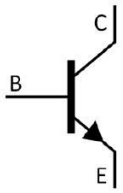
■ PRODUCT CHARACTERISTICS

BVCBO	700V
BVCEO	400V
HFE@5V1A	10-40
IC	1.5A

Symbol



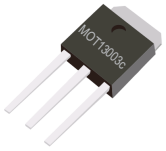
■ FEATURES

* Inductive switching matrix 0.5 ~ 1.5 Amp, 25 and 100°C
  Typical tc = 290ns @ 1A, 100°C.
* 700V blocking capability

■ APPLICATIONS

* Switching regulator's, inverters
* Motor controls
* Solenoid/Relay drivers
* Deflection circuits

TO-252



TO-251

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT13003C	TO-251	70 pieces/Tube
N/A	MOT13003D	TO-252	2500 pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER			SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage			$V_{CEO(SUS)}$	400	V
Collector-Emitter Voltage (V_{BE}=0)			V_{CES}	700	V
Collector-Base Voltage			V_{CBO}	700	V
Emitter Base Voltage			V_{EBO}	9	V
Collector Current		Continuous	I_C	1.5	A
		Peak (1)	I_{CM}	3	
Base Current		Continuous	I_B	0.75	A
		Peak (1)	I_{BM}	1.5	
Emitter Current		Continuous	I_E	2.25	A
		Peak (1)	I_{EM}	4.5	
Total Power Dissipation	T_A=25°C	TO-251/TO-252	P_D	1.56	W
	T_C=25°C	TO-251/TO-252		25	W
Junction Temperature			T_J	+150	°C
Storage Temperature			T_{STG}	-55 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

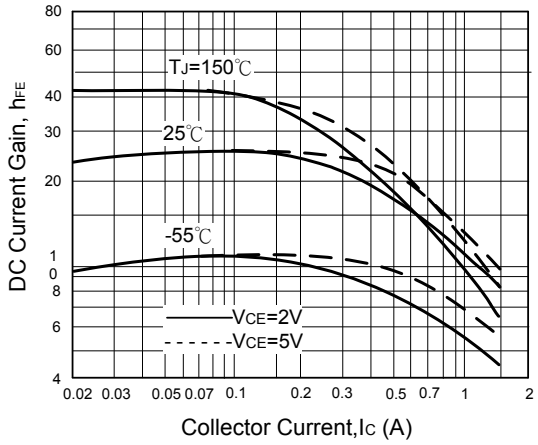
■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS (Note)							
Collector-Emitter Sustaining Voltage		$V_{CEO(SUS)}$	I_C=10 mA , I_B=0	400			V
Collector Cutoff Current	T_C=25°C	I_{CEO}	V_{CEO}=Rated Value,			1	mA
	T_C=100°C		$V_{BE(OFF)}$=1.5 V			5	
Emitter Cutoff Current		I_{EBO}	V_{EB}=9 V, I_C=0			1	mA
SECOND BREAKDOWN							
Second Breakdown Collector Current with bass forward biased		Is/b		See Fig.5			
Clamped Inductive SOA with base reverse biased		RB_{SOA}		See Fig.6			
ON CHARACTERISTICS (Note)							
DC Current Gain		h_{FE1}	I_C=0.4A, V_{CE}=5V	14		32	
		h_{FE2}	I_C=1A, V_{CE}=5V	5		30	
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	I_C=0.5A, I_B=0.1A			0.5	V
			I_C=1A, I_B=0.25A			1	
			I_C=1.2A, I_B=0.4A			3	
			I_C=1A, I_B=0.25A, T_C=100°C			1	
Base-Emitter Saturation Voltage		$V_{BE(SAT)}$	I_C=0.5A, I_B=0.1A			1	V
			I_C=1A, I_B=0.25A			1.2	
			I_C=1A, I_B=0.25A, T_C=100°C			1.1	
DYNAMIC CHARACTERISTICS							
Current-Gain-Bandwidth Product		f_T	I_C=100mA, V_{CE}=10V, f=1MHz	4	10		MHz
Output Capacitance		C_{OB}	V_{CB}=10V, I_E=0, f=0.1MHz		21		pF
SWITCHING CHARACTERISTICS							
Resistive Load (Table 1)							
Delay Time		t_D	V_{CC}=125V, I_C=1A, I_{B1}=I_{B2}=0.2A, t_P=25μs, Duty Cycle≤1%		0.05	0.1	μs
Rise Time		t_R			0.5	1	μs
Storage Time		t_S			2	4	μs
Fall Time		t_F			0.4	0.7	μs
Inductive Load, Clamped (Table 1)							
Storage Time		t_{STG}	I_C=1A, Vclamp=300V, I_{B1}=0.2A, $V_{BE(OFF)}$=5Vdc, T_C=100°C		1.7	4	μs
Crossover Time		t_C			0.29	0.75	μs
Fall Time		t_F			0.15		μs

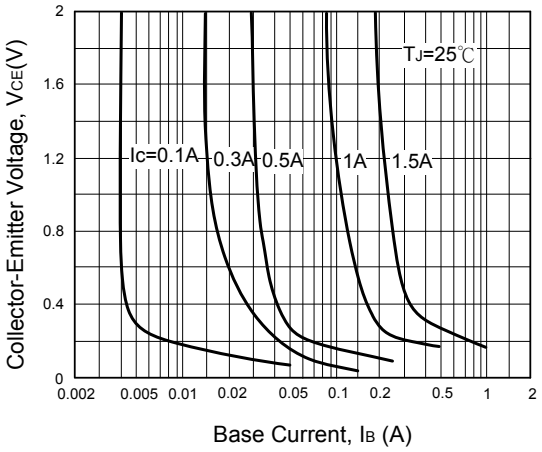
Note: Pulse Test : PW=300μ ≤2%

■ TYPICAL CHARACTERISTICS

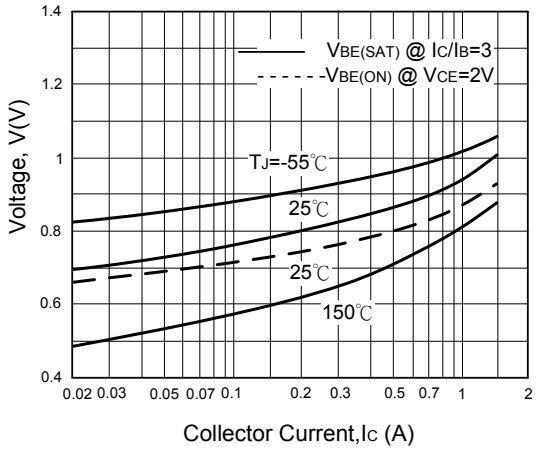
DC Current Gain



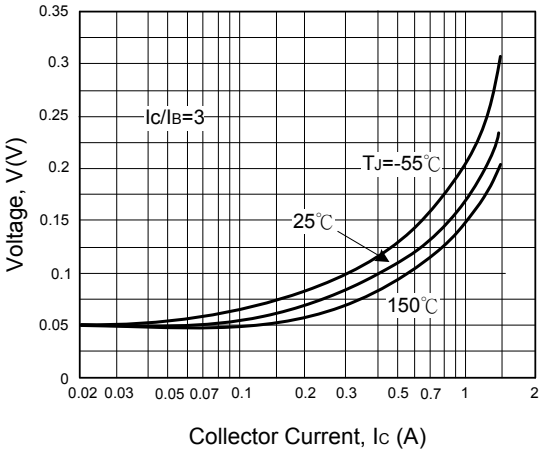
Collector Saturation Region



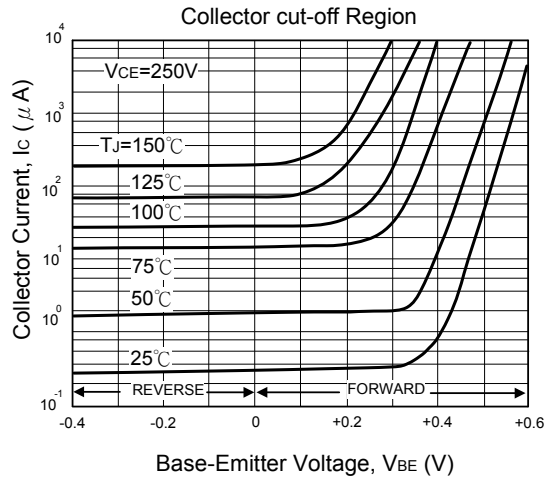
Base-Emitter Voltage



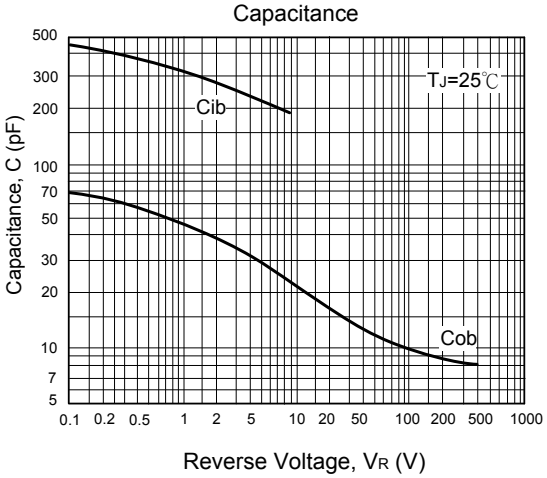
Collector-Emitter Saturation Region



Collector cut-off Region



Capacitance



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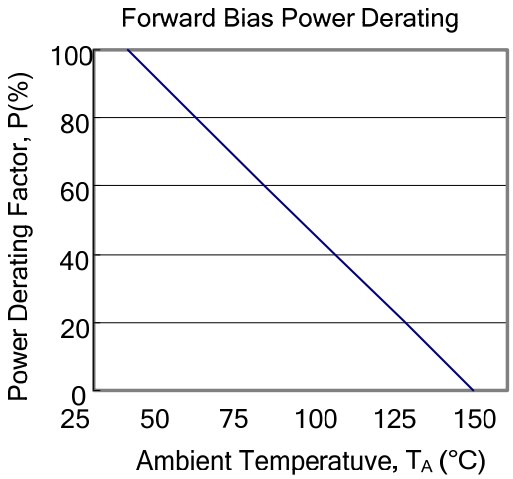
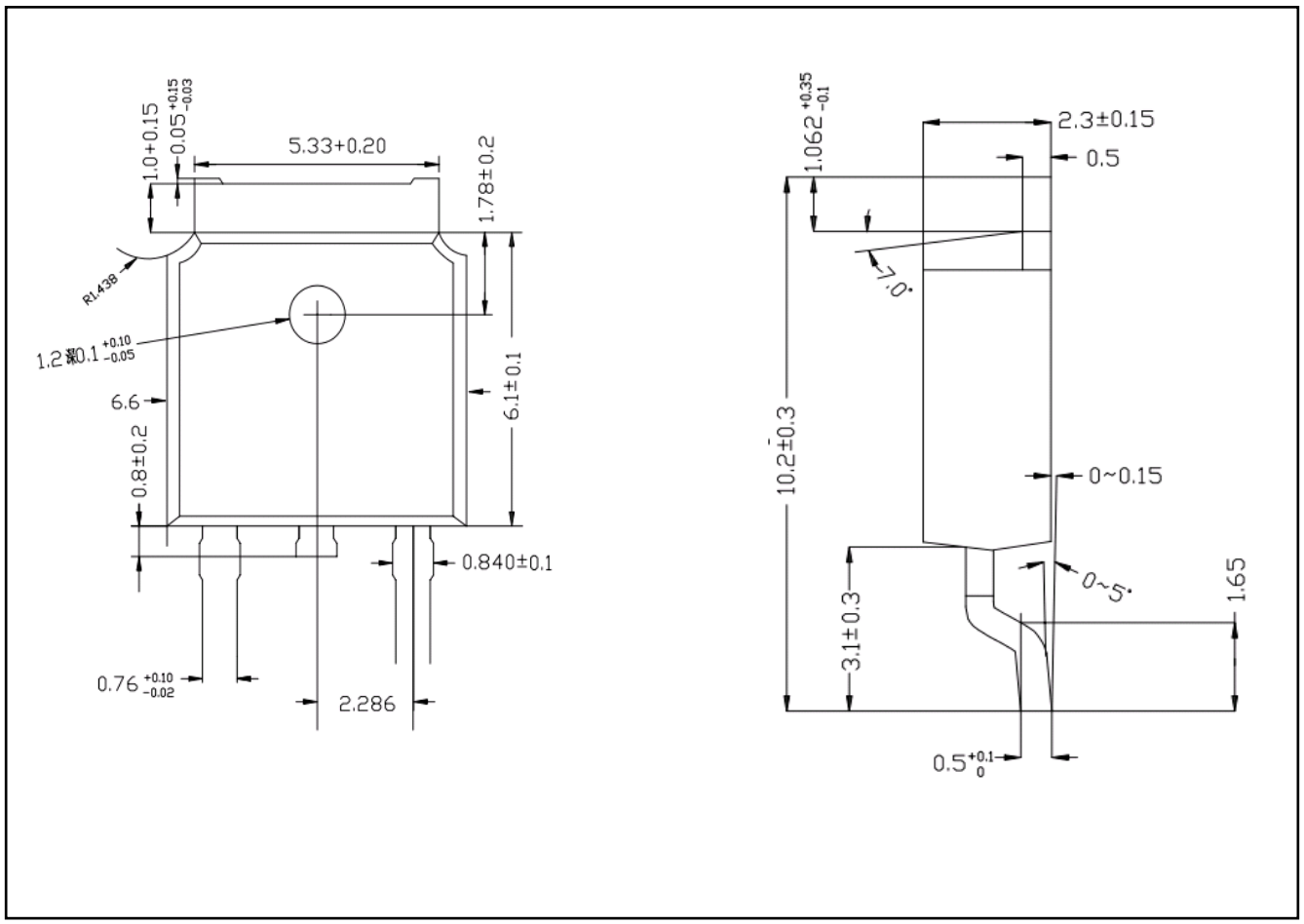
■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-252-2L PACKAGE OUTLINE DIMENSIONS



■ TO-251-3L PACKAGE OUTLINE DIMENSIONS