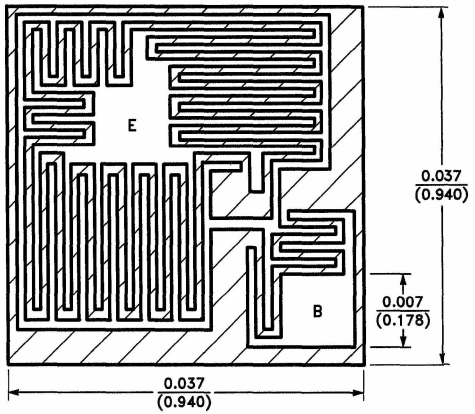
National Semiconductor

Process 06
NPN Darlington



TL/G/10034–4

DESCRIPTION

Process 06 is a monolithic, double-diffused, silicon epitaxial Darlington.

APPLICATION

This device is designed for applications requiring extremely high current gain at collector currents up to 1.5A and high breakdown voltage.

PRINCIPLE DEVICE TYPES

TO-202 EBC: NSDU45A

TO-226 EBC: 2N7053

TO-237 EBC: 92PU45A

TO-92 EBC: 2N7052

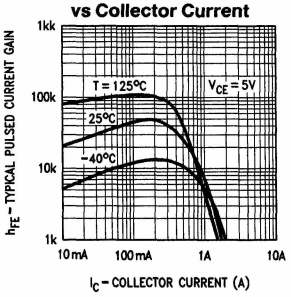
TO-92 ECB: 2N7051

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

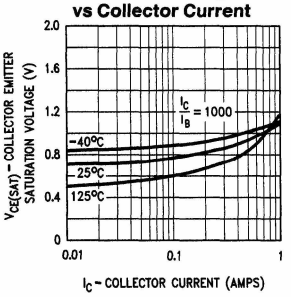
Symbol	Conditions	Min	Typ	Max	Units
BV_{CEO}	I_C = 1 mA, I_B = 0	100			V
BV_{EBO}	I_E = 1 mA, I_C = 0	12			V
I_{CBO}	V_{CB} = 80V, I_E = 0			100	nA
I_{CES}	V_{CE} = 80V, V_{BE} = 0			100	nA
I_{EBO}	V_{EB} = 7V			100	nA
h_{FE}	I_C = 10 mA, V_{CE} = 5V I_C = 100 mA, V_{CE} = 5V I_C = 1A, V_{CE} = 5V	1,000 10,000 500	40,000	20,000 200,000	
$V_{CE(s)}$	I_C = 100 mA, I_B = 0.1 mA		0.75	1.1	V
$V_{BE(s)}$	I_C = 100 mA, I_B = 0.1 mA		1.3	1.5	V
C_{cb}	V_{CB} = 10V, I_E = 0, f = 1 MHz		3	6	pF
C_{ib}	V_{EB} = 0.5V, I_E = 0, f = 1 MHz		14	20	pF
h_{fe}	I_C = 100 mA, V_{CE} = 5V, f = 20 MHz		8		
$P_{D(max)}$					
TO-202	T_C = 25°C	12			W
	T_A = 25°C	2			W
TO-226	T_A = 25°C	1			W
TO-237	T_C = 25°C	2			W
	T_A = 25°C	850			mW
TO-92	T_A = 25°C	700			mW
$T_{J(max)}$	All Plastic Parts	150			°C

Process 06

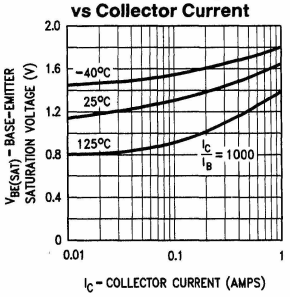
Typical Pulse Current vs Collector Current



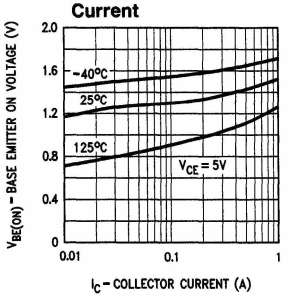
Collector-Emitter Saturation Voltage vs Collector Current



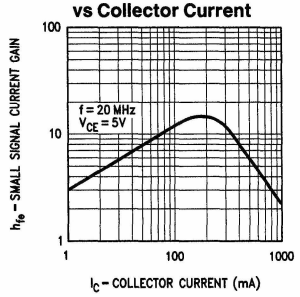
Base-Emitter Saturation Voltage vs Collector Current



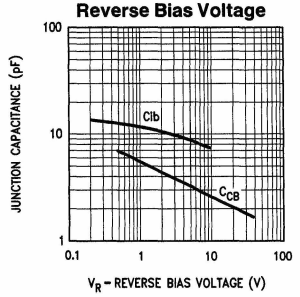
Base-Emitter on Voltage vs Collector Current



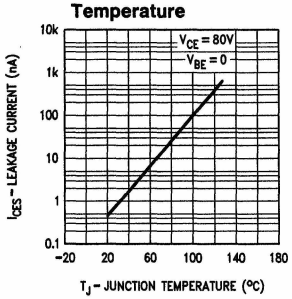
Small Signal Current Gain vs Collector Current



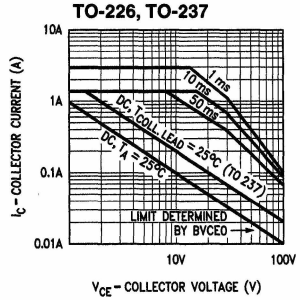
Junction Capacitance vs Reverse Bias Voltage



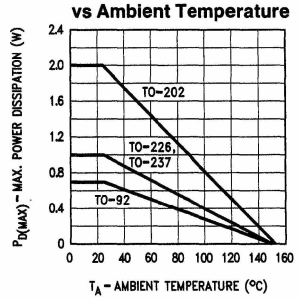
Typical Collector-Emitter Leakage Current vs Temperature



Safe Operating Area TO-226, TO-237



Maximum Power Dissipation vs Ambient Temperature



TL/G/10034-5