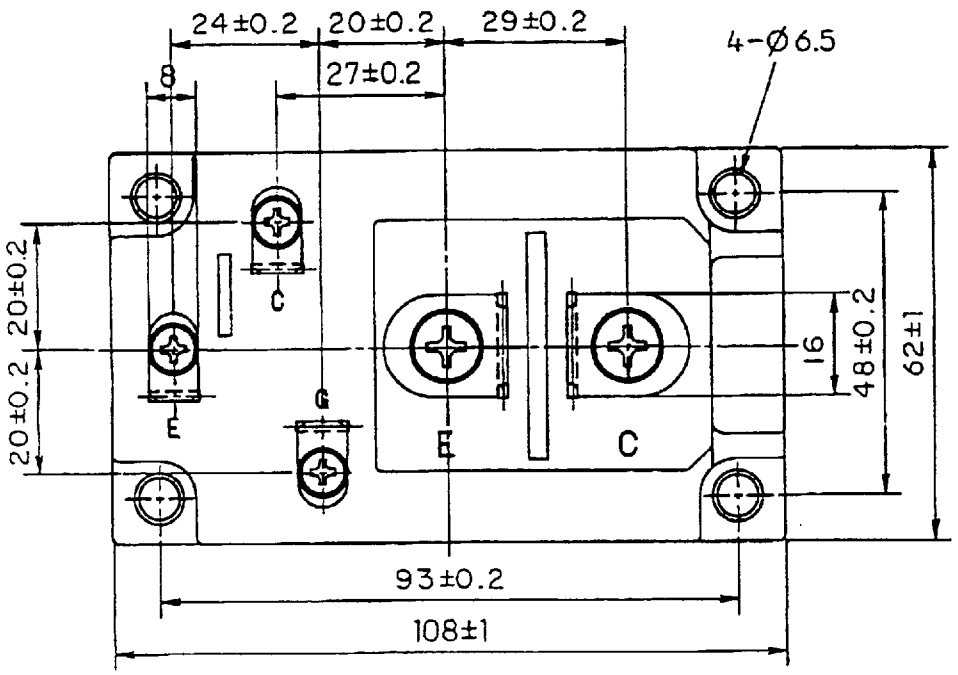
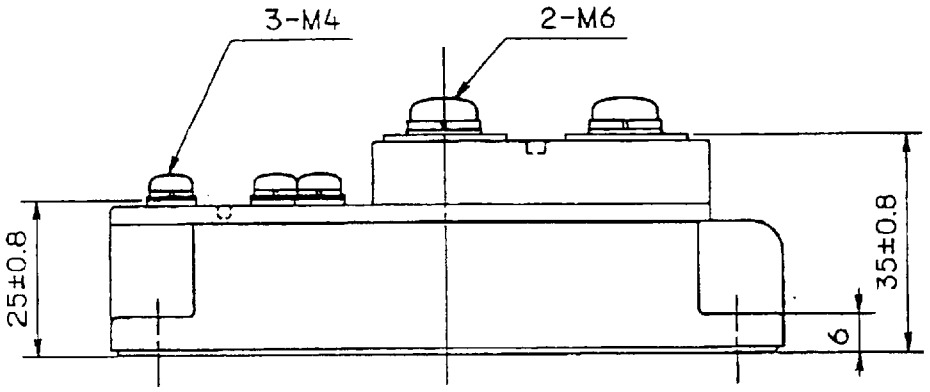
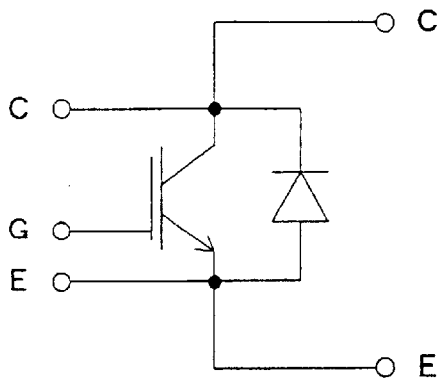
Target Specification of 1MBI400SA-120

1. Outline Drawing (Unit : mm)





2. Equivalent circuit



	DATE	NAME	APPROVED
DRAWN	Feb - 11 - 99	N Arikawa	
CHECKED	Feb - 11 - 99	S. Kyotta	T. Miyata

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3. Absolute Maximum Ratings (at Tc= 25℃ unless otherwise specified)

Items	Symbols	Conditions		Maximum Ratings	Units
Collector-Emitter voltage	VCES			1200	V
Gate-Emitter voltage	VGES			±20	V
Collector current	Ic	Continuous	Tc=25℃	600	A
			Tc=80℃	400	
	Ic pulse	1ms	Tc=25℃	1200	
			Tc=80℃	800	
	-Ic			400	
	-Ic pulse	1ms		800	
Collector Power Dissipation	Pc	1 device		2500	W
Junction temperature	Tj			150	℃
Storage temperature	Tstg			-40～ +125	℃
Isolation voltage (*1)	Viso	AC : 1min.		2500	V
Screw Torque	Mounting (*2)			3.5	N・m
	Terminals (*3)			4.5	
	Terminals (*4)			1.7	

(*1) All terminals should be connected together when isolation test will be done.
(*2) Recommendable Value : 2.5～3.5 N・m (M5) or (M6)
(*3) Recommendable Value : 3.5～4.5 N・m (M6)
(*4) Recommendable Value : 1.3～1.7 N・m (M4)

4. Electrical characteristics (at Tj= 25℃ unless otherwise specified)

Items	Symbols	Conditions		Characteristics min.	Characteristics typ.	Characteristics Max.	Units
Zero gate voltage Collector current	ICES	VGE = 0 V, VCE = 1200 V				4.0	mA
Gate-Emitter leakage current	IGES	VCE = 0 V, VGE = ±20 V				0.8	μA
Gate-Emitter threshold voltage	VGE(th)	VCE = 20 V, Ic = 400 mA		5.5	7.2	8.5	V
Collector-Emitter saturation voltage	VCE(sat)	VGE = 15 V	Tj = 25 ℃		2.3	2.6	V
		Ic = 400 A	Tj = 125 ℃		2.8		
Input capacitance	Cies	VGE = 0 V			48000		pF
Output capacitance	Coes	VCE = 10 V			10000		
Reverse transfer capacitance	Cres	f = 1 MHz			8800		
Turn-on time	ton	Vcc = 600 V				1.2	μs
	tr	Ic = 400 A				0.6	
	tr(i)	VGE = ±15 V			0.1		
Turn-off time	toff	RG = 1.8 Ω				1.0	
	tf				0.08	0.3	
Forward on voltage	VF	IF = 400 A	Tj = 25 ℃		2.4	3.3	V
			Tj = 125 ℃		2.0		
Reverse recovery time	trr	IF = 400 A				0.35	μs

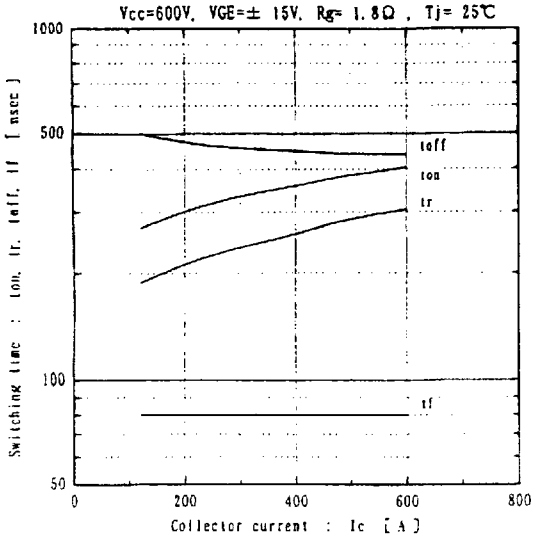
5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics min.	Characteristics typ.	Characteristics Max.	Units
Thermal resistance (1 device)	Rth(j-c)	IGBT			0.050	℃/W
		FWD			0.160	
Contact Thermal resistance	Rth(c-f)	with Thermal Compound (※)		0.0125		

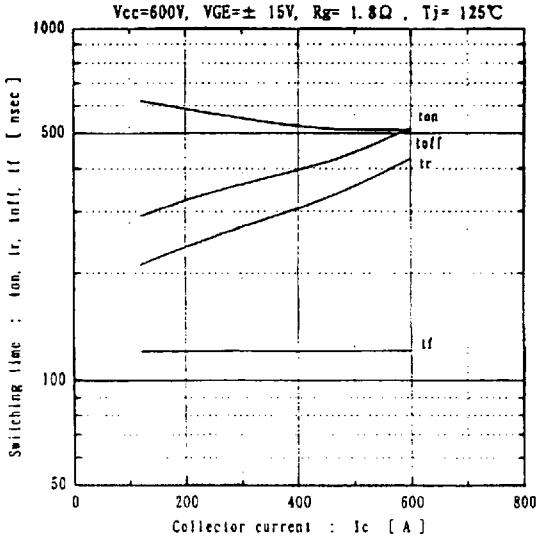
※ This is the value which is defined mounting on the additional cooling fin with thermal compound.

Note :
- *This specification is only for technical considerations, and not for contract.*
- *This specification is subject to be changed without notices.*

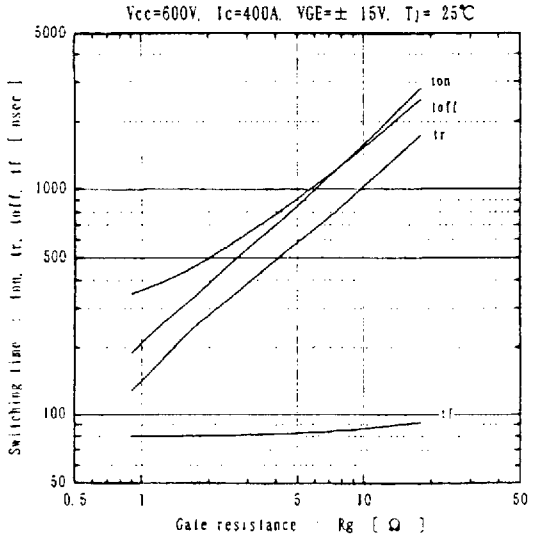
Switching time vs. Collector current (typ.)
Vcc=600V, VGE=± 15V, Rg= 1.8Ω , Tj= 25℃



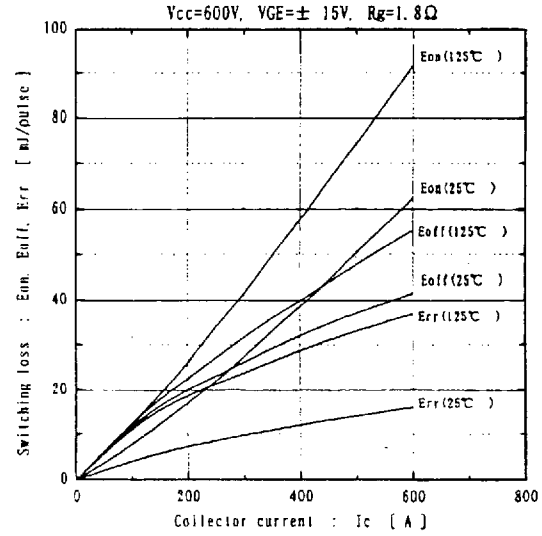
Switching time vs. Collector current (typ.)
Vcc=600V, VGE=± 15V, Rg= 1.8Ω , Tj= 125℃



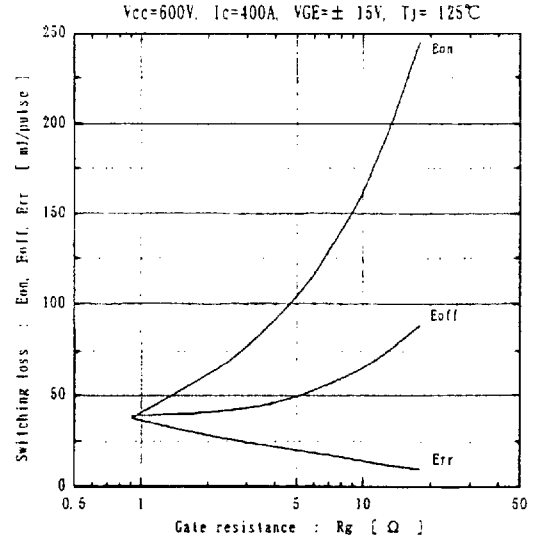
Switching time vs. Gate resistance (typ.)
Vcc=600V, Ic=400A, VGE=± 15V, Tj= 25℃



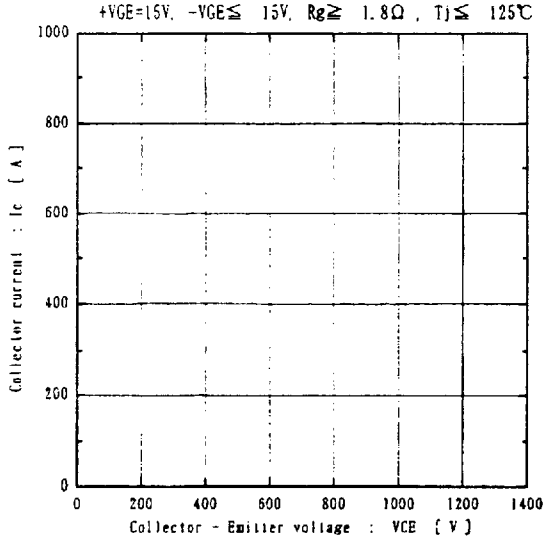
Switching loss vs. Collector current (typ.)
Vcc=600V, VGE=± 15V, Rg=1.8Ω



Switching loss vs. Gate resistance (typ.)
Vcc=600V, Ic=400A, VGE=± 15V, Tj= 125℃



Reverse bias safe operating area
+VGE=15V, -VGE≦ 15V, Rg≧ 1.8Ω , Tj≦ 125℃



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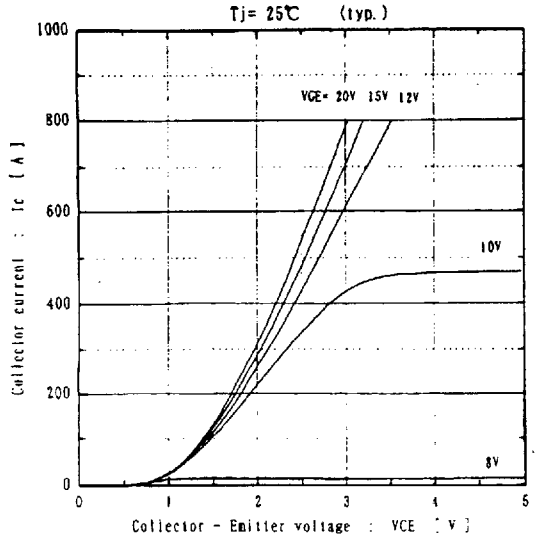
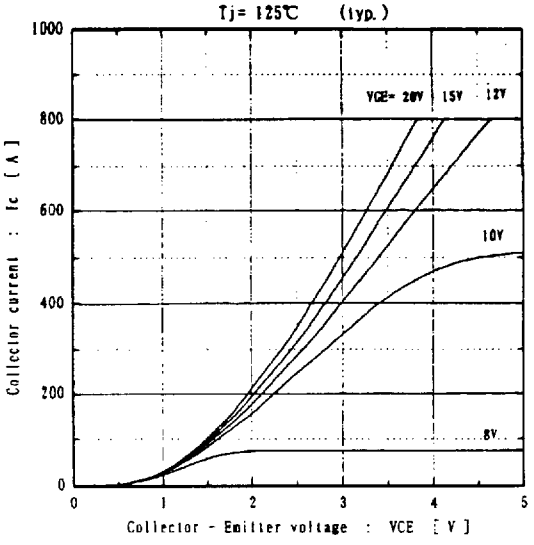
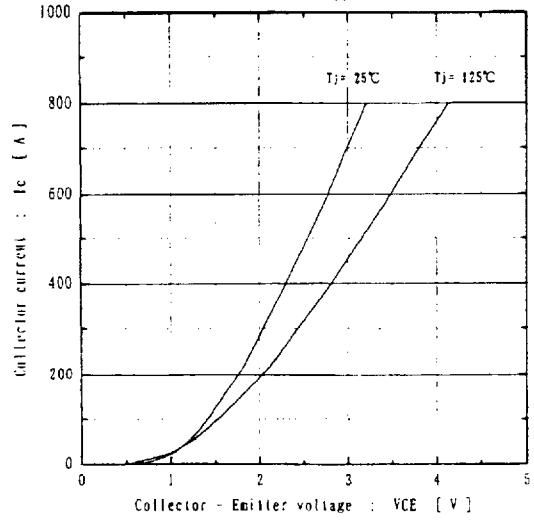
Collector current vs. Collector-Emitter voltage
Tj= 25℃ (typ.)



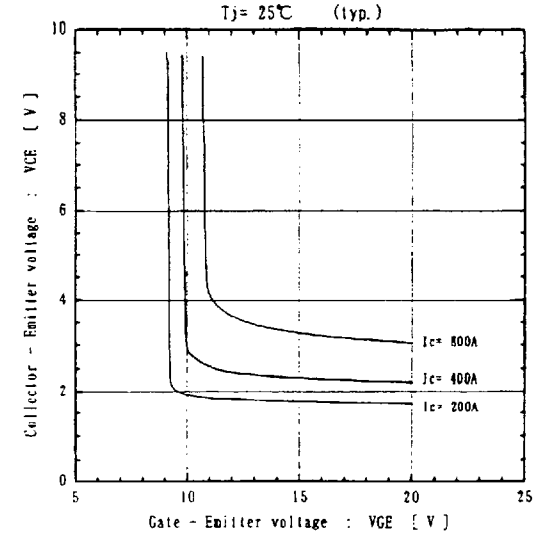
Collector current vs. Collector-Emitter voltage
Tj= 125℃ (typ.)



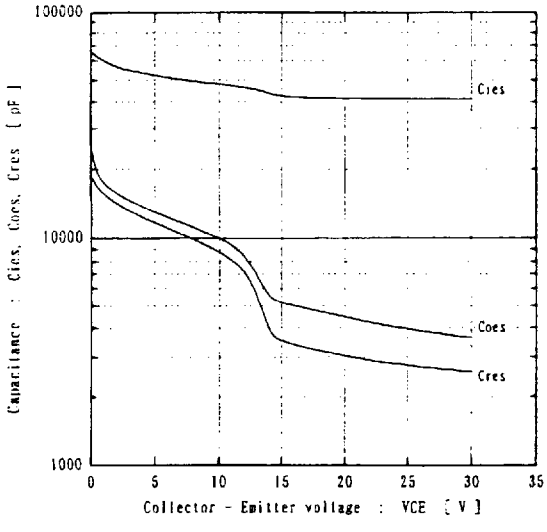
Collector current vs. Collector-Emitter voltage
VGE=15V (typ.)



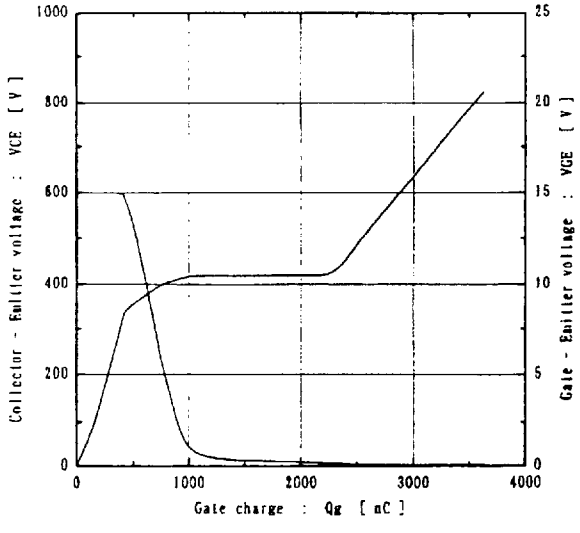
Collector-Emitter voltage vs. Gate-Emitter voltage
Tj= 25℃ (typ.)



Capacitance vs. Collector-Emitter voltage (typ.)
VGE=0V, f= 1MHz, Tj= 25℃



Dynamic Gate charge (typ.)
Vcc=600V, Ic=400A, Tj= 25℃



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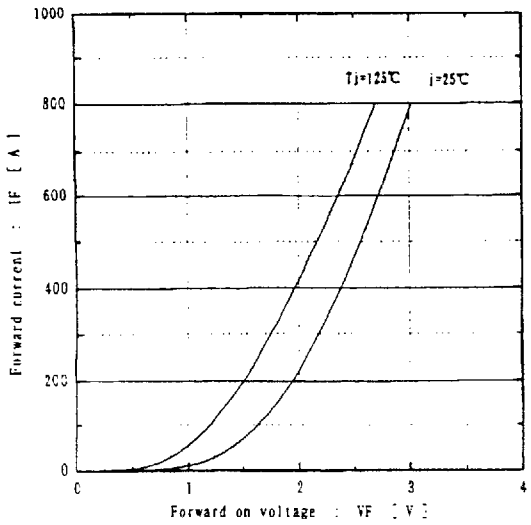
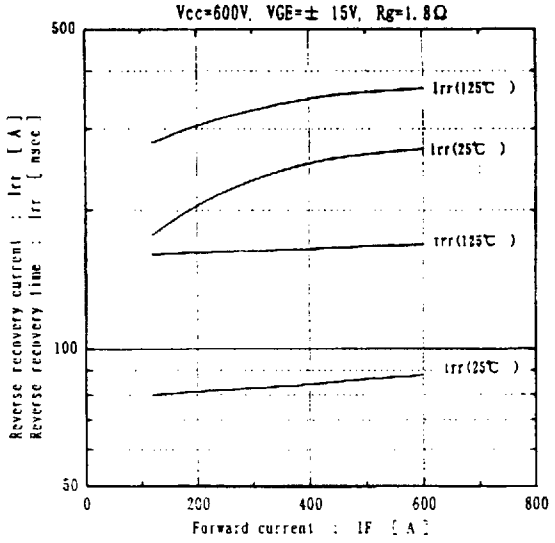
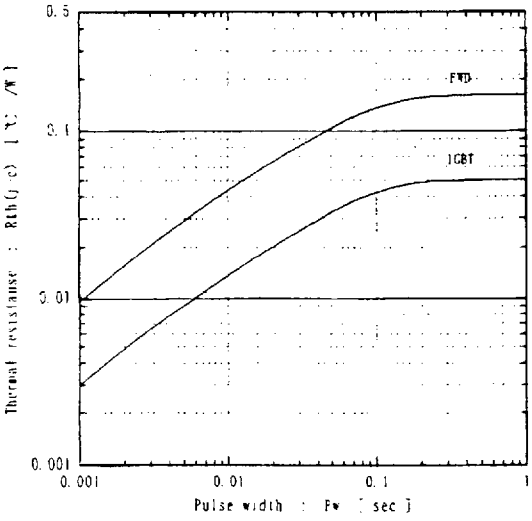
Forward current vs. Forward on voltage (typ.)



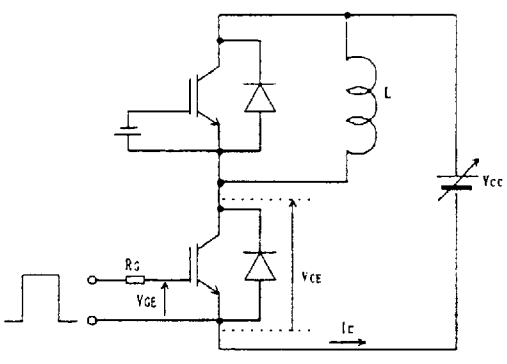
Reverse recovery characteristics (typ.)
Vcc=600V, VGE=± 15V, Rg=1.8Ω

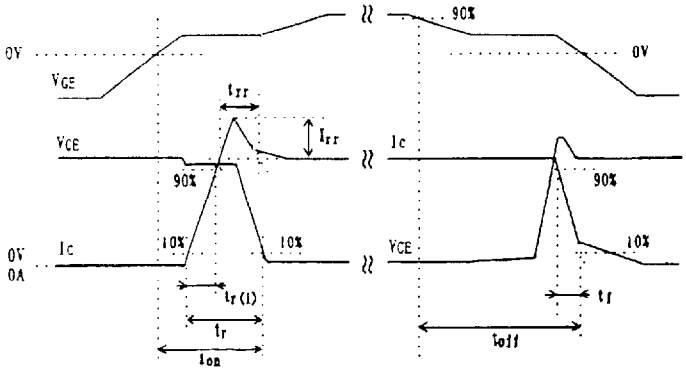


Transient thermal resistance



Definitions of switching time





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