

2SD1538, 2SD1538A

Silicon NPN epitaxial planar type

For low-voltage switching

Complementary to 2SB1070 and 2SB1070A

Features

- Low collector to emitter saturation voltage $V_{CE(sat)}$
- High-speed switching
- N type package enabling direct soldering of the radiating fin to the printed circuit board, etc. of small electronic equipment.

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$)

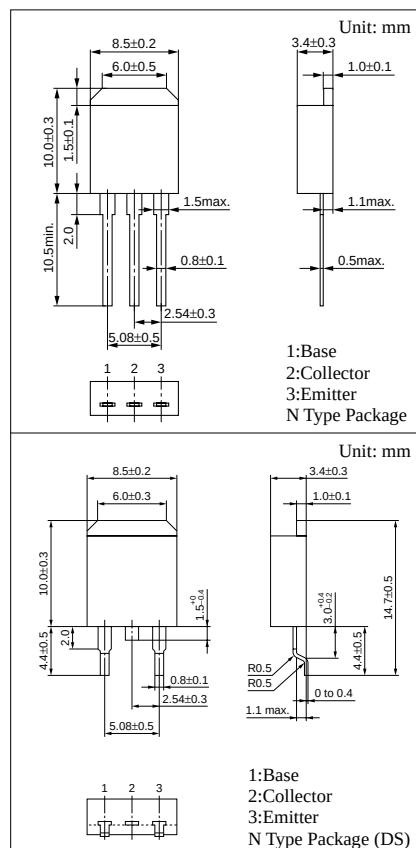
Parameter		Symbol	Ratings	Unit
Collector to base voltage	2SD1538	V_{CBO}	40	V
	2SD1538A		50	
Collector to emitter voltage	2SD1538	V_{CEO}	20	V
	2SD1538A		40	
Emitter to base voltage		V_{EBO}	5	V
Peak collector current		I_{CP}	8	A
Collector current		I_C	4	A
Collector power dissipation	$T_C=25^{\circ}\text{C}$	P_C	25	W
	$T_a=25^{\circ}\text{C}$		1.3	
Junction temperature		T_j	150	$^{\circ}\text{C}$
Storage temperature		T_{stg}	-55 to +150	$^{\circ}\text{C}$

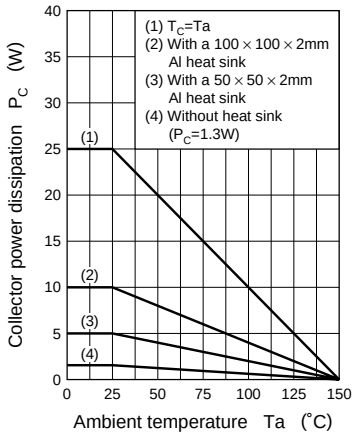
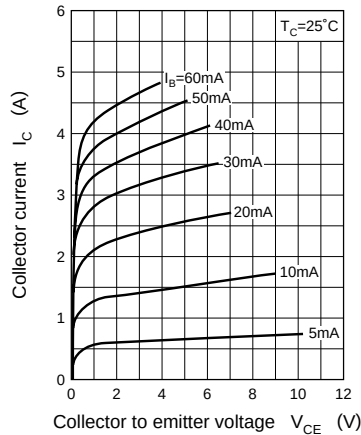
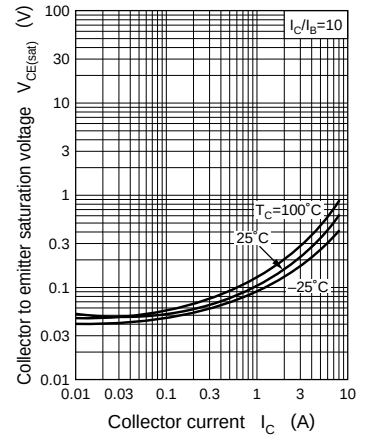
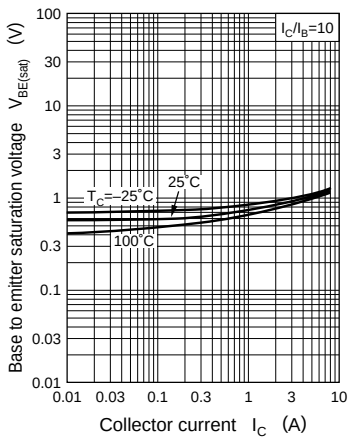
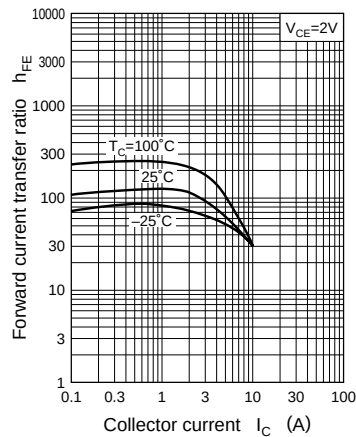
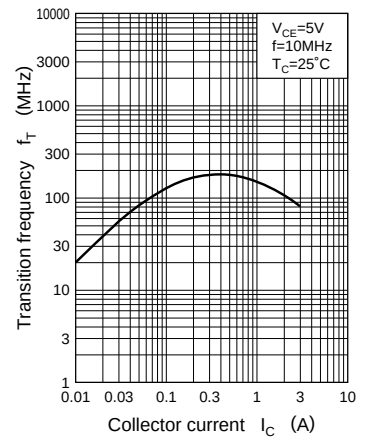
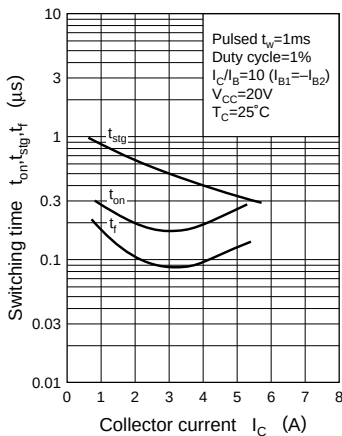
Electrical Characteristics ($T_C=25^\circ\text{C}$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	2SD1538	I_{CBO}			50	μA
	2SD1538A				50	
Emitter cutoff current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$			50	μA
Collector to emitter voltage	2SD1538	V_{CEO}	$I_C = 10\text{mA}, I_B = 0$	20		V
	2SD1538A			40		
Forward current transfer ratio		h_{FE1}	$V_{CE} = 2\text{V}, I_C = 0.1\text{A}$	45		
		h_{FE2}^*	$V_{CE} = 2\text{V}, I_C = 1\text{A}$	90	260	
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 2\text{A}, I_B = 0.1\text{A}$			0.5	V
Base to emitter saturation voltage	$V_{BE(sat)}$	$I_C = 2\text{A}, I_B = 0.1\text{A}$			1.5	V
Transition frequency	f_T	$V_{CE} = 5\text{V}, I_C = 0.5\text{A}, f = 10\text{MHz}$		120		MHz
Turn-on time	t_{on}	$I_C = 2\text{A}, I_{B1} = 0.2\text{A}, I_{B2} = -0.2\text{A}, V_{CC} = 20\text{V}$		0.2		μs
Storage time	t_{stg}			0.5		μs
Fall time	t_f			0.1		μs

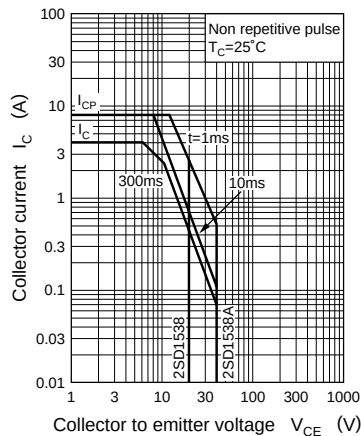
* h_{FE2} Rank classification

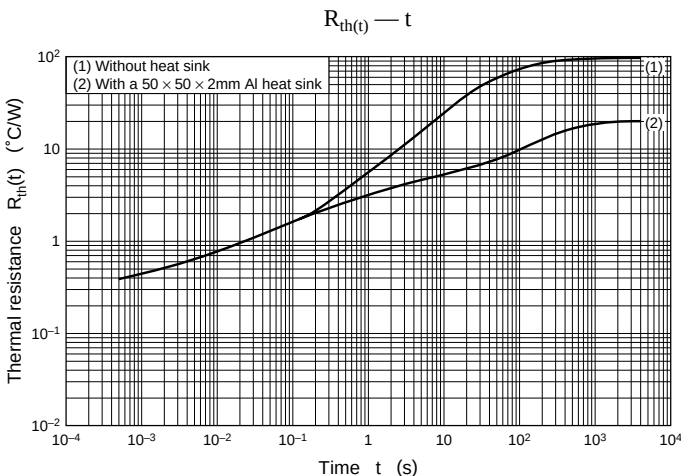
Rank	Q	P
h_{FE2}	90 to 180	130 to 260



$P_C - T_a$  $I_C - V_{CE}$  $V_{CE(sat)} - I_C$  $V_{BE(sat)} - I_C$  $h_{FE} - I_C$  $f_T - I_C$  $t_{on}, t_{stg}, t_f - I_C$ 

Area of safe operation (ASO)





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