

PRODUCT CHARACTERISTICS

BVCBO	700V
BVCEO	400V
HFE@5V2A	8-40
IC	12A

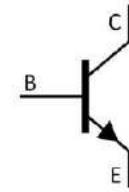
APPLICATIONS

- Fluorescent lamp
- Electronic ballast
- Electronic transformer
- Switch mode power supply

FEATURES

- * $V_{CEQ(SUS)}$ 400V
- * 700V Blocking Capability

Symbol



TO-247

ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT13009LW	TO-247S	30 pieces/Tube

ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V _{CEO}	400	V
Collector-Emitter Voltage (V _{BE} =-1.5V)		V _{CEV}	700	V
Emitter Base Voltage		V _{EBO}	9	V
Collector Current	Continuous	I _C	12	A
	Peak	I _{CM}	24	A
Base Current	Continuous	I _B	6	A
	Peak	I _{BM}	12	A
Emitter Current	Continuous	I _E	18	A
	Peak	I _{EM}	36	A
Power Dissipation		P _D	80	W
Derate above 25℃			640	mW/℃
Junction Temperature		T _J	+150	℃
Storage Temperature		T _{STG}	-40 ~ +150	℃

THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	21	°C/W
Junction to Case	θ_{JC}	1.55	°C/W

■ 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}	I _C = 10mA, I _B = 0	400	-	-	V
Collector Cutoff Current	I _{CEV}	V _{BE(OFF)} = 1.5V _{DC}	-	-	1	mA
V _{CBO} =Rated Value		V _{BE(OFF)} = 1.5V _{DC} , T _C = 100°C	-	-	5	
Emitter Cutoff Current	I _{EBO}	V _{EB} = 9V _{DC} , I _C = 0	-	-	1	mA
ON CHARACTERISTICS (Note)						
DC Current Gain	h _{FE1}	I _C = 5A, V _{CE} = 5V	-	-	40	
	h _{FE 2}	I _C = 8A, V _{CE} = 5V	-	-	30	
Current-Emitter Saturation Voltage	V _{CE(SAT)}	I _C = 5A, I _B = 1A	-	-	1	V
		I _C = 8A, I _B = 1.6A	-	-	1.5	V
		I _C = 12A, I _B = 3A	-	-	3	V
		I _C = 8A, I _B = 1.6A, T _C = 100°C	-	-	2	V
Base-Emitter Saturation Voltage	V _{BE(SAT)}	I _C = 5A, I _B = 1A	-	-	1.2	V
		I _C = 8A, I _B = 1.6A	-	-	1.6	V
		I _C = 8A, I _B = 1.6A, T _C = 100°C	-	-	1.5	V
DYNAMIC CHARACTERISTICS						
Transition frequency	f _T	I _C = 500mA, V _{CE} = 10V, f = 1MHz	4	-	-	MHz
Output Capacitance	C _{OB}	V _{CB} = 10V, I _E = 0, f = 0.1MHz	-	180	-	pF
SWITCHING CHARACTERISTICS (Resistive Load, Table 1)						
Delay Time	t _{DLY}	V _{CC} = 125Vdc, I _C = 8A I _{B1} = I _{B2} = 1.6A, t _P = 25µs Duty Cycle ≤1%	-	0.06	0.1	µs
Rise Time	t _R		-	0.45	1	µs
Storage Time	t _S		-	1.3	3	µs
Fall Time	t _F		-	0.2	0.7	µs
Inductive Load, Clamped (Table 1, Fig. 13)						
Voltage Storage Time	t _S	I _C =8A, V _{CLAMP} =300V, I _{B1} =1.6A	-	0.92	2.3	µs
Crossover Time	t _C	V _{BE(OFF)} = 5V, T _C = 100°C	-	0.12	0.7	µs

Note: Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2%

■ TYPICAL CHARACTERISTICS

Fig. 1 Forward Bias Safe Operating Area

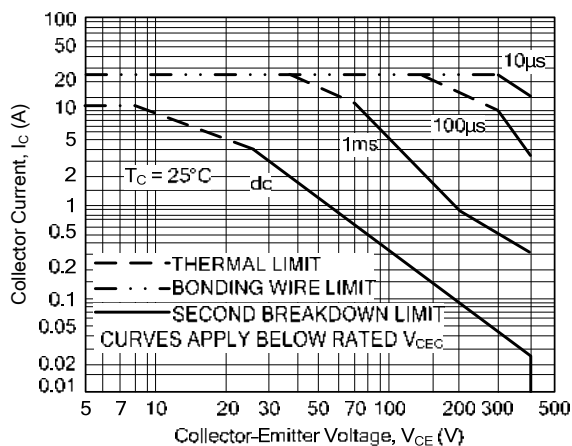


Fig. 2 Reverse Bias Switching Safe Operating Area

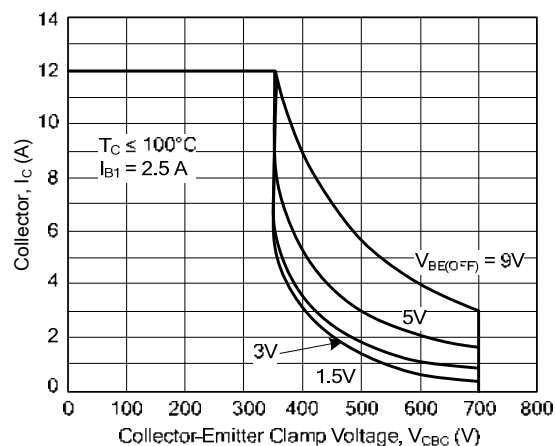


Fig. 3 Forward Bias Power Derating

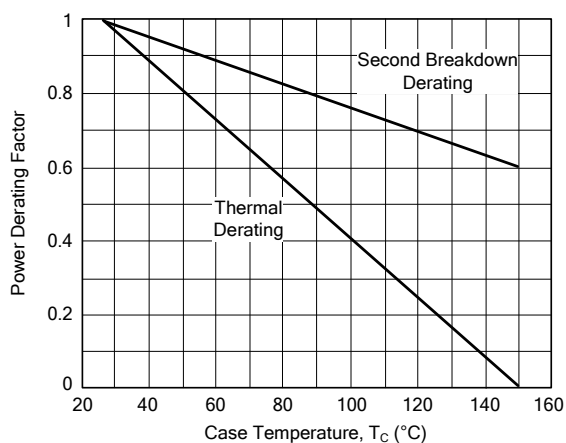
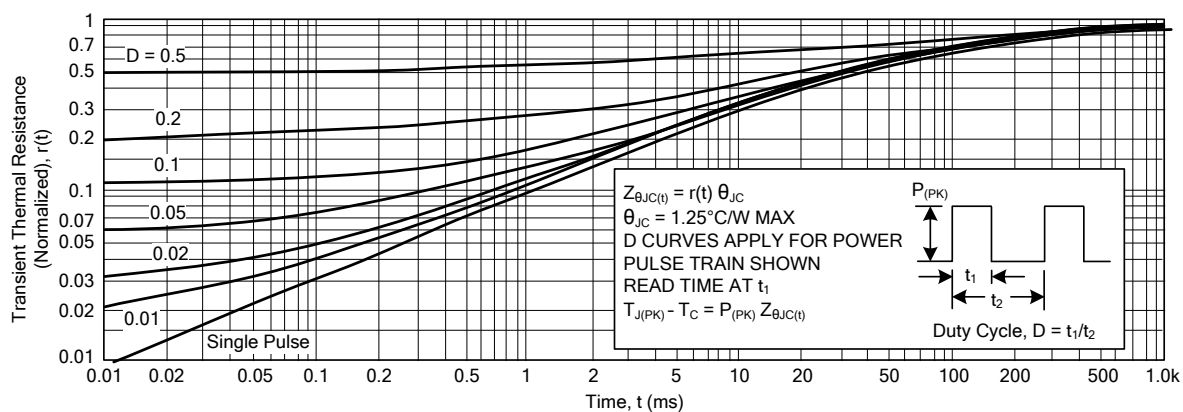


Fig. 4 Typical Thermal Response [$Z_{\theta JC}(t)$]



■ TYPICAL CHARACTERISTICS(Cont.)

Fig. 5 DC Current Gain

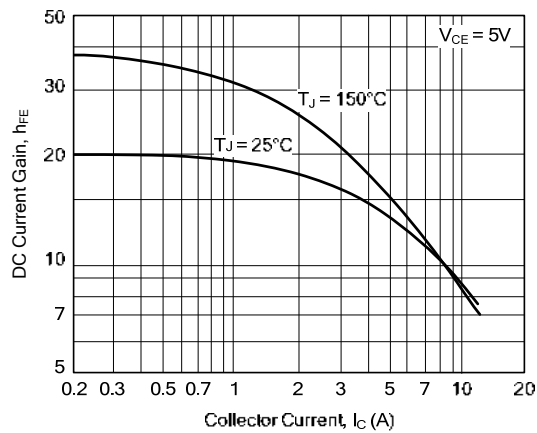


Fig. 6 Collector Saturation Region

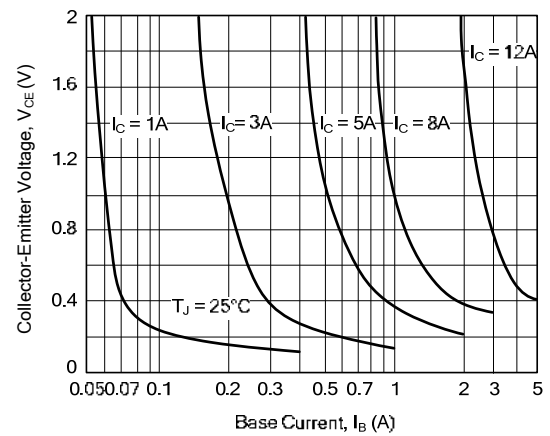


Fig. 7 Base-Emitter Saturation Voltage

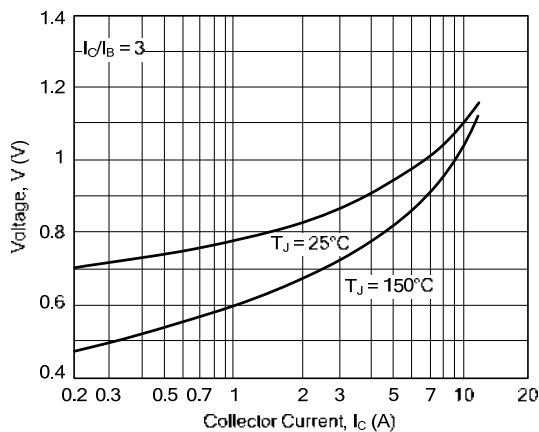


Fig. 8 Collector-Emitter Saturation Voltage

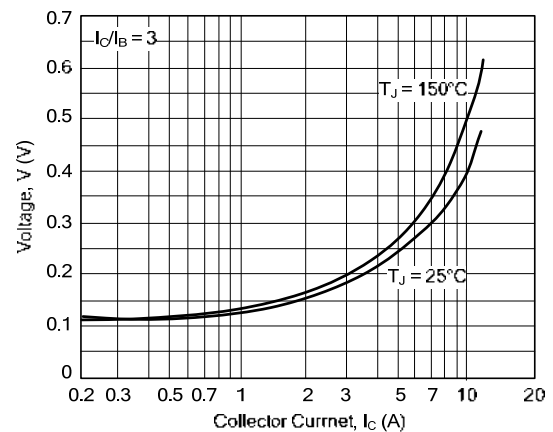


Fig. 9 Collector Cutoff Region

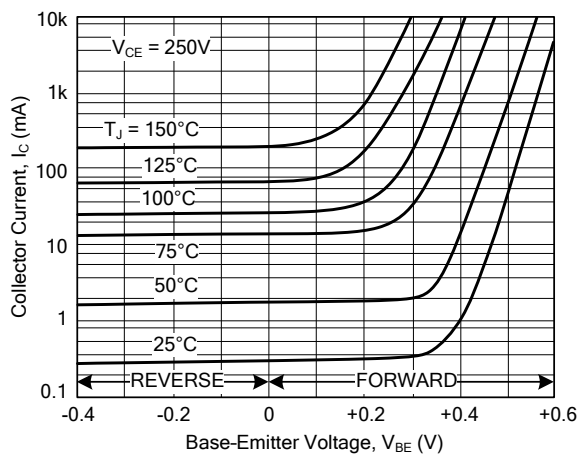
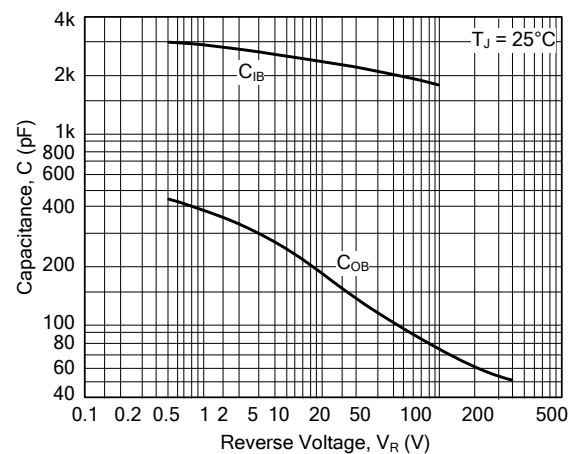


Fig. 10 Capacitance



■ RESISTIVE SWITCHING PERFORMANCE

Fig. 11. Turn-On Time

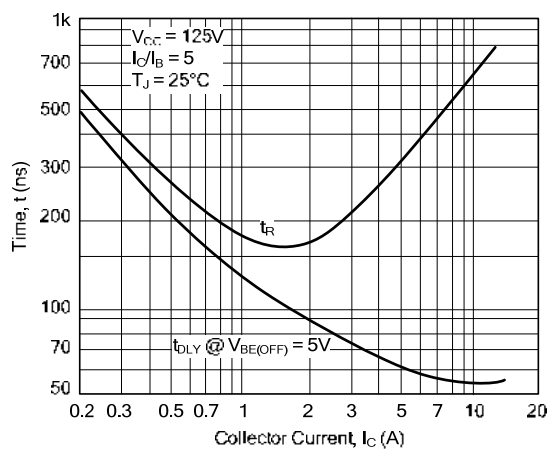


Fig. 12 Turn-Off Time

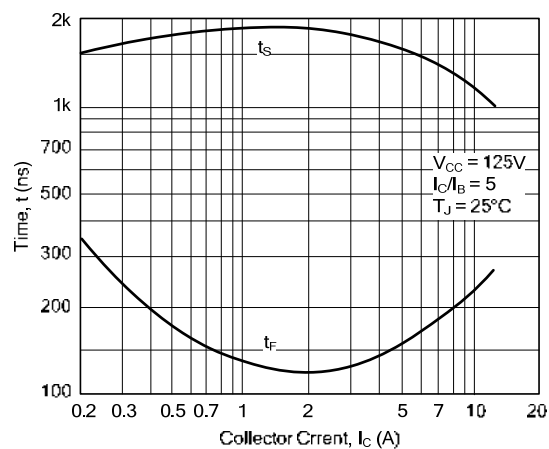
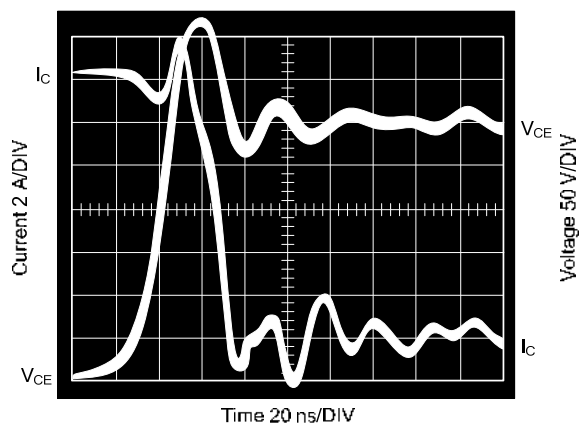


Fig. 13 Typical Inductive Switching Waveforms
(at 300V and 12A with $I_{B1} = 2.4A$ and $V_{BE(off)} = 5V$)



Technical drawing of a mechanical part, showing front and side views with dimensions.

Front View Dimensions:

- Overall width: 15.60 ± 0.15
- Overall height: 20.000 ± 0.2
- Top flange thickness: 2.40 ± 0.2
- Top flange outer radius: $R2.54$
- Top flange inner radius: $R0.125$
- Top flange hole diameter: $3 - \phi 1.50$
- Top flange hole spacing: 8.8 ± 0.2
- Top flange hole diameter: 10.00
- Top flange hole diameter: 10.66
- Top flange hole diameter: 15.60 ± 0.15
- Top flange hole diameter: 5.50 ± 0.2
- Top flange hole diameter: 5.500 ± 0.2
- Top flange hole diameter: 6.000
- Top flange hole diameter: 18.000 ± 0.2
- Top flange hole diameter: 9.750
- Top flange hole diameter: 5.450
- Top flange hole diameter: 5.450
- Top flange hole diameter: 3.87 ± 0.2
- Top flange hole diameter: 14.400 ± 0.25
- Top flange hole diameter: 2.100 ± 0.1
- Top flange hole diameter: 3.100 ± 0.1

Side View Dimensions:

- Overall width: 4.95 ± 0.15
- Overall height: 2.350 ± 0.15
- Top flange thickness: 1.20 ± 0.1
- Top flange outer radius: $R2.50$
- Top flange inner radius: $R2.50$
- Top flange hole diameter: 0.61 ± 0.1