

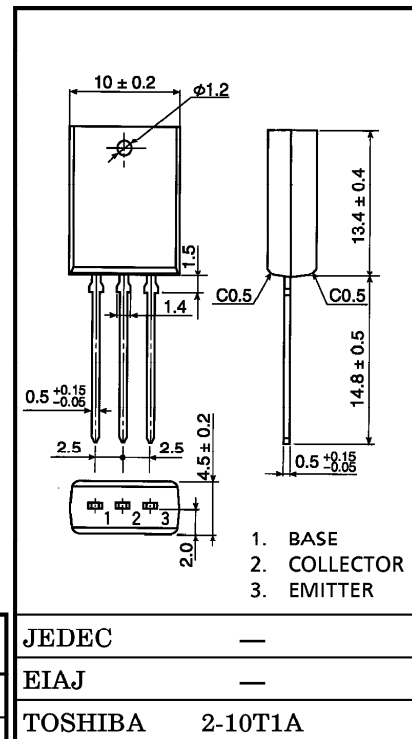
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

# 2SC5176

HIGH CURRENT SWITCHING APPLICATIONS  
DC-DC CONVERTER APPLICATIONS

INDUSTRIAL APPLICATIONS

- Low Collector Saturation Voltage  
:  $V_{CE(sat)} = 0.4V$  (Max.) (at  $I_C = 3A$ )
- High Speed Switching Time :  $t_{stg} = 1.0\mu s$  (Typ.)



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		$V_{CBO}$	100	V
Collector-Emitter Voltage		$V_{CEO}$	80	V
Emitter-Base Voltage		$V_{EBO}$	7	V
Collector Current	DC	$I_C$	5	A
	Pulse	$I_{CP}$	8	
Base Current		$I_B$	1	A
Collector Power Dissipation		$P_C$	1.8	W
Junction Temperature		$T_j$	150	°C
Storage Temperature Range		$T_{stg}$	-55~150	°C

Weight : 1.5g

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		$I_{CBO}$	$V_{CB} = 100V, I_E = 0$	—	—	1	$\mu A$
Emitter Cut-off Current		$I_{EBO}$	$V_{EB} = 7V, I_C = 0$	—	—	1	$\mu A$
Collector-Emitter Breakdown Voltage		$V_{(BR) CEO}$	$I_C = 10mA, I_B = 0$	80	—	—	V
DC Current Gain		$h_{FE} (1)$ (Note)	$V_{CE} = 1V, I_C = 1A$	70	—	240	
		$h_{FE} (2)$	$V_{CE} = 1V, I_C = 3A$	40	—	—	
Saturation Voltage	Collector-Emitter	$V_{CE (sat)}$	$I_C = 3A, I_B = 0.15A$	—	0.2	0.4	V
	Base-Emitter	$V_{BE (sat)}$	$I_C = 3A, I_B = 0.15A$	—	0.9	1.2	
Transition Frequency		$f_T$	$V_{CE} = 4V, I_C = 1A$	—	120	—	MHz
Collector Output Capacitance		$C_{ob}$	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	80	—	pF
Switching Time	Turn-on Time	$t_{on}$	<p> <math>20\mu s</math> INPUT <math>I_{B1}</math> OUTPUT  <math>I_{B1}</math> <math>I_{B2}</math> <math>10\Omega</math> <math>V_{CC} = 30V</math>  <math>I_{B1} = -I_{B2} = 0.15A</math>                      DUTY CYCLE <math>\leq 1\%</math> </p>	—	0.2	—	$\mu s$
	Storage Time	$t_{stg}$		—	1.0	—	
	Fall Time	$t_f$		—	0.1	—	

Note :  $h_{FE} (1)$  Classification    O : 70~140,    Y : 120~240

