2SD2138, 2SD2138A

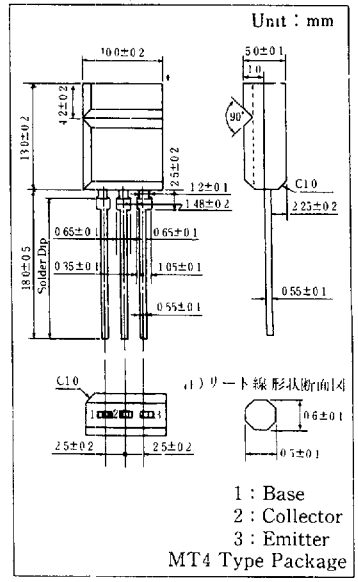
Silicon NPN Triple-Diffused Planar Darlington Type

Power Amplifier
Complementary Pair with 2SB1418, 2SB1418A

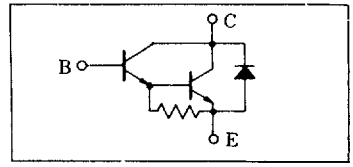
■ Features

- High DC current gain (h_{FE}) and good linearity
- Automatic mounting by radial taping is possible

■ Package Dimensions



■ Inner Circuit



■ Absolute Maximum Ratings (Tc=25°C)

Item		Symbol	Value	Unit
Collector-base voltage	2SD2138	V_{CBO}	60	V
	2SD2138A		80	
Collector-emitter voltage	2SD2138	V_{CEO}	60	V
	2SD2138A		80	
Emitter-base voltage		V_{EBO}	5	V
Peak collector current		I_{CP}	4	A
Collector current		I_C	2	A
Collector power dissipation	T_C=25°C	P_C	15	W
	Ta=25°C		2	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55 ~ +150	°C

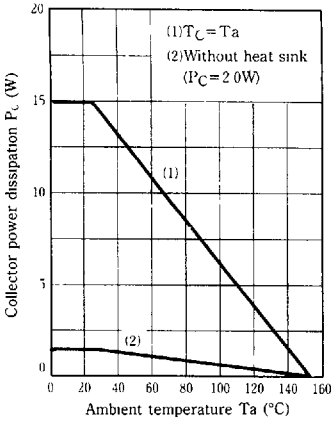
■ Electrical Characteristics (Tc=25°C)

Item		Symbol	Condition	min.	typ.	max.	Unit
Collector cutoff current	2SD2138	I_{CBO}	V_{CB}=60V, I_E=0			100	μA
	2SD2138A		V_{CB}=80V, I_E=0			100	
Collector cutoff current	2SD2138	I_{CEO}	V_{CE}=30V, I_B=0			100	μA
	2SD2138A		V_{CE}=40V, I_B=0			100	
Emitter cutoff current		I_{EBO}	V_{EB}=5V, I_C=0			100	μA
Collector-emitter voltage	2SD2138	V_{CEO}	I_C=30mA, I_B=0	60			V
	2SD2138A			80			
DC current gain		h_{FE1}	V_{CE}=4V, I_C=1A	1000			
		h_{FE2}*	V_{CE}=4V, I_C=2A	1000		10000	
Base-emitter voltage		V_{BE}	V_{CE}=4V, I_C=2A			2.8	V
Collector-emitter saturation voltage		$V_{CE(sat)}$	I_C=2A, I_B=8mA			2.5	V
Transition frequency		f_T	V_{CE}=10V, I_C=0.5A, f=1MHz		20		MHz
Turn-on time		t_{on}	I_C=2A, I_{B1}=8mA, I_{B2}=−8mA		0.4		μs
Turn-off time		t_{off}	V_{CC}=50V		4		μs

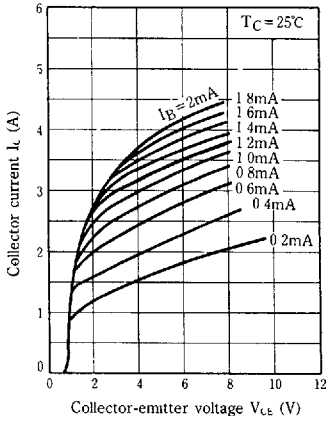
*h_{FE2} Classifications

Class	R	Q	P
h_{FE2}	1000 ~ 2500	2000 ~ 5000	4000 ~ 10000

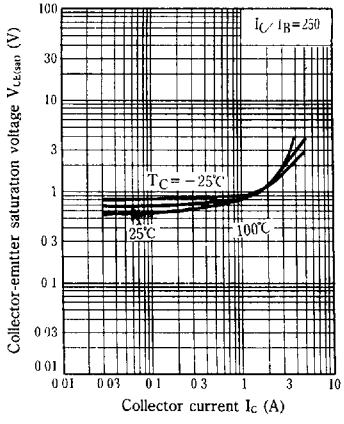
$P_C - Ta$



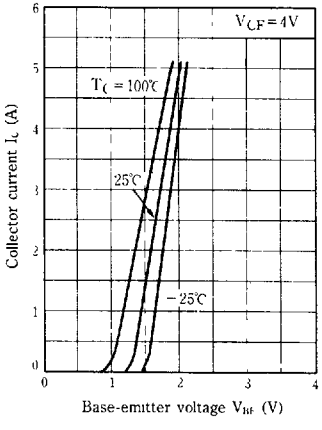
$I_C - V_{CE}$



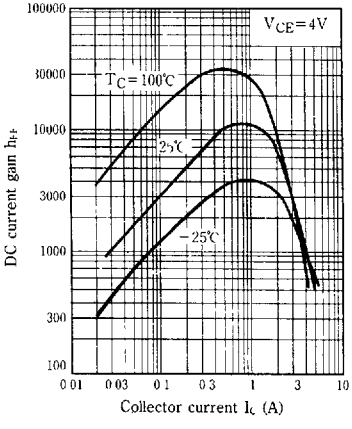
$V_{CE(sat)} - I_C$



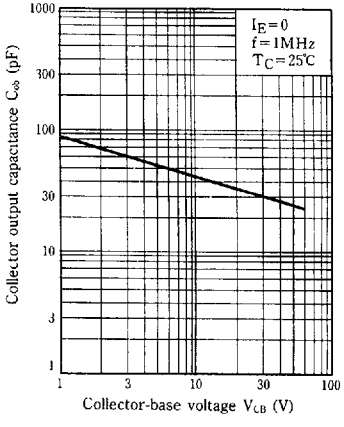
$I_C - V_{BE}$



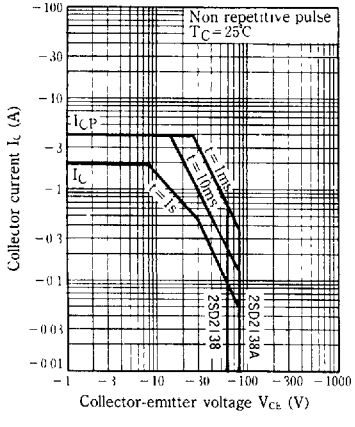
$h_{FE} - I_C$



$C_{ob} - V_{CB}$



Safety operation area-forward bias (ASO)



$R_{th(t)} - t$