

2SA2142

High-Voltage Switching Applications

- High breakdown voltage: $V_{CEO} = -600\text{ V}$

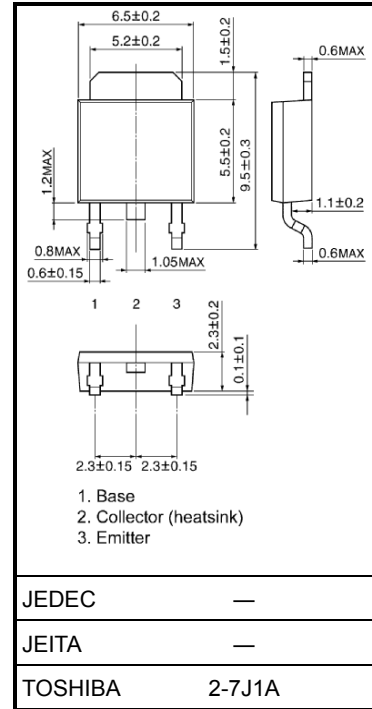
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristic	Symbol	Rating	Unit	
Collector-base voltage	V_{CB0}	-600	V	
Collector-emitter voltage	V_{CE0}	-600	V	
Emitter-base voltage	V_{EB0}	-7	V	
Collector current	DC	I_C	-0.5	A
	Pulse	I_{CP}	-1	
Base current	I_B	-0.25	A	
Collector power dissipation	$T_a = 25^\circ\text{C}$	P_c	1	W
	$T_c = 25^\circ\text{C}$		15	
Junction temperature	T_j	150	$^\circ\text{C}$	
Storage temperature range	T_{stg}	-55 to 150	$^\circ\text{C}$	

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Unit: mm

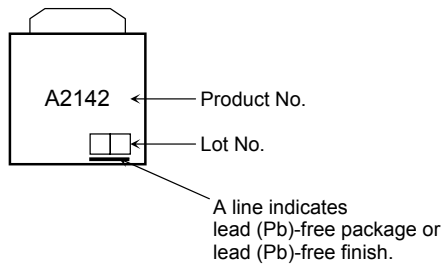


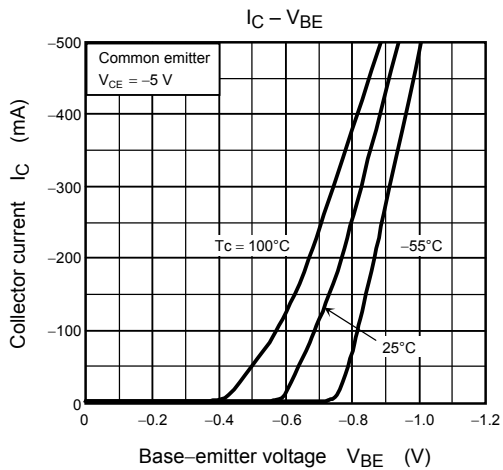
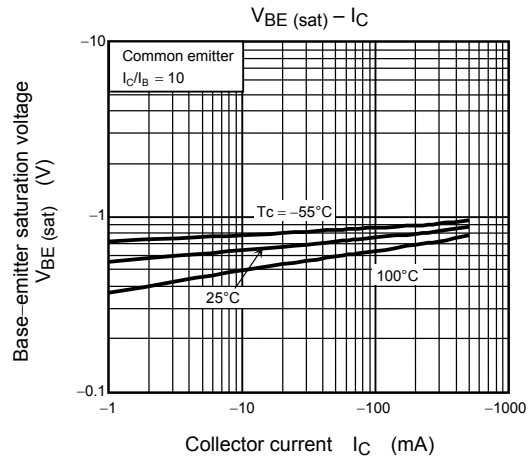
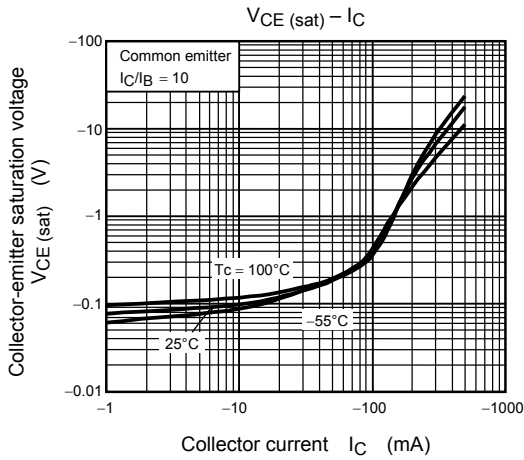
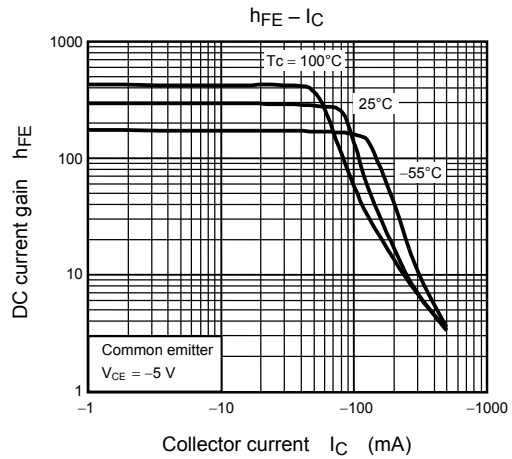
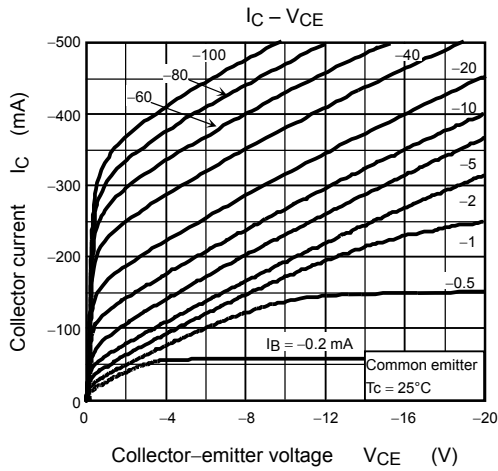
Weight: 0.36 g (typ.)

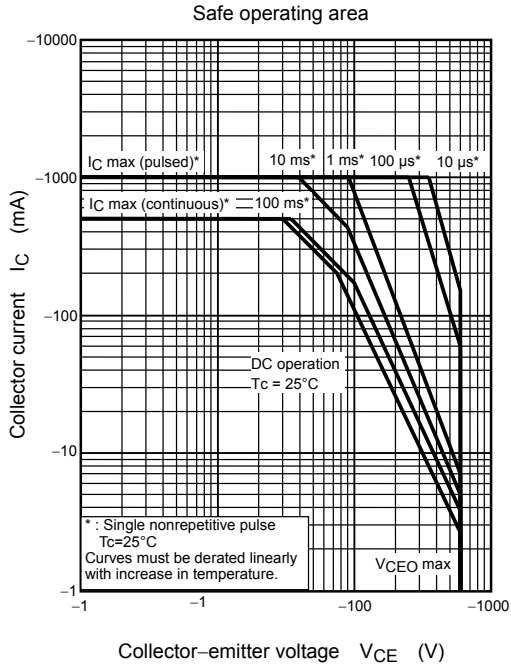
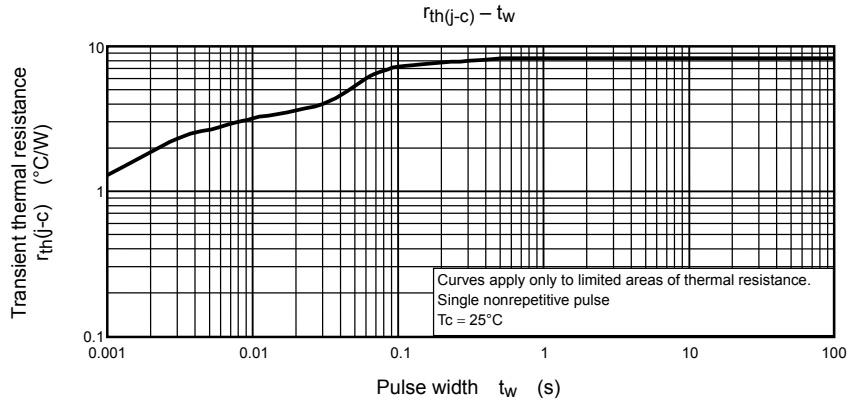
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current		I_{CBO}	$V_{CB} = -600\text{ V}, I_E = 0$	—	—	-10	μA
Emitter cutoff current		I_{EBO}	$V_{EB} = -7\text{ V}, I_C = 0$	—	—	-1	μA
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = -10\text{ mA}, I_B = 0$	-600	—	—	V
DC current gain		$h_{FE(1)}$	$V_{CE} = -5\text{ V}, I_C = -1\text{ mA}$	70	—	500	
		$h_{FE(2)}$	$V_{CE} = -5\text{ V}, I_C = -50\text{ mA}$	100	—	400	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = -100\text{ mA}, I_B = -10\text{ mA}$	—	—	-1.0	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = -100\text{ mA}, I_B = -10\text{ mA}$	—	-0.76	-0.9	V
Transition frequency		f_T	$V_{CE} = -5\text{ V}, I_C = -50\text{ mA}$	—	35	—	MHz
Collector output capacitance		C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	24	—	pF
Switching time	Rise time	t_r		—	0.2	—	μs
	Storage time	t_{stg}		—	2.3	—	
	Fall time	t_f		$I_{B1} = -10\text{ mA}, I_{B2} = 20\text{ mA},$ Duty Cycle $\leq 1\%$	—	0.2	

Marking







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20070701-EN

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