

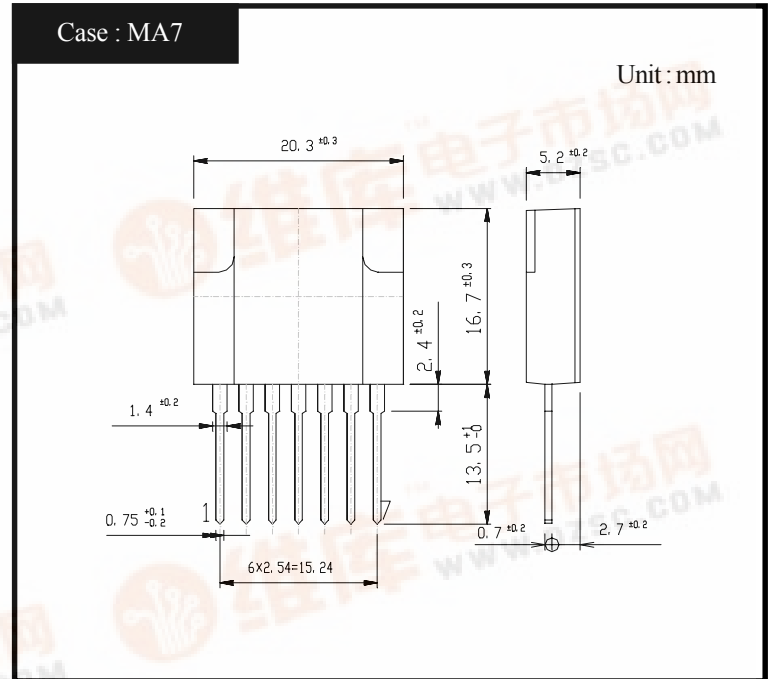
# SHINDENGEN

## Power Switching Regulators

MA1000 Series

# MA1050

### OUTLINE DIMENSIONS



### RATINGS

●Absolute Maximum Ratings

Item	Symbol	Conditions	Ratings		Unit
			P Class	N Class	
Storage Temperature	Tstg		-30~125	-30~125	°C
Operating Temperature	Top	Case Temperature	-20~125	-20~125	°C
Junction Temperature	Tj		150	150	°C
Peak Input Voltage	Vin	②+,④-,Fig.1 is Measurement Circuit of Peak Input Voltage Vin and Collector Cutoff Current I <sub>CEX</sub> .	850	850	V
Input Current	Iin	Pulse Pulse Width 150 μs MAX, Duty1/2, Sawtooth Wave, Peak Value, ②+,④-	6	6	A
Maximum Operating Frequency	f(max)		200	200	kHz
Maximum Power Dissipation	P <sub>D</sub>	Ta=25°C	3	3	W
	P <sub>D</sub>	Heatsink Tc=100°C	20	20	W
Dielectric Strength	Vdis	Terminals To Case AC 1 min	2	2	kV
Insulation Resistance		Terminals To Case 500VDC	100	100	MΩ
Fold Back Control Voltage	V <sub>CONT(max)</sub>	Fold Control Resistance=0Ω Duty 1/2, ④,⑦	±8	±8	V
Fold Back Control Current	I <sub>CONT(max)</sub>	④-,⑥+	100	100	mA

●Electrical Characteristics (Tc=25°C)

Item	Symbol	Conditions	Ratings		Unit
			P Class	N Class	
Q1	Collector Cutoff Current	I <sub>CEX</sub> V <sub>CE</sub> =850V, Fig.1 is Measurement Circuit of Peak Input Voltage Vin and Collector Cutoff Current I <sub>CEX</sub> . ②+,④-	MAX 0.1	MAX 0.1	mA
	DC Current Gain	h <sub>FE</sub> V <sub>CE</sub> = 5V, I <sub>C</sub> = 1.5A, ②+,④-,⑤I <sub>B</sub>	13~26	8~16	
	Collector to Emitter Saturation Voltage	V <sub>CE(sat)</sub> I <sub>C</sub> =1.5A, I <sub>B</sub> =0.3A, ②+,④-,⑤I <sub>B</sub>	MAX 1.0	MAX 1.0	V
D1	Thermal Resistance	θ <sub>jc</sub> Junction to Case	MAX 2.5	MAX 2.5	°C/W
	Reverse Current	I <sub>R</sub> V <sub>R</sub> =800V,①+,②-	MAX 10	MAX 10	μA
	Forward Voltage	V <sub>F</sub> I <sub>F</sub> =0.6A,①-,②+	MAX 1.7	MAX 1.7	V
Driving Saturation Voltage	V <sub>D(sat)</sub>	I <sub>C</sub> =1.5A, I <sub>B</sub> =0.3A, ⑤+,④-	MIN 1.7	MIN 1.7	V
			MAX 2.3	MAX 2.3	



● Standard Operating Condition • Design Standard For Application Circuit

Item	Conditions	Ratings		Unit
		P Class	N Class	
Input Rated Voltage		AC90~274	AC90~274	V
Output Nominal Wattage		24	24	W
Output Nominal Voltage		12	12	V
Output Nominal Current		2	2	A

● Standard Operating Condition • Standard Operating Characteristics (Ta=25°C)

Item	Conditions	Ratings		Unit		
		P Class	N Class			
Minimum Input Full Load Output Voltage	Vin=90V, I <sub>O</sub> =2A	12.0±0.6	12.0±0.6	V	Fig 2, ① Refer	
Maximum Input Light Load Output Voltage	Vin=274V, I <sub>O</sub> =0.2A	12.0±0.6	12.0±0.6	V	Fig 2, ② Refer	
AC Input Voltage	I <sub>O</sub> =2A	MAX 85	MAX 85	V		
Over Current Protection	Foldback Current	Vin=274V, V <sub>O</sub> =10V	MAX 3.5	MAX 3.5	A	Fig 2, ③ Refer
	Short Circuit	Vin=274V, R <sub>O</sub> =0.5Ω	Nodamage To Any Device, Automatic Recovery.		-	Fig 2, ④ Refer
Output Ripple Noise	Vin=90~274V, I <sub>O</sub> =0.2~2A	MAX 150	MAX 150	mV P-P		

Figure in ○=Terminal Sign

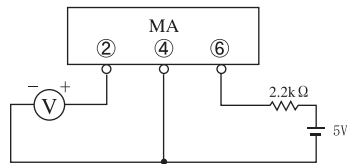


Fig1. Measurement Circuit

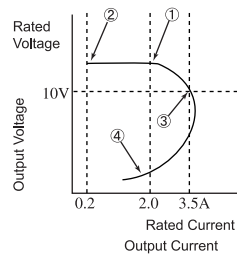
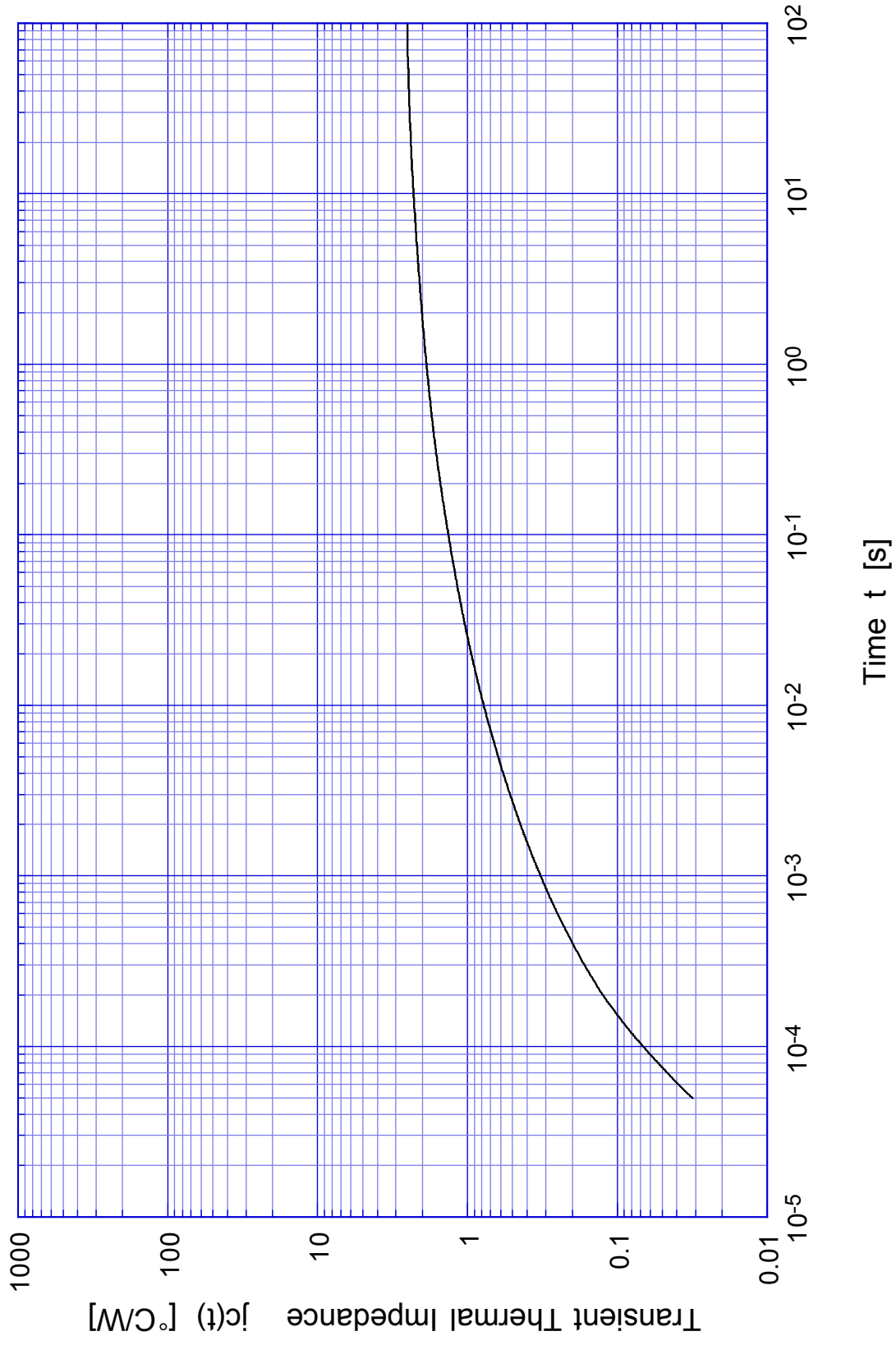


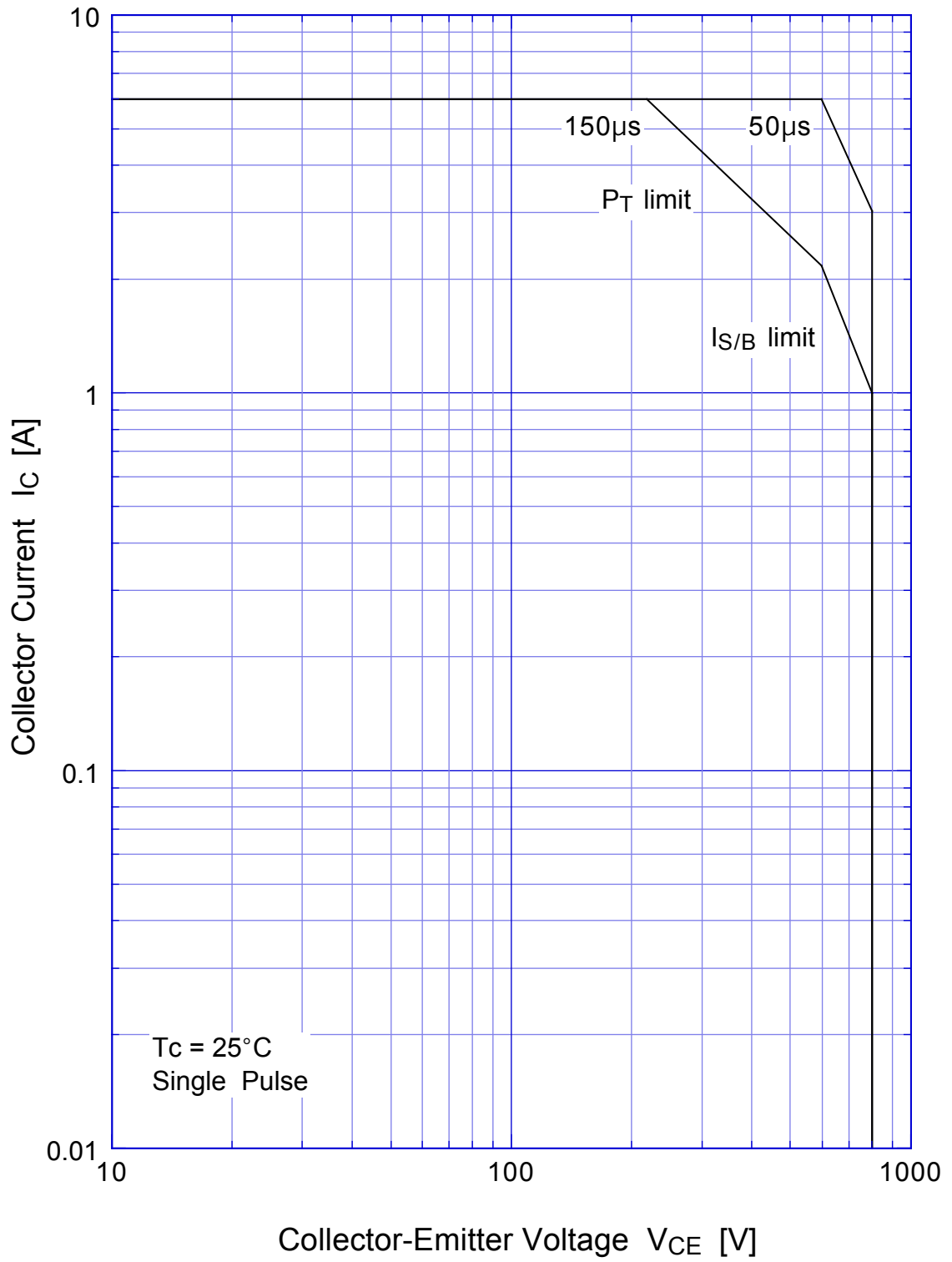
Fig2. Output Voltage/Current

# MA1050 Transient Thermal Impedance



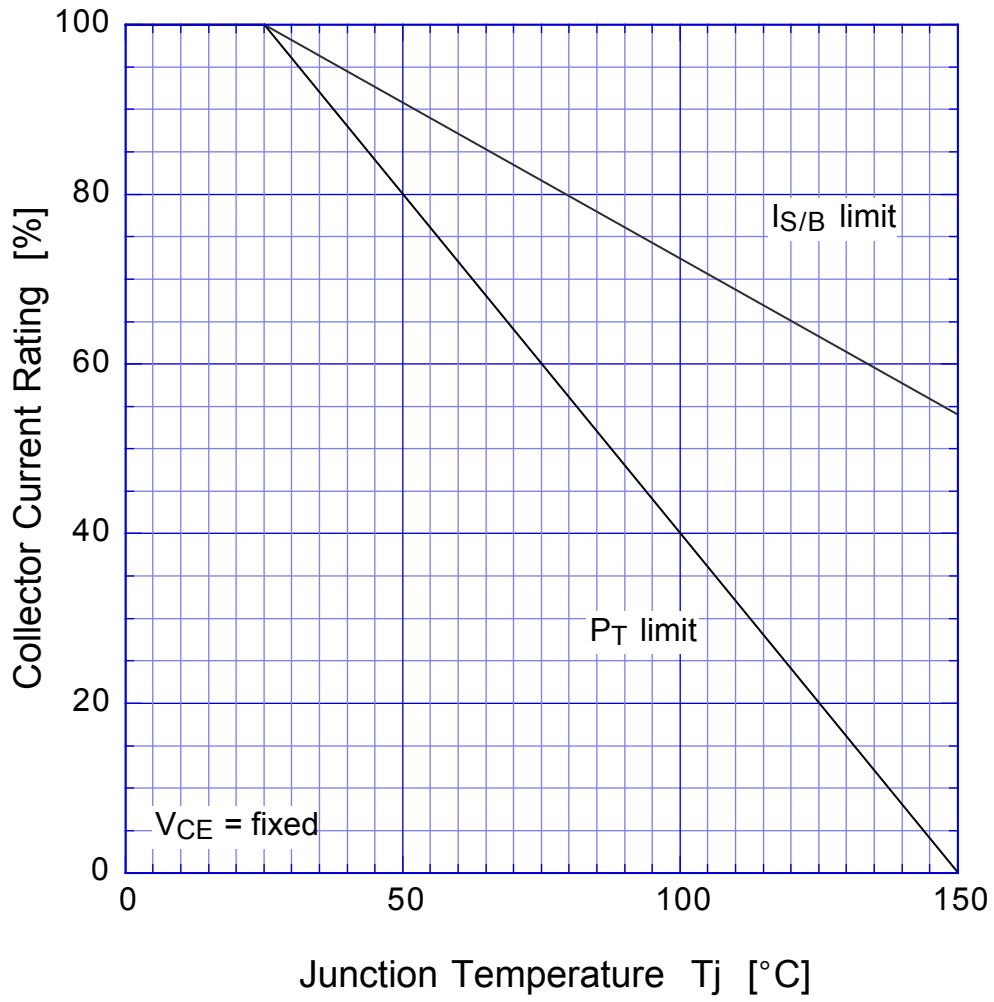
MA1050

Forward Bias SOA



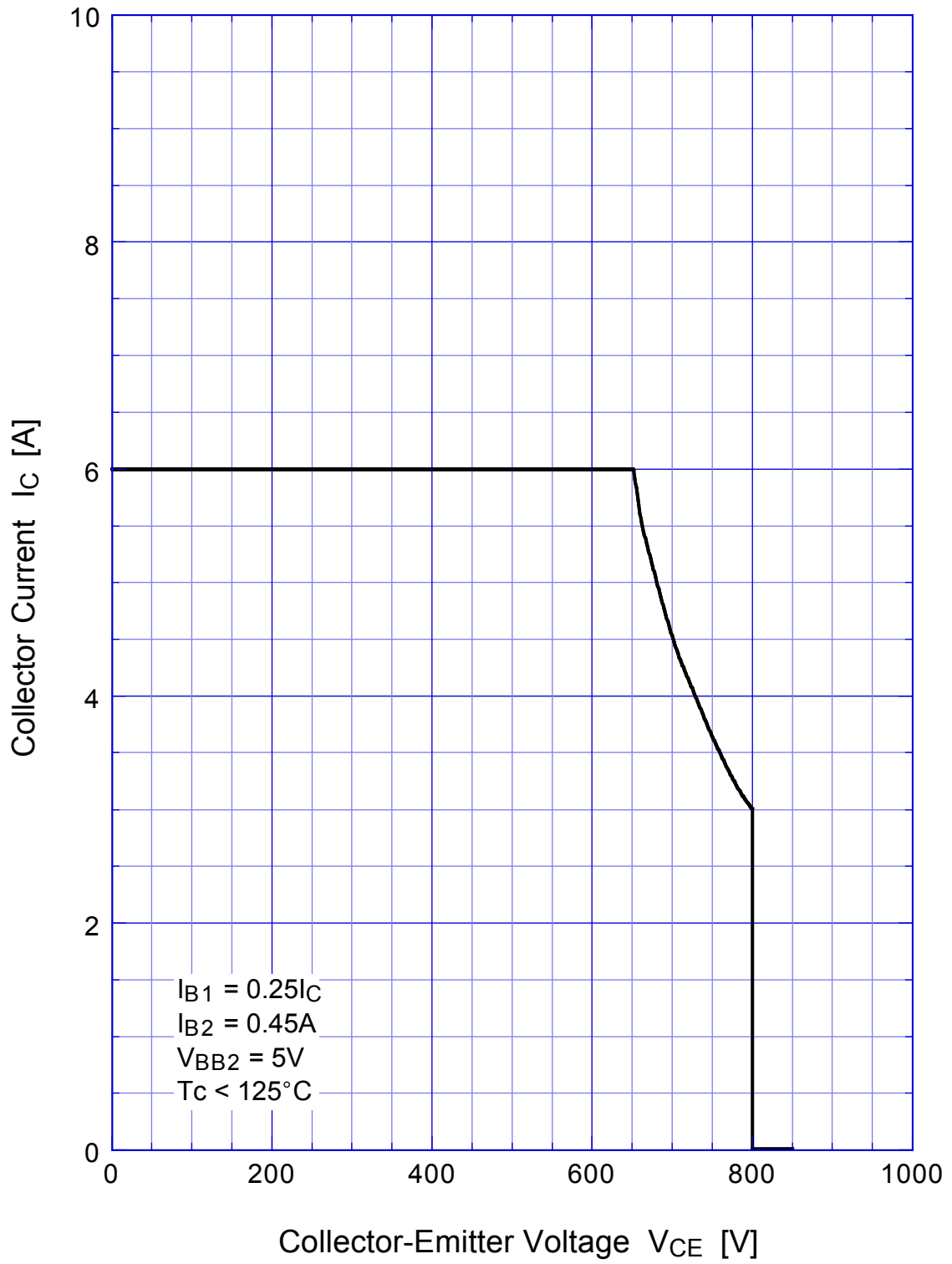
# MA1050

## Collector Current Derating



MA1050

Reverse Bias SOA



MA1050

$h_{FE} - I_C$

