

■ PRODUCT CHARACTERISTICS

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

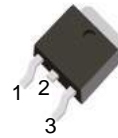
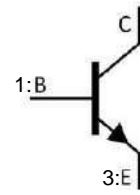
■ FEATURES

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

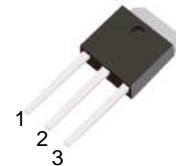
■ APPLICATIONS

- \* 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	$T_A=25^\circ\text{C}$	TO-251/TO-252	$P_D$ 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

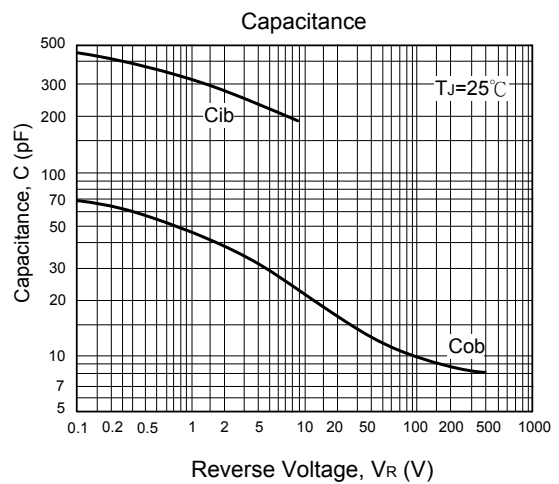
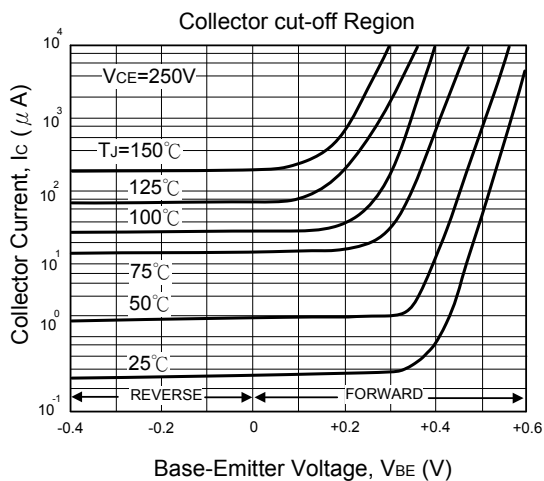
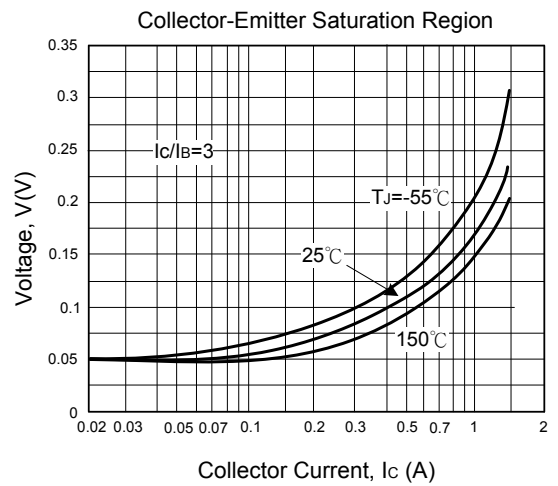
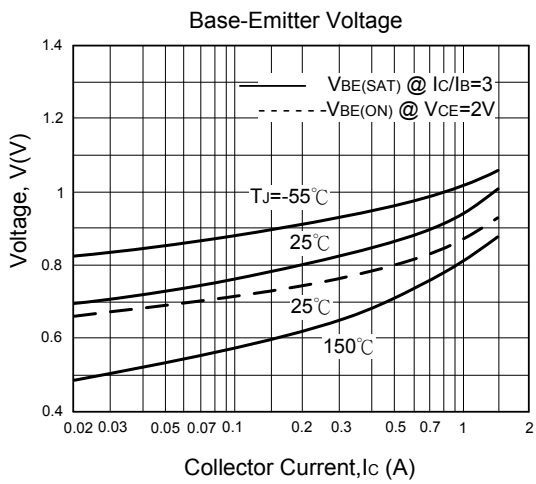
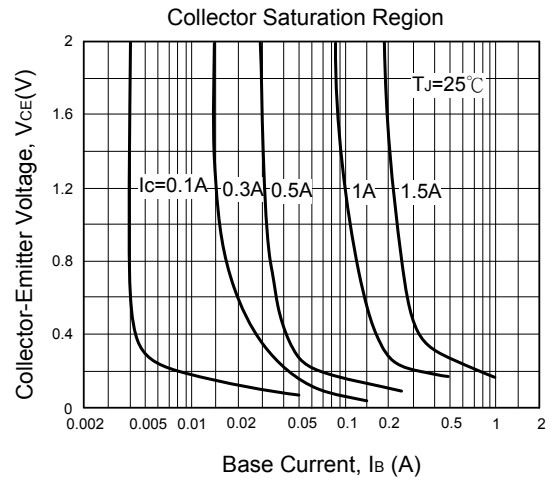
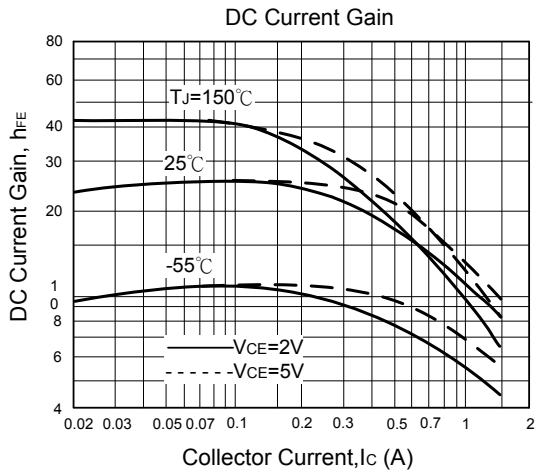
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

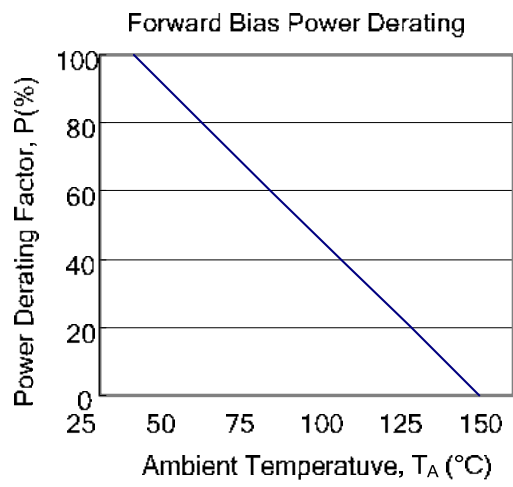
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
<b>OFF CHARACTERISTICS (Note)</b>							
Collector-Emitter Sustaining Voltage	$V_{CEO(SUS)}$	$I_C=10\text{ mA}, I_B=0$	400	-	-	V	
Collector Cutoff Current	$I_{CEO}$	$V_{CEO}=\text{Rated Value},$ $V_{BE(OFF)}=1.5\text{ V}$	$T_C=25^\circ\text{C}$	-	-	1	mA
			$T_C=100^\circ\text{C}$	-	-	5	
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=9\text{ V}, I_C=0$	-	-	1	mA	
<b>SECOND BREAKDOWN</b>							
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				
<b>ON CHARACTERISTICS (Note)</b>							
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		
<b>DYNAMIC CHARACTERISTICS</b>							
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	
<b>SWITCHING CHARACTERISTICS</b>							
<b>Resistive Load (Table 1)</b>							
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	$\mu\text{s}$	
Rise Time	$t_R$		-	0.5	1	$\mu\text{s}$	
Storage Time	$t_S$		-	2	4	$\mu\text{s}$	
Fall Time	$t_F$		-	0.4	0.7	$\mu\text{s}$	
<b>Inductive Load, Clamped (Table 1)</b>							
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	$\mu\text{s}$	
Crossover Time	$t_C$		-	0.29	0.75	$\mu\text{s}$	
Fall Time	$t_F$		-	0.15		$\mu\text{s}$	

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

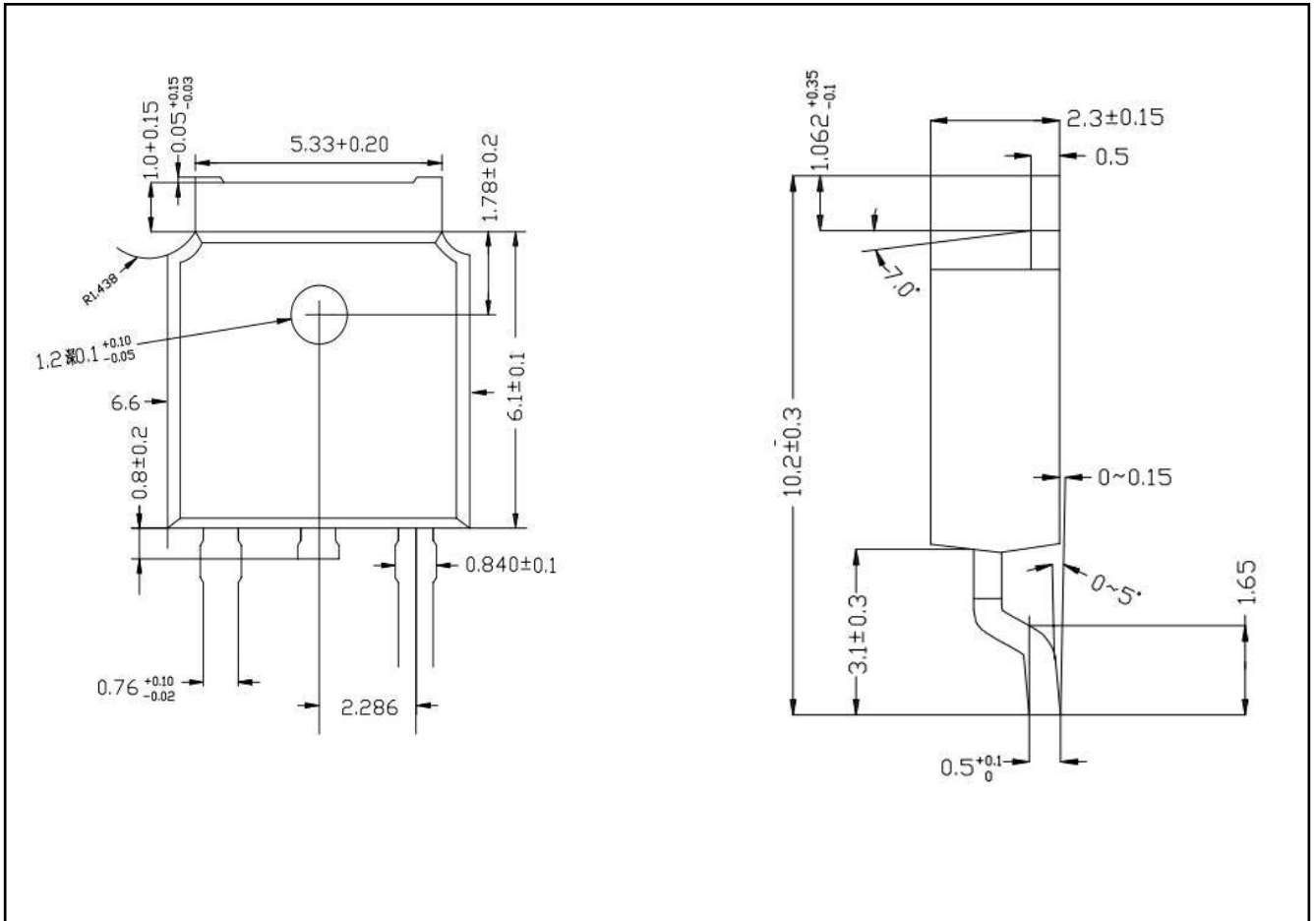
■ TYPICAL CHARACTERISTICS



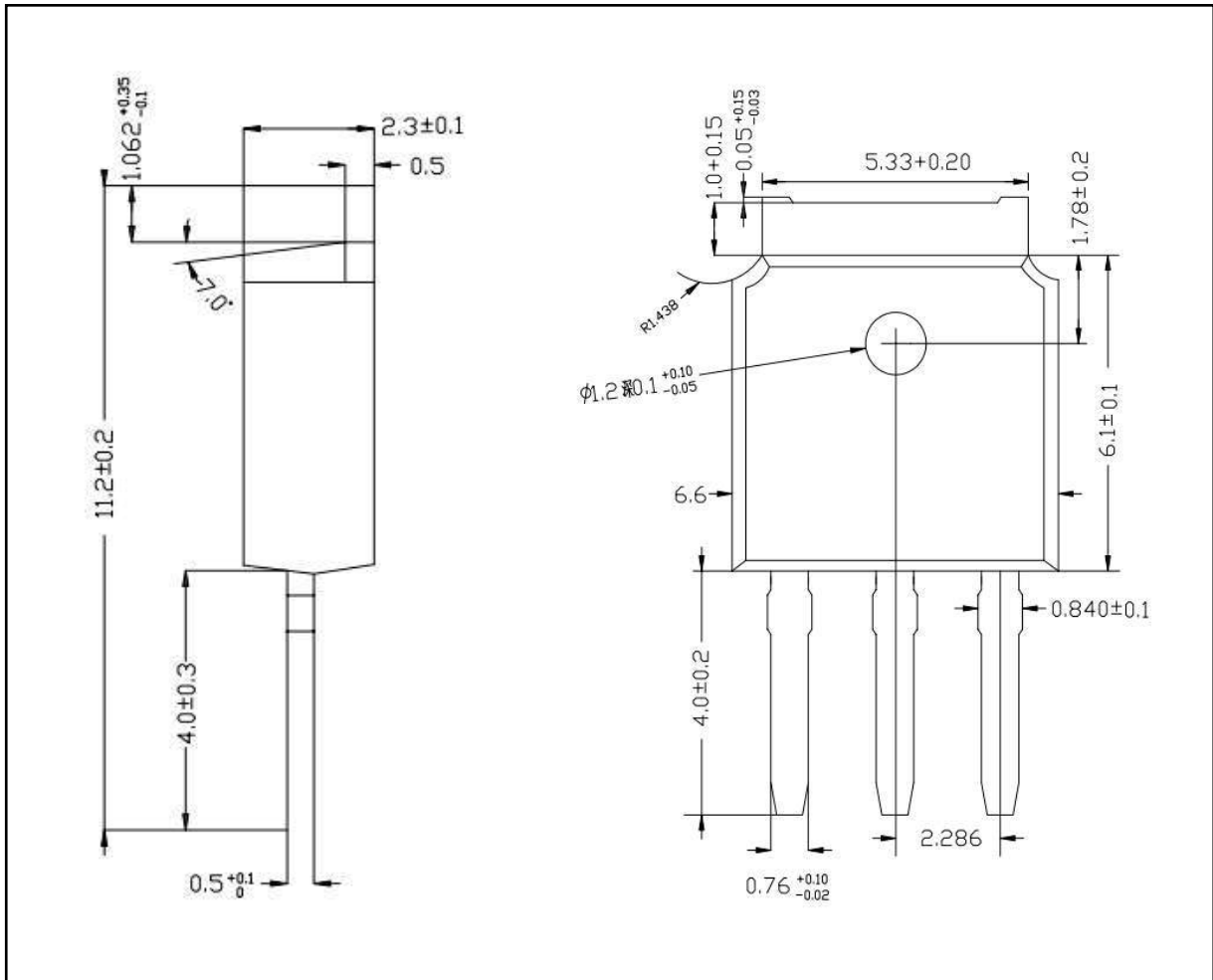
■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-252-2L PACKAGE OUTLINE DIMENSIONS



■ TO-251-3L PACKAGE OUTLINE DIMENSIONS



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