Table 3: Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
$V_{CS(SS)}$	Collector-Source Voltage (V_{BS} = V_{GS} = 0 V)	1700	V
$V_{BS(OS)}$	Base-Source Voltage (I_C= 0, V_{GS} = 0 V)	30	V
$V_{SB(OS)}$	Source-Base Voltage (I_C= 0, V_{GS} = 0 V)	9	V
V_{GS}	Gate-Source Voltage	± 20	V
I_C	Collector Current	3	A
I_{CM}	Collector Peak Current (t_p < 5ms)	6	A
I_B	Base Current	2	A
I_{BM}	Base Peak Current (t_p < 1ms)	4	A
P_{tot}	Total Dissipation at T_C = 25 °C	100	W
T_{stg}	Storage Temperature	-65 to 125	°C
T_J	Max. Operating Junction Temperature	125	°C

Table 4: Thermal Data

Symbol	Parameter		Unit
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case	Max 1	°C/W

Table 5: Electrical Characteristics (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CS(SS)}$	Collector-Source Current (V_{BS} = V_{GS} = 0 V)	$V_{CS(SS)}$ = 1700 V			100	μA
$I_{BS(OS)}$	Base-Source Current (I_C = 0 , V_{GS} = 0 V)	$V_{BS(OS)}$ = 30 V			10	μA
$I_{SB(OS)}$	Source-Base Current (I_C = 0 , V_{GS} = 0 V)	$V_{SB(OS)}$ = 9 V			100	μA
$I_{GS(OS)}$	Gate-Source Leakage	V_{GS} = ± 20 V			500	nA
$V_{CS(ON)}$	Collector-Source ON Voltage	V_{GS} = 10 V I_C = 1.8 A I_B = 0.36 A V_{GS} = 10 V I_C = 0.7 A I_B = 70 mA		1 1	1.5 1.3	V V
h_{FE}	DC Current Gain	I_C = 1.8 A V_{CS} = 1 V V_{GS} = 10 V I_C = 0.7 A V_{CS} = 1 V V_{GS} = 10 V	3.5 6	5 10		
$V_{BS(ON)}$	Base-Source ON Voltage	V_{GS} = 10 V I_C = 1.8 A I_B = 0.36 A V_{GS} = 10 V I_C = 0.7 A I_B = 70 mA		1 0.8	1.2 1	V V
$V_{GS(th)}$	Gate Threshold Voltage	V_{BS} = V_{GS} I_B = 250 μA	1.5	2.2	3	V
C_{iss}	Input Capacitance	V_{CS} = 25 V f = 1MHZ V_{GS} = V_{CB} = 0		750		pF
$Q_{GS(tot)}$	Gate-Source Charge	V_{CS} = 15 V V_{GS} = 10 V V_{CB} = 0 I_C = 1.8 A		12.5		nC
	INDUCTIVE LOAD	V_{GS} = 10 V				
t_s	Storage Time	R_G = 47 Ω V_{Clamp} = 1200 V		760		ns
t_f	Fall Time	t_p = 4 μs I_C = 1.8 A I_B = 0.36 A		14		ns

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
	INDUCTIVE LOAD	V_{GS} = 10 V				
t_s	Storage Time	R_G = 47 Ω V_{Clamp} = 1200 V		690		ns
t_f	Fall Time	t_p = 4 μs I_C = 0.7 A I_B = 70 mA		32		ns
V_{CSW}	Maximum Collector-Source Voltage without Snubber	R_G = 47 Ω h_{FE} = 5 A I_C = 3 A	1500			V
$V_{CS(dyn)}$	Collector-Source Dynamic Voltage (500 ns)	V_{CC} = V_{Clamp} = 400 V V_{GS} = 10 V R_G = 47 Ω I_C = 0.5 A I_B = 0.1 A I_{Bpeak} = 1 A t_{peak} = 500 ns		3.9		V
$V_{CS(dyn)}$	Collector-Source Dynamic Voltage (1μs)	V_{CC} = V_{Clamp} = 400 V V_{GS} = 10 V R_G = 47 Ω I_C = 0.5 A I_B = 0.1 A I_{Bpeak} = 1 A t_{peak} = 500 ns		2.2		V

Figure 3: Safe Operating Area

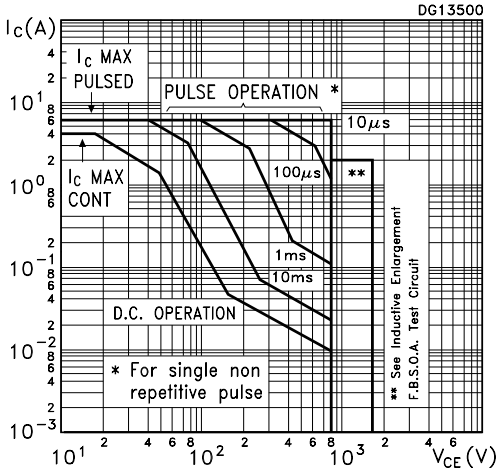

Figure 4: Reverse Biased Safe Operating Area

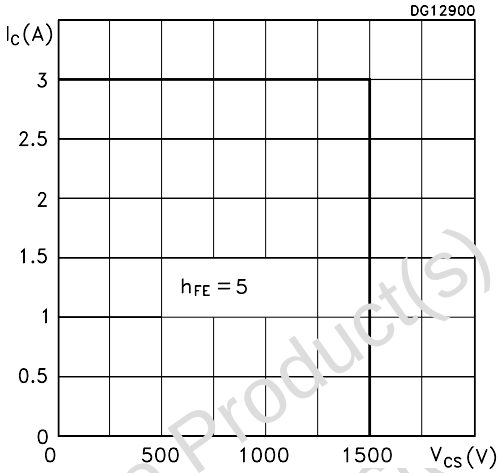

Figure 5: DC Current Gain

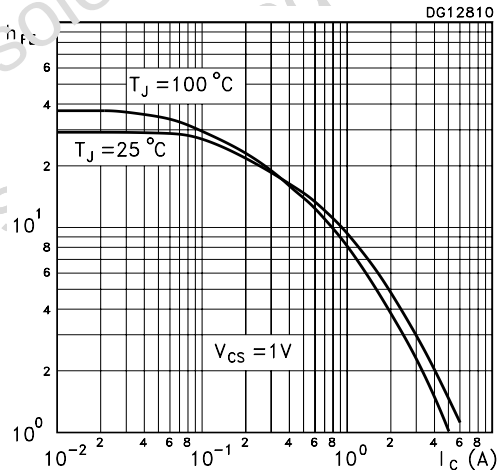

Figure 6: Output Characteristics

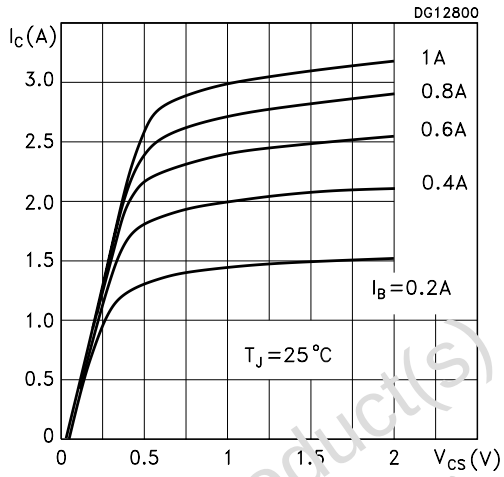

Figure 7: Gate Threshold Voltage vs Temperature

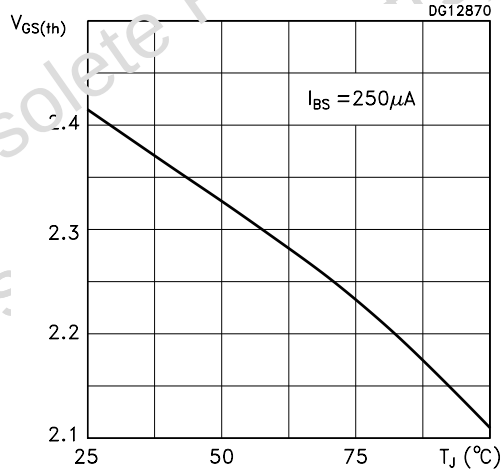

Figure 8: DC Current Gain

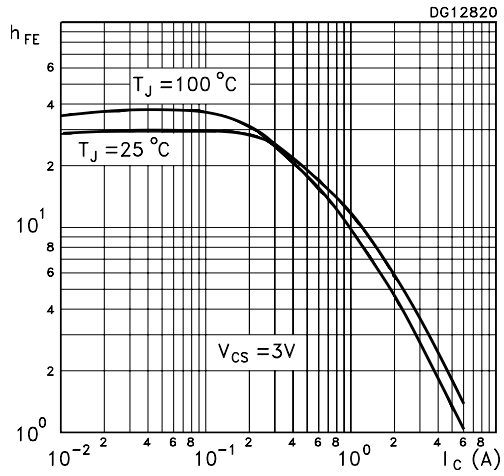

Figure 9: Collector-Source On Voltage

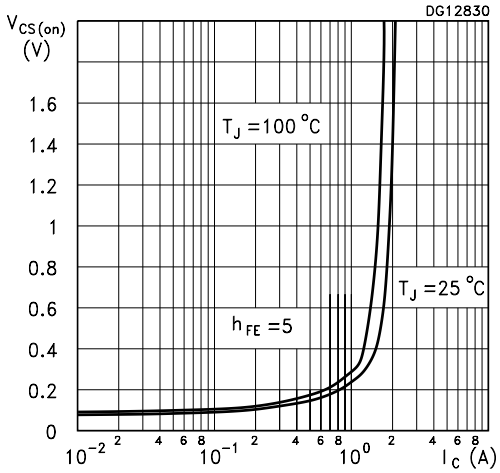

Figure 10: Base-Source On Voltage

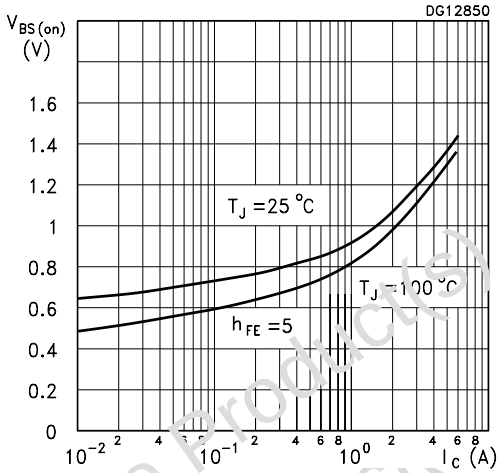

Figure 11: Inductive Load Switching Time

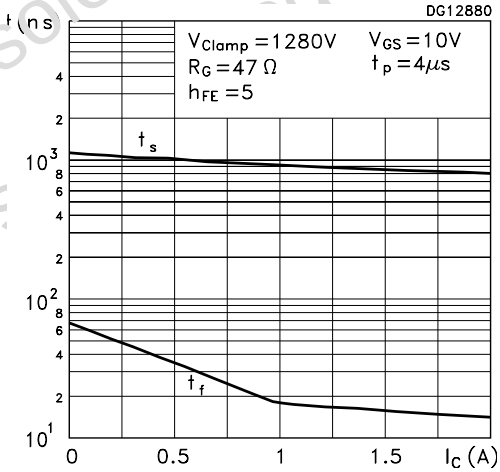

Figure 12: Collector-Source On Voltage

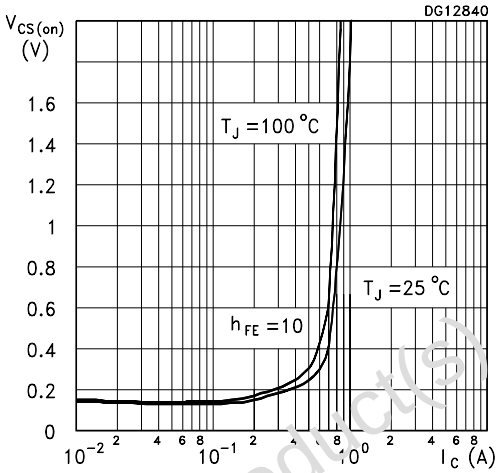

Figure 13: Base-Source On Voltage

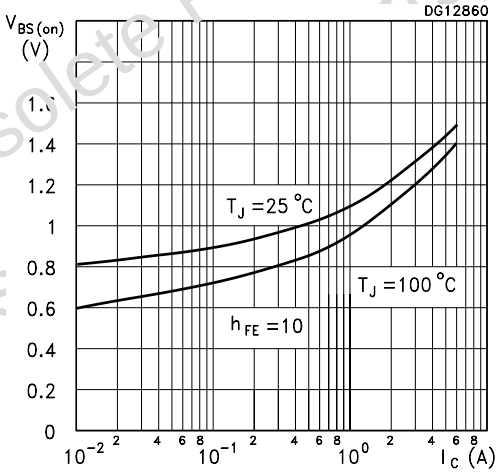

Figure 14: Inductive Load Switching Time

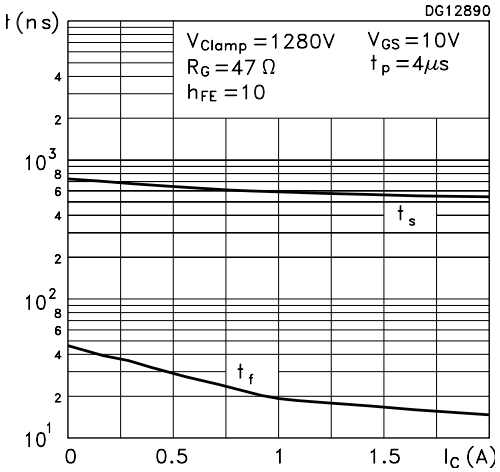

Figure 15: Dynamic Collector-Emitter Saturation Voltage

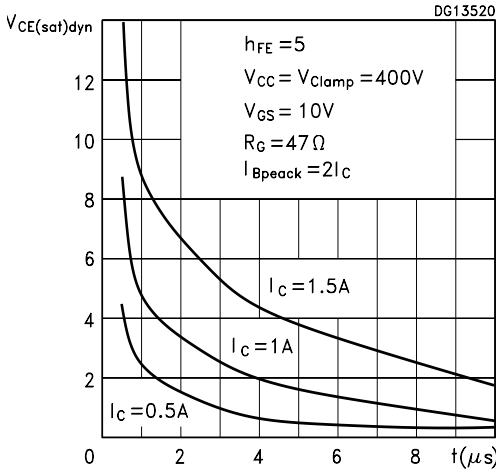

Figure 16: Inductive Load Enlargement FBSOA Circuit

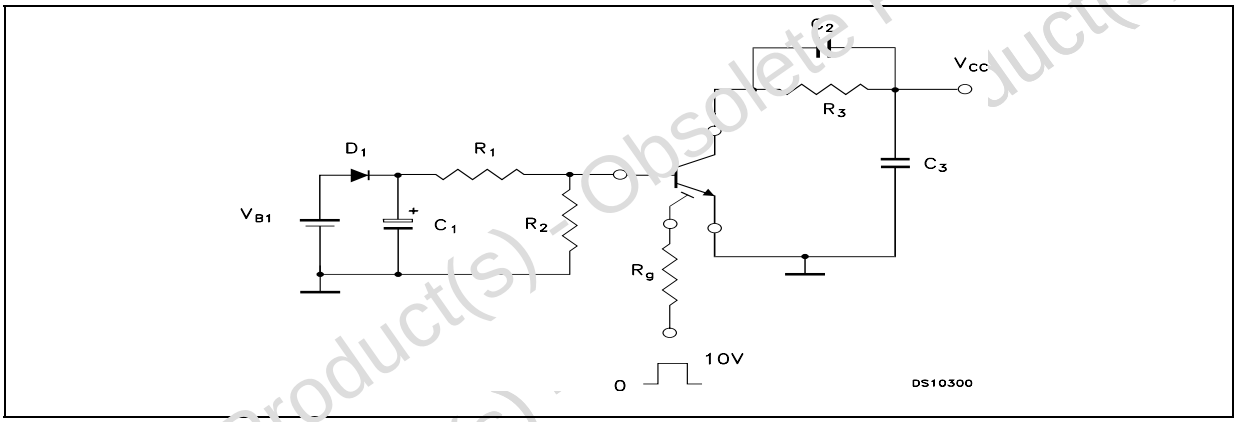

Table 6: Components, Values

V_{B1} = 4.16 V	C_1 = 220 nF
D_1 = BA157	$C_2 \leq$ 70 pF
R_1 = 1 Ω	C_3 = 50 nF
R_2 = 100 Ω	V_g = 10 V
$R_3 = V_{CC} / I_{Cn}$	Pulse Time = 5 μs
R_g = 47 Ω	

TO247-4L MECHANICAL DATA

DIM.	mm		
	MIN.	TYP.	MAX.
A	4.85		5.15
A1	2.20		2.60
b	0.95	1.10	1.30
b1	1.30		1.70
b2	2.50		2.90
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e		2.54	
e1		5.08	
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
ØP	3.55		3.65
ØR	4.50		5.50
S		5.50	

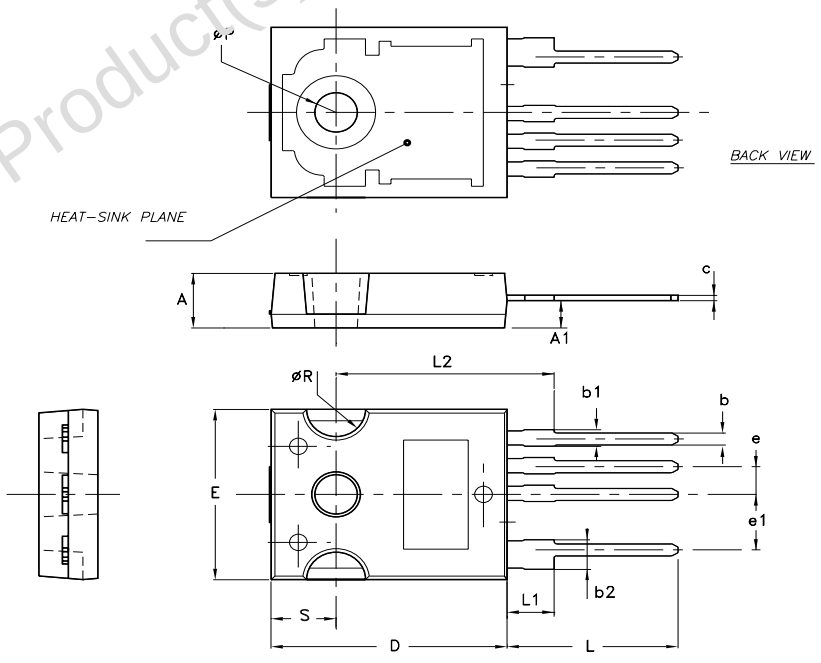

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Table 7: Revision History

Date	Release	Change Designator
13-Sep-2004	1	First Release.
04-Oct-2004	2	Figure 15 has been updated on page 6.