

■ PRODUCT CHARACTERISTICS

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

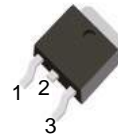
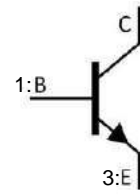
■ FEATURES

- * Inductive switching matrix 0.5 ~ 1.5 Amp, 25 and 100°C
Typical $t_c = 290\text{ns}$ @ 1A, 100°C.
- * 700V blocking capability

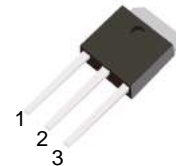
■ APPLICATIONS

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

Symbol



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	$T_A=25^\circ\text{C}$	P_D	TO-251/TO-252	1.56	W
	$T_C=25^\circ\text{C}$		TO-251/TO-252	25	W
Junction Temperature		T_J	+150	°C	
Storage Temperature		T_{STG}	-55 ~ +150	°C	

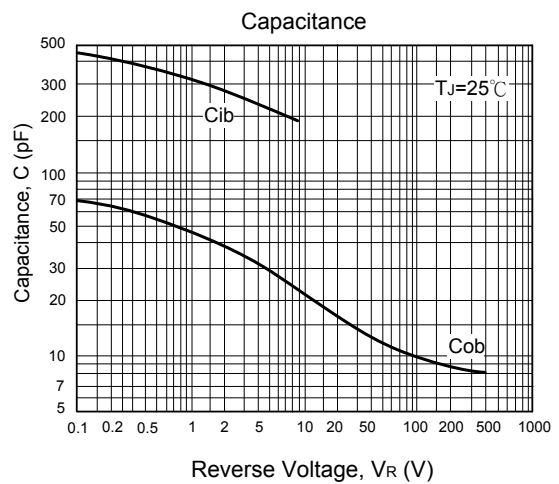
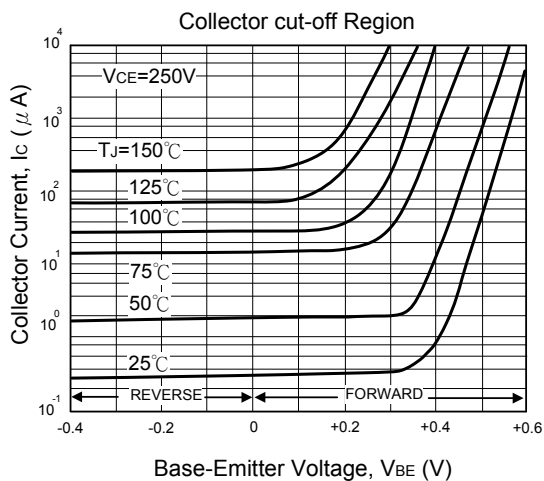
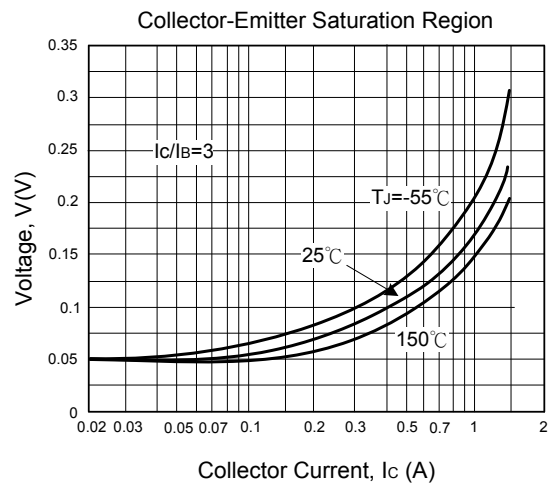
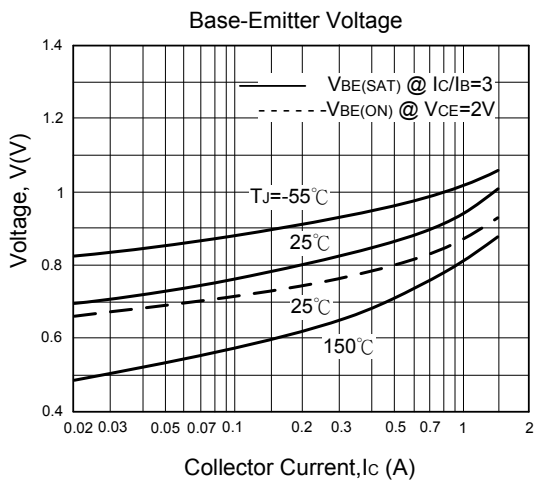
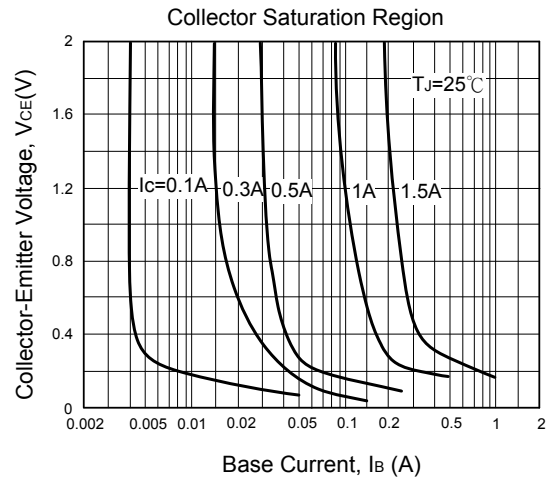
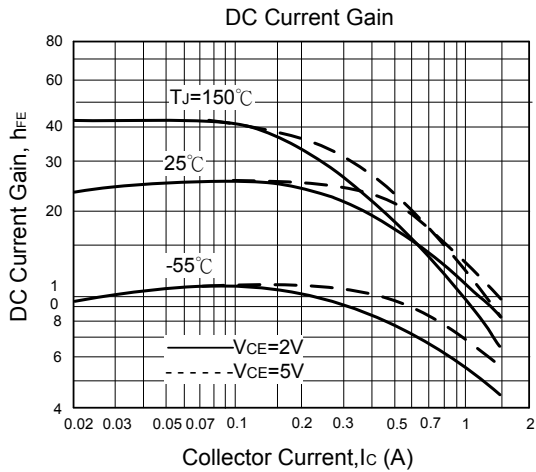
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise noted)

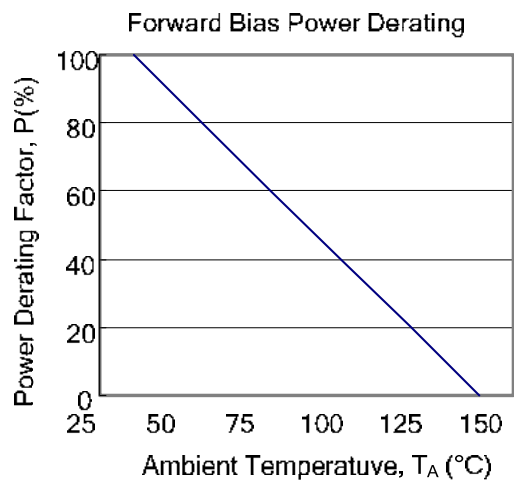
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS (Note)							
Collector-Emitter Sustaining Voltage	$V_{CEO(SUS)}$	$I_C=10\text{ mA}, I_B=0$	400	-	-	V	
Collector Cutoff Current	I_{CEO}	$V_{CEO}=\text{Rated Value},$ $V_{BE(OFF)}=1.5\text{ V}$	$T_C=25^\circ\text{C}$	-	-	1	mA
			$T_C=100^\circ\text{C}$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

Note: Pulse Test : $PW=300\mu\text{s}\leq 2\%$

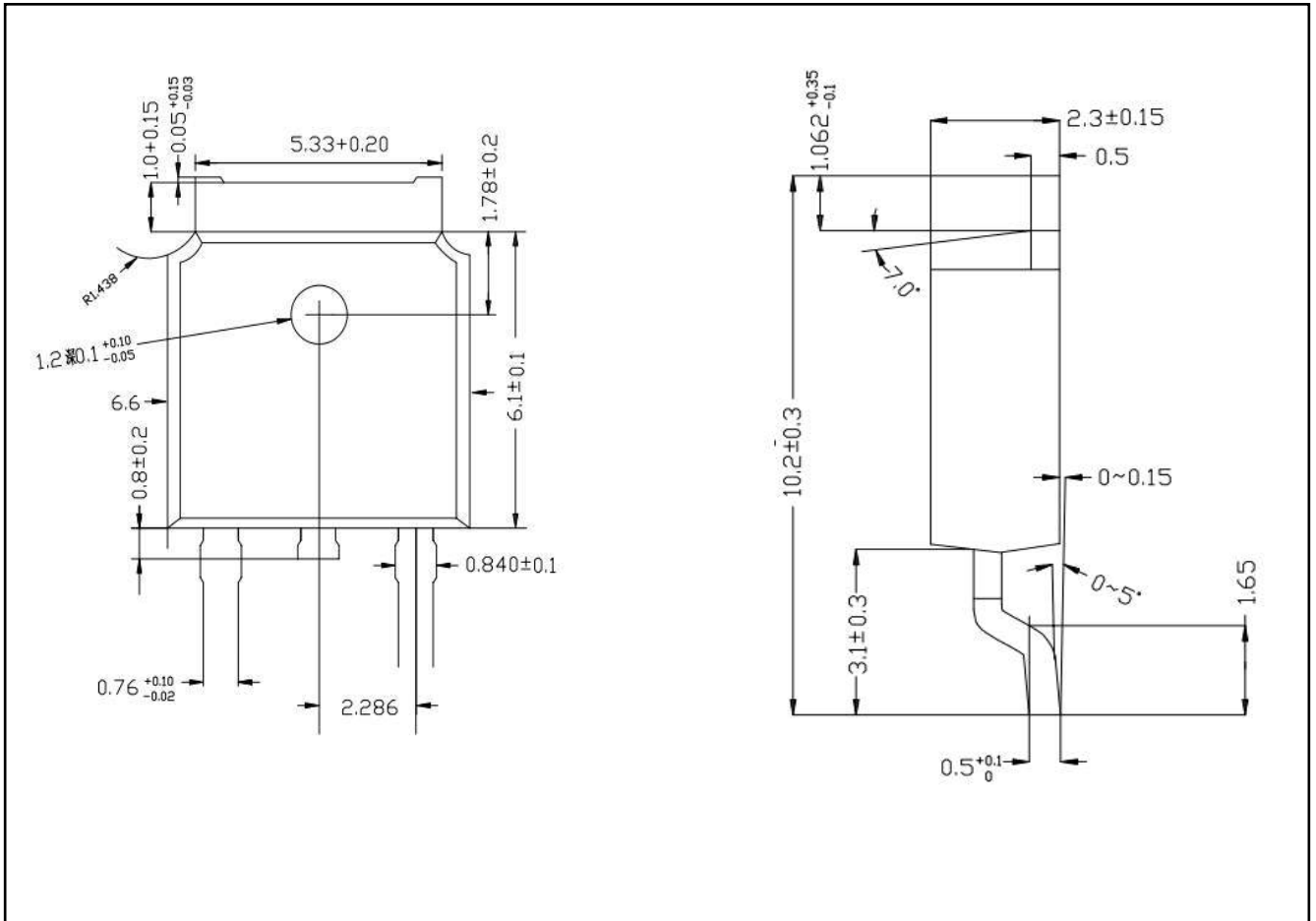
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-252-2L PACKAGE OUTLINE DIMENSIONS



■ TO-251-3L PACKAGE OUTLINE DIMENSIONS

