NPN 1.5A 160V Middle Power Transistor

Parameter	Value
$V_{\sf CEO}$	160V
I _C	1.5A

Features

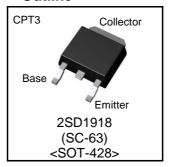
1) Suitable for Middle Power Driver

2) Complementary PNP Types: 2SB1275

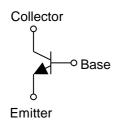
3) High voltage : V_{CEO} =160V

4) Lead Free/RoHS Compliant.

Outline



•Inner circuit



Applications

Motor driver , LED driver Power supply

Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
2SD1918	CPT3	6595	TL	330	16	2,500	D1918

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Values	Unit
Collector-base voltage		V _{CBO}	160	V
Collector-emitter voltage		V _{CEO}	160	V
Emitter-base voltage		V_{EBO}	5	V
Collector current	DC	I _C	1.5	Α
	Pulsed	I _{CP} *1	3.0	Α
Power dissipation		P _D *2	1	W
		P _D *3	10	W
Junction temperature		T _j	150	°C
Range of storage temperature		T _{stg}	-55 to +150	°C

^{*1} Pw=20ms, duty=1/2

●Electrical characteristics(Ta = 25°C)

Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit
Collector-emitter breakdown voltage	BV _{CEO}	I _C = 1mA	160	ı	-	V
Collector-base breakdown voltage	BV _{CBO}	I _C = 50μA	160	ı	-	V
Emitter-base breakdown voltage	BV_{EBO}	I _E = 50μA	5	ı	-	V
Collector cut-off current	I _{CBO}	V _{CB} = 120V	-	-	1	μА
Emitter cut-off current	I _{EBO}	$V_{EB} = 4V$	-	1	1	μА
Collector-emitter saturation voltage	V _{CE(sat)} *4	$I_C = 1A, I_B = 0.1A$	-	ı	2	V
DC current gain	h _{FE}	$V_{CE} = 5V, I_{C} = 100 \text{mA}$	120	ı	390	-
Transition frequency	f⊤	$V_{CE} = 5V$, $I_{E} = -100$ mA $f=30$ MH $_{Z}$	-	80	-	MHz
Output capacitance	C_ob	$V_{CB} = 10V$, $I_E = 0A$, $f = 1MHz$	-	20	-	pF

^{*4} Pulsed

●h_{FE} rank categories

Rank	Q	R
h _{FE}	120 to 270	180 to 390

^{*2} Mounted on a substrate

^{*3} Tc=25°C

●Electrical characteristic curves(Ta = 25°C)

Fig.1 Ground Emitter Propagation Characteristics

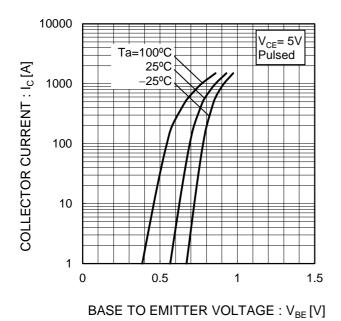
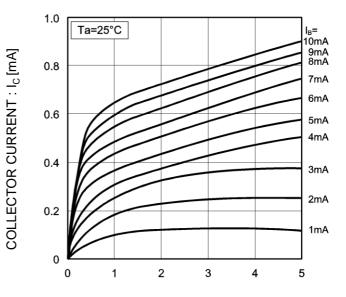


Fig.2 Typical Output Characteristics



COLECTOR TO EMITTE VOLTAGE : $V_{CE}[V]$

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

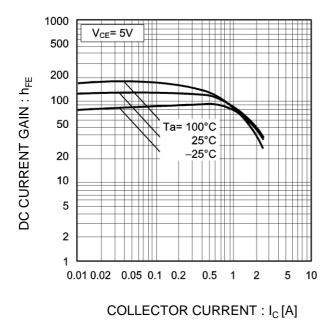
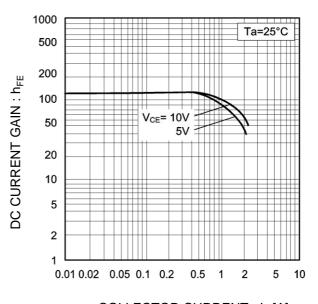


Fig.4 DC current gain vs. output current (II)



COLLECTOR CURRENT : I_C [A]

●Electrical characteristic curves(Ta = 25°C)

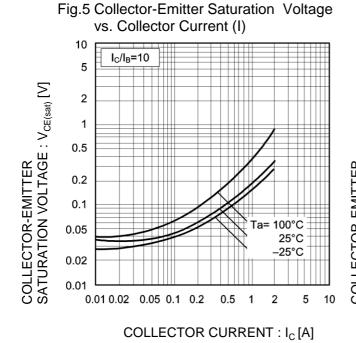


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II) 10 Ta=25°C 5 COLLECTOR-EMITTER SATURATION VOLTAGE : V_{CE(sat)} [V] 2 1 0.5 0.2 0.1 0.05 $I_{\rm C}/I_{\rm B}=20$ 0.02 0.01 0.01 0.02 0.05 0.1 0.2 0.5 10 COLLECTOR CURRENT : I_C [mA]

Fig.7 Base-Emitter Saturation Voltage vs. Collector Current 10 $I_C/I_B=10$ 5 BASE-EMITTER SATURATION VOLTAGE : V_{BE(sat)} [V] 2 1 0.5 Ta= 100°C 25°C -25°C 0.2 0.1 0.01 0.02 0.05 0.1 0.2 0.5 COLLECTOR CURRENT : I_C[A]

Fig.8 Gain Bandwidth Product vs. Emitter Current 1000 Ta= 25°C 500 V_{CE}= 5V TRANSITION FREQUENCY: fr [MHz] 200 100 50 20 10 5 2 -20 -50 -100 -200 -500 -1000 EMITTER CURRENT : I_E [mA]

●Electrical characteristic curves(Ta = 25°C)

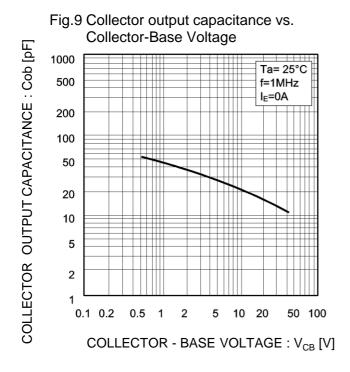
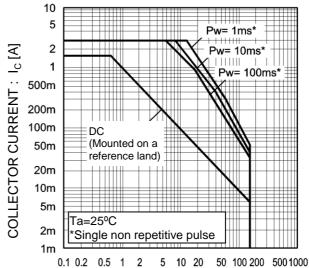
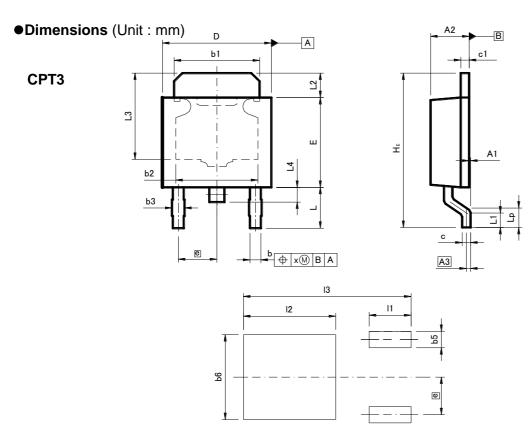


Fig.10 Safe Operating Area



COLLECTOR TO EMITTER VOLTAGE : $V_{CE}[V]$



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

DIM	MILIM	ETERS	INCHES		
DIM	MIN	MAX	MIN	MAX	
A1	0.00	0.15	0.000	0.006	
A2	2.20	2.50	0.087	0.098	
A3	0.2	25	0.010		
b	0.55	0.75	0.022	0.030	
b1	5.00	5.30	0.197	0.209	
b2	5.0	00	0.1	97	
b3	0.	75	0.030		
С	0.40	0.60	0.016	0.024	
c1	0.40	0.60	0.016	0.024	
D	6.30	6.70	0.248	0.264	
E	5.40	5.80	0.213	0.228	
е	2.3	30	0.091		
HE	9.00	10.00	0.354	0.394	
L	2.20	2.80	0.087	0.110	
L1	0.80	1.40	0.031	0.055	
L2	1.20	1.80	0.047	0.071	
L3	5.30		0.209		
L4	0.90		0.035		
Lp	1.00	1.60	0.039	0.063	
X	-	0.25	-	0.010	

DIM	MILIM	ETERS	INCHES		
DIM	MIN	MAX	MIN	MAX	
b5	-	1.00	ı	0.04	
b6	-	5.20	ı	0.205	
11	_	2.50	-	0.098	
12	_	5.50	_	0.217	
13	_	10.00	_	0.394	

Dimension in mm / inches

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