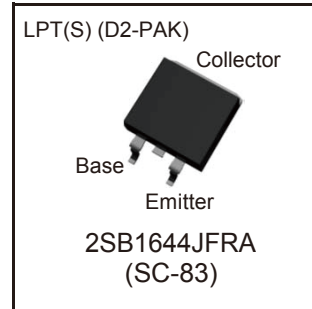


Parameter	Value
$V_{CEO}$	-80V
$I_C$	-4A

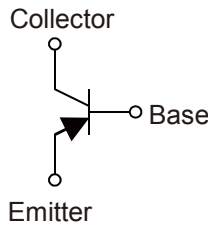
### ●Features

- 1) Suitable for Power Driver
- 2) Low  $V_{CE(sat)}$   
 $V_{CE(sat)} = -1.5V(\text{Max.}) (I_C/I_B = -3A / -300mA)$
- 3) Lead Free/RoHS Compliant.

### ●Outline



### ●Inner circuit



### ●Applications

Automotive power driver , LED driver  
Power supply

### ●Packaging specifications

Part No.	Package	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
2SB1644JFRA	Taping	TL	330	24	1,000	B1644

### ●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Values	Unit	
Collector-base voltage	$V_{CBO}$	-80	V	
Collector-emitter voltage	$V_{CEO}$	-80	V	
Emitter-base voltage	$V_{EBO}$	-5	V	
Collector current	DC	$I_C$	-4	A
	Pulsed	$I_{CP}^{*1}$	-6	A
Power dissipation	$P_D^{*2}$	30	W	
Junction temperature	$T_j$	150	°C	
Range of storage temperature	$T_{stg}$	-55 to +150	°C	

\*1 Pw=100ms, single pulse

\*2 Tc=25°C

●Electrical characteristics (Ta = 25°C)

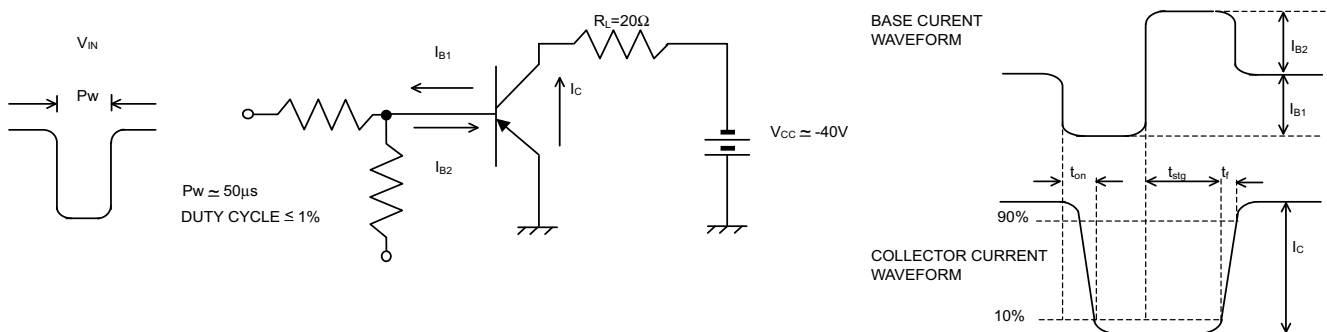
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	$BV_{CEO}$	$I_C = -1mA$	-80	-	-	V
Collector-base breakdown voltage	$BV_{CBO}$	$I_C = -50\mu A$	-80	-	-	V
Emitter-base breakdown voltage	$BV_{EBO}$	$I_E = -50\mu A$	-5	-	-	V
Collector cut-off current	$I_{CBO}$	$V_{CB} = -80V$	-	-	-10	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -4V$	-	-	-10	$\mu A$
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -3A, I_B = -300mA$	-	-	-1.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = -3A, I_B = -300mA$	-	-	-1.5	V
DC current gain	$h_{FE}^{*3}$	$V_{CE} = -5V, I_C = -1A$	100	-	320	-
Transition frequency	$f_T$	$V_{CE} = -5V, I_E = 500mA$ $f = 5MHz$	-	12	-	MHz
Output capacitance	$C_{ob}$	$V_{CB} = -10V, I_E = 0A,$ $f = 1MHz$	-	100	-	pF
Turn-on time	$t_{on}^{*4}$	$I_C = -2A$ $I_{B1} = -200mA$ $I_{B2} = 200mA$ $V_{CC} \approx -40V$	-	160	-	ns
Storage time	$t_{stg}^{*4}$		-	1000	-	ns
Fall time	$t_f^{*4}$		-	600	-	ns

\*3  $h_{FE}$  rank

\*4 See switching time test circuit

● $h_{FE}$  rank categories

Rank	E	F
$h_{FE}$	100 to 200	160 to 320



●Electrical characteristic curves(Ta = 25°C)

Fig.1 Ground Emitter Propagation Characteristics

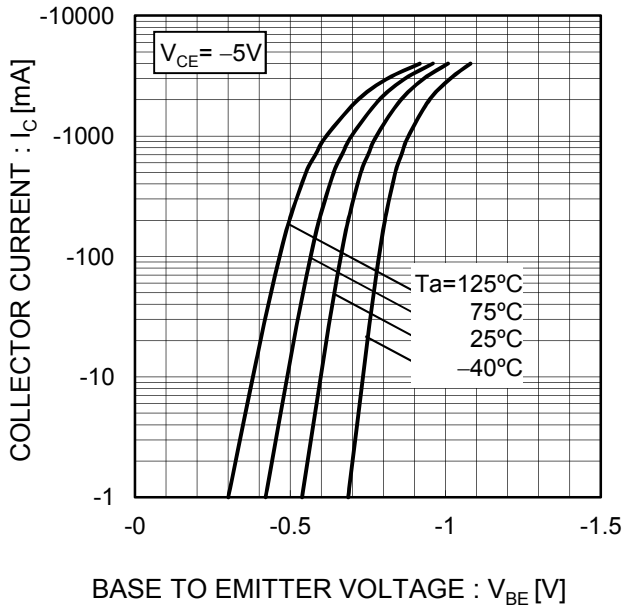


Fig.2 Typical Output Characteristics

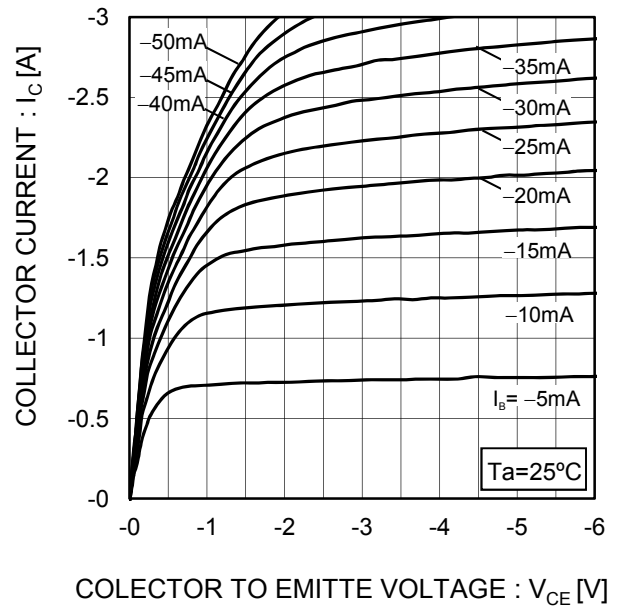


Fig.3 DC Current Gain vs. Collector Current (I)

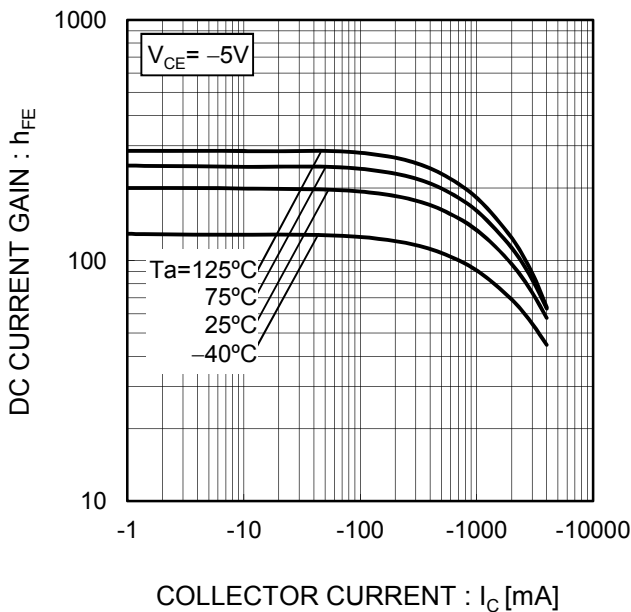
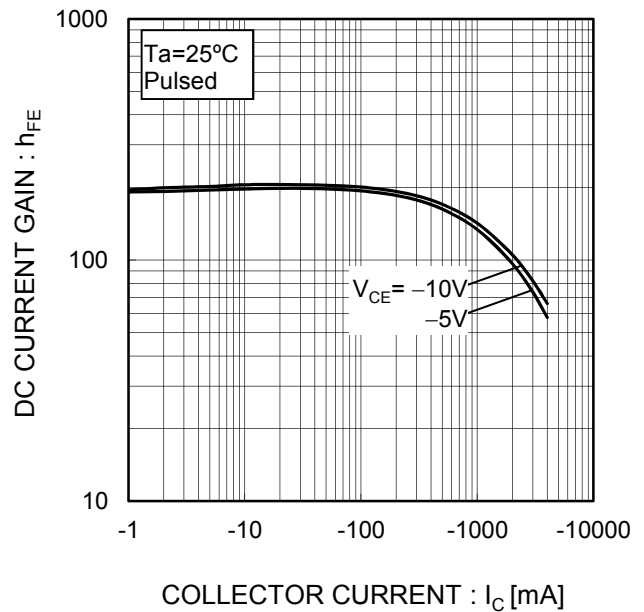


Fig.4 DC Current Gain vs. Collector Current (II)



●Electrical characteristic curves(Ta = 25°C)

Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current (I)

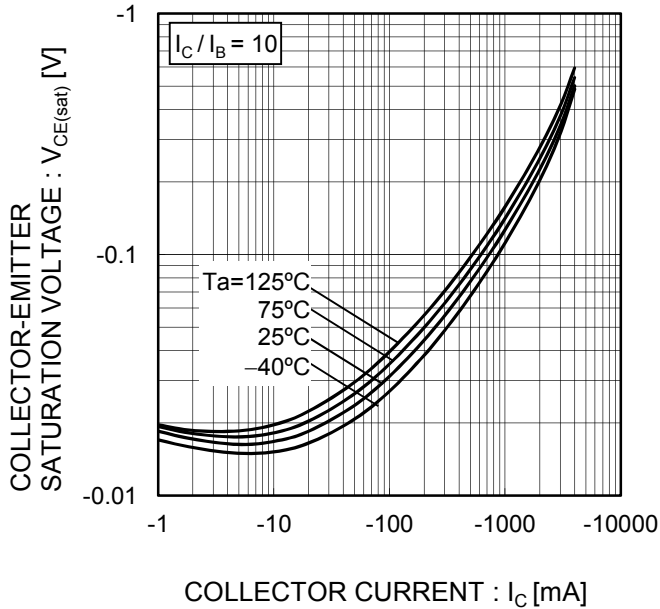


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

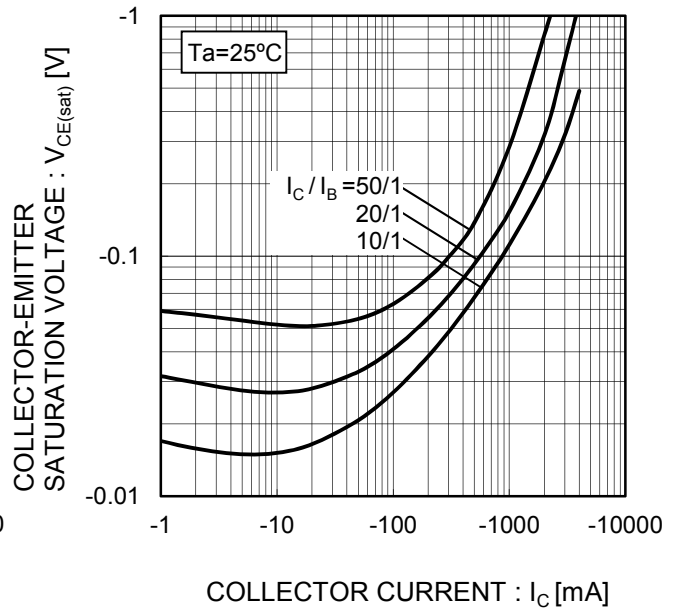


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

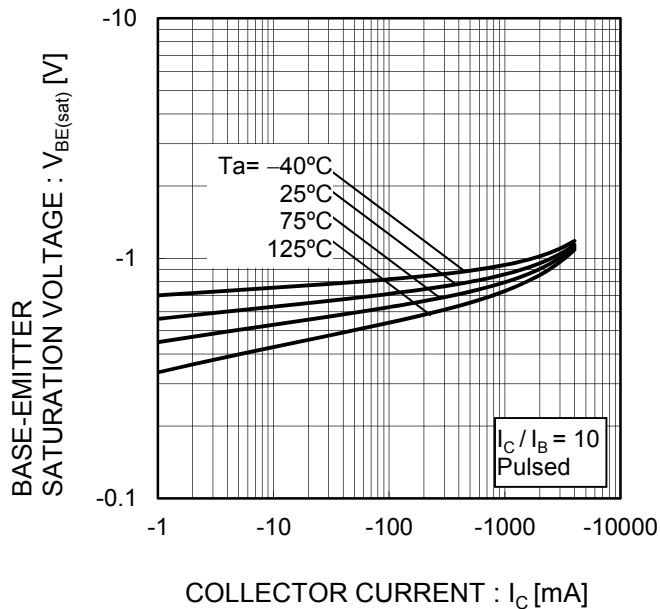
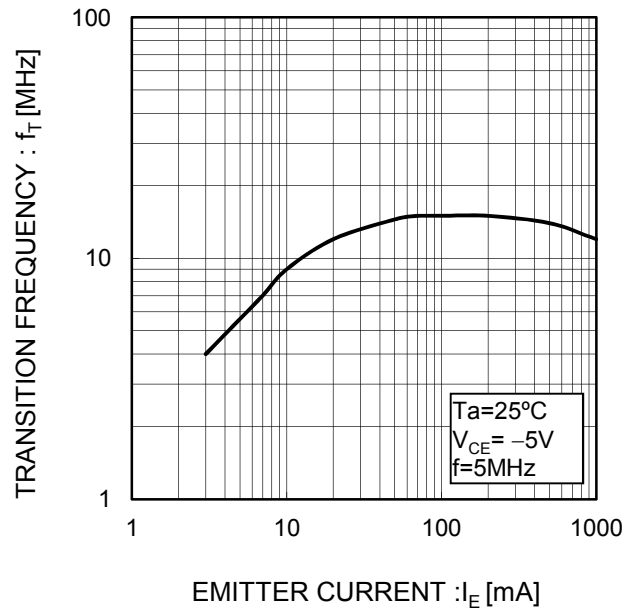


Fig.8 Gain Bandwidth Product vs. Emitter Current



●Electrical characteristic curves(Ta = 25°C)

Fig.9 Emitter input capacitance vs. Emitter-Base Voltage  
Collector output capacitance vs. Collector-Base Voltage

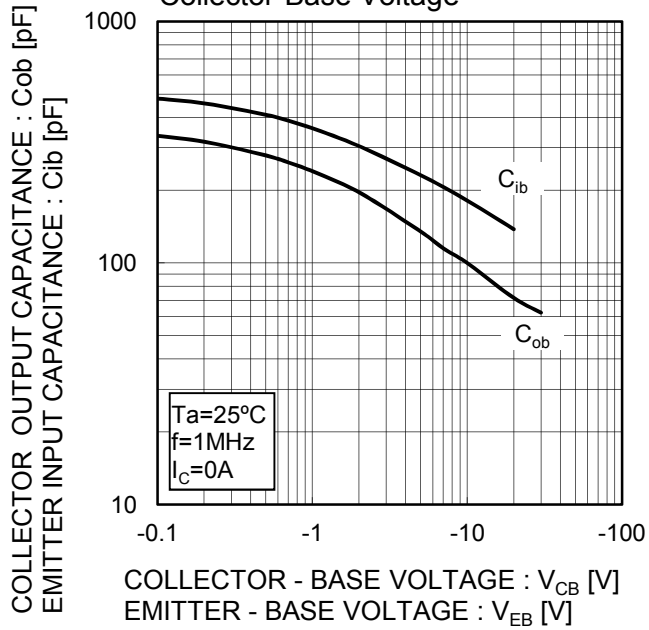
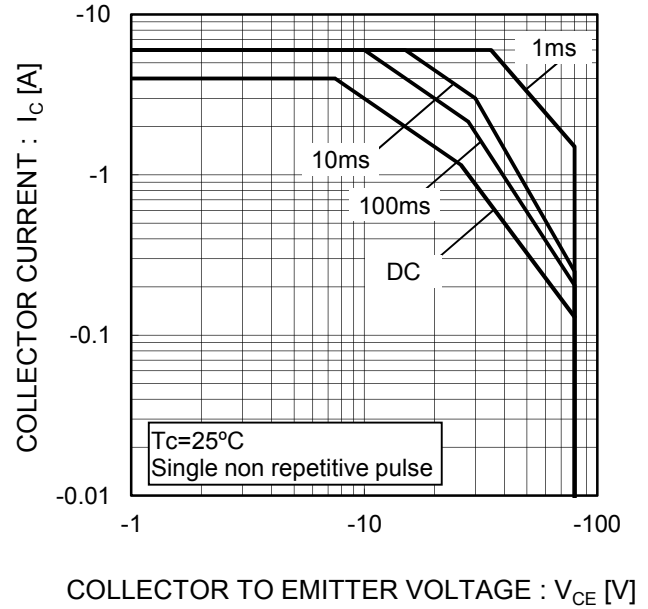
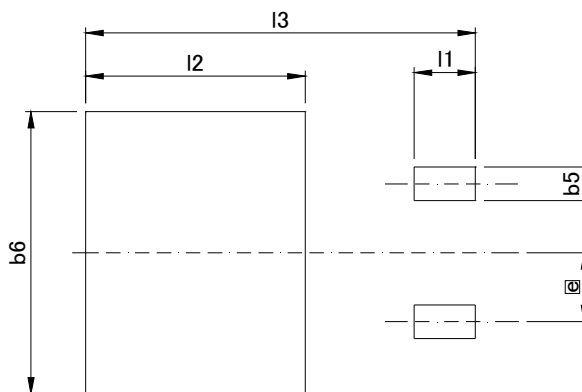
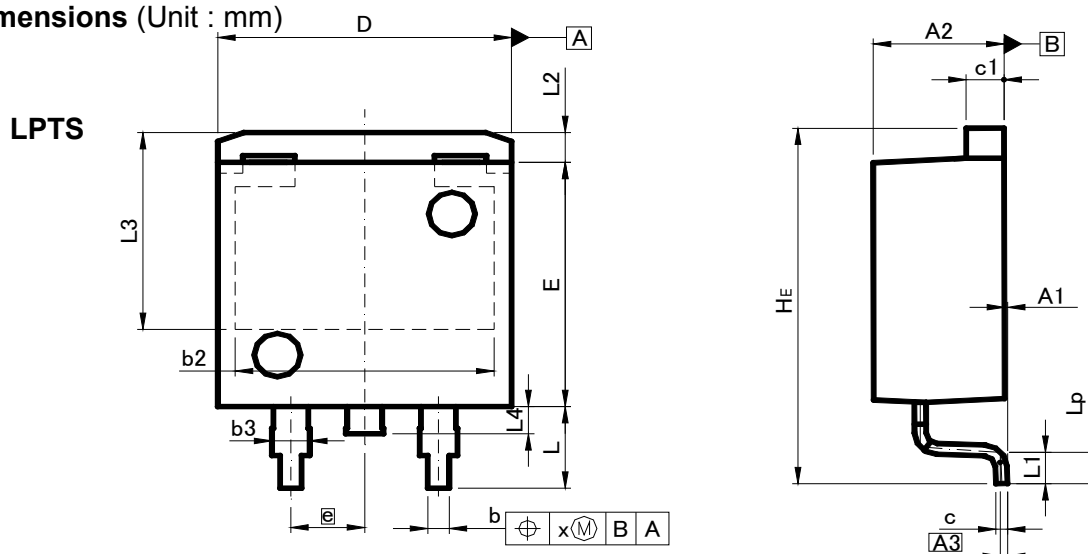


Fig.10 Safe Operating Area



●Dimensions (Unit : mm)



Pattern of terminal position areas  
[Not a recommended pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A1	0.00	0.30	0.000	0.012
A2	4.30	4.70	0.169	0.185
A3	0.25		0.010	
b	0.68	0.98	0.027	0.039
b2	8.90		0.350	
b3	1.14	1.44	0.045	0.057
c	0.30	0.60	0.012	0.024
c1	1.10	1.50	0.043	0.059
D	9.80	10.40	0.386	0.409
E	8.80	9.20	0.346	0.362
e	2.54		0.100	
HE	12.80	13.40	0.504	0.528
L	2.70	3.30	0.106	0.130
L1	0.90	1.50	0.035	0.059
L2	1.10		0.043	
L3	7.25		0.285	
L4	1.00		0.039	
Lp	0.90	1.50	0.035	0.059
x	-	0.25	-	0.010

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b5	-	1.23	-	0.049
b6	-	10.40	-	0.409
l1	-	2.10	-	0.083
l2	-	7.55	-	0.297
l3	-	13.40	-	0.528

Dimension in mm / inches

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