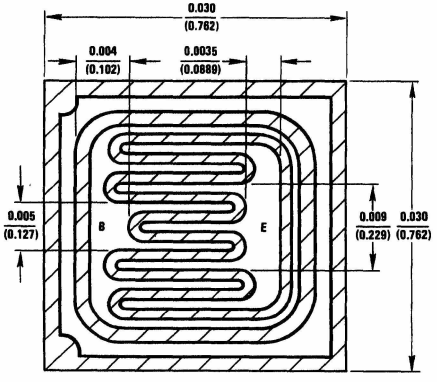
National Semiconductor

Process 70
PNP Memory Driver



TL/G/10038–35

DESCRIPTION

Process 70 is a non-overlay, double-diffused, gold doped, silicon epitaxial device. Complement to Process 25.

APPLICATION

This device was designed primarily for high speed saturated switching applications to currents of 1A.

PRINCIPAL DEVICE TYPES

TO-39 EBC: 2N3467

TO-237 EBC: TN3467

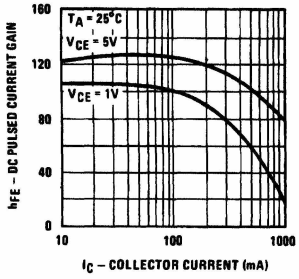
TO-116: MPQ3467

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

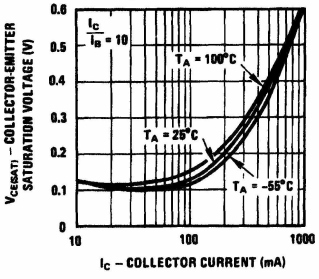
Symbol	Conditions	Min	Typ	Max	Units
t_{ON}	I_C = 500 mA, I_{B1} = 50 mA *(Figure 1)*		20	40	ns
t_{OFF}	I_C = 500 mA, I_{B2} = 50 mA *(Figure 2)*		60	90	ns
C_{ob}	V_{CB} = −10V		15	20	pF
C_{ib}	V_{EB} = −0.5V			80	pF
h_{FE}	I_C = 100 mA, V_{CE} = −1V	40	100	200	
	I_C = 500 mA, V_{CE} = −1V	30		120	
	I_C = 1A, V_{CE} = −1V	15			
$V_{CE(SAT)}$	I_C = 150 mA, I_B = 15 mA			0.3	V
	I_C = 500 mA, I_B = 50 mA			0.6	V
	I_C = 1A, I_B = 100 mA			1.0	V
$V_{BE(SAT)}$	I_C = 150 mA, I_B = 50 mA			1.2	V
	I_C = 500 mA, I_B = 50 mA			1.2	V
	I_C = 1A, I_B = 100 mA			1.7	V
BV_{CEO}	I_C = 10 mA	40			V
BV_{CBO}	I_C = 100 μA	50			V
BV_{EBO}	I_E = 10 μA	6			V
I_{CBO}	V_{CB} = 30V			100	nA
I_{EBO}	V_{EB} = 4V			100	nA
$P_{D(max)}$					
TO-39	T_C = 25°C	7			W
	T_A = 25°C	1			W
TO-237	T_C = 25°C	2			W
	T_A = 25°C	850			mW
TO-116	T_A = 25°C				
	(Total Dissipation)	1			W
	(Each Transistor)	600			mW
$T_{J(max)}$	All Metal Can Parts	200			°C
	All Plastic Parts	150			°C

Process 70

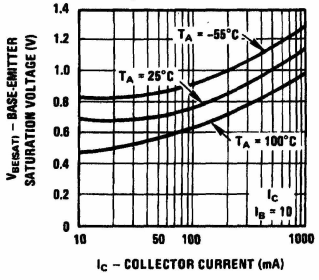
DC Pulsed Current Gain vs Collector Current



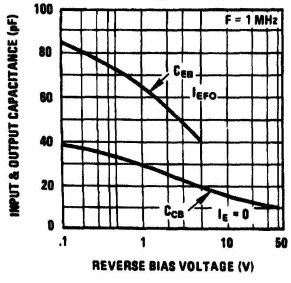
Collector-Emitter Saturation Voltage vs Collector Current



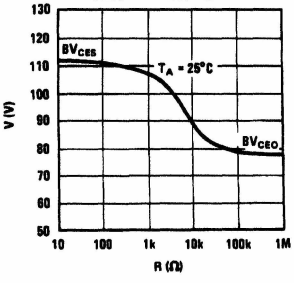
Base-Emitter Saturation Voltage vs Collector Current



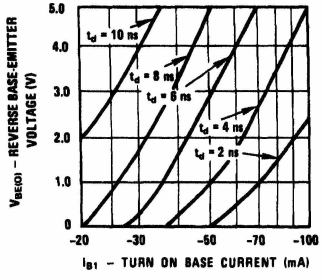
Input and Output Capacitance vs Reverse Bias Voltage



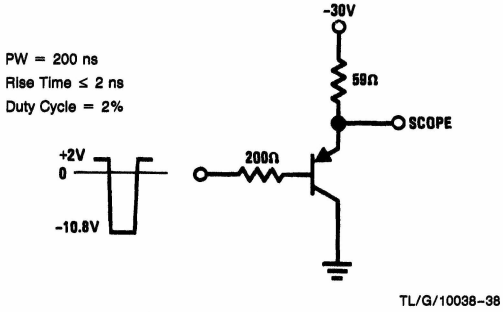
BV_{CER} vs R_{BE}, I_C = 10 mA



Delay Time vs Turn On Base Current and Reverse Base-Emitter Voltage

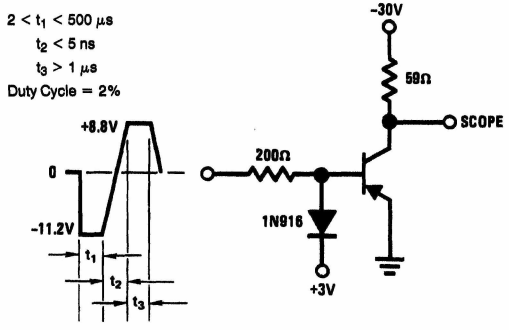


TL/G/10038–36



TL/G/10038–38

FIGURE 1. t_{ON} Equivalent Test Circuit

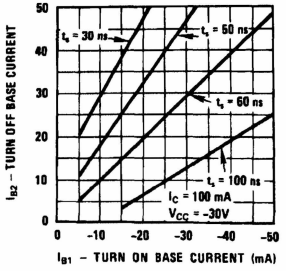


TL/G/10038–39

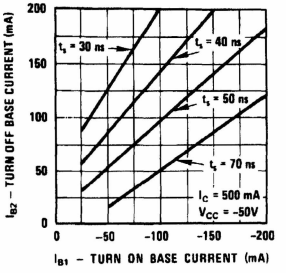
FIGURE 2. t_{OFF} Equivalent Test Circuit

Process 70

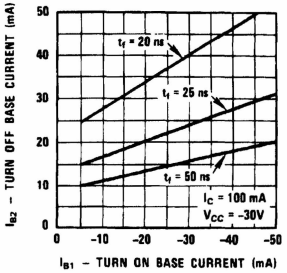
Storage Time vs Turn On and Turn Off Base Currents



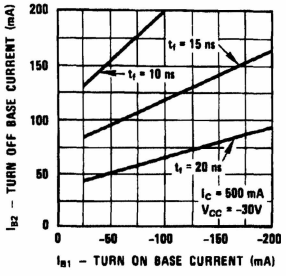
Storage Time vs Turn On and Turn Off Base Currents



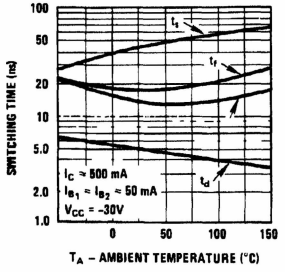
Fall Time vs Turn On and Turn Off Base Currents



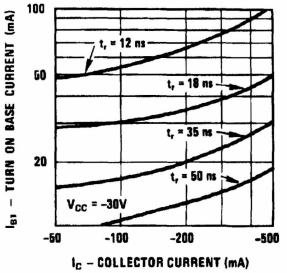
Fall Time vs Turn On and Turn Off Base Currents



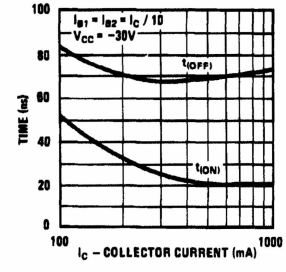
Switching Times vs Ambient Temperature



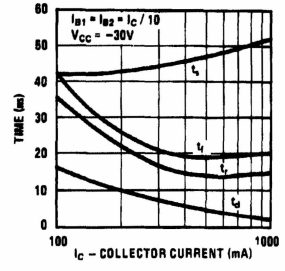
Rise Time vs Collector Current and Turn On Base Current



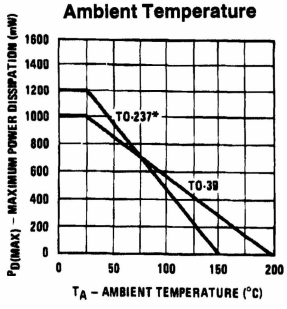
Turn On and Turn Off Times vs Collector Current



Switching Times vs Collector Current

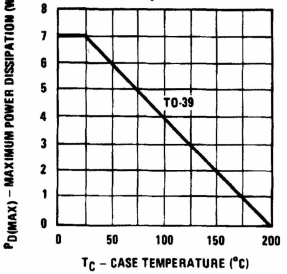


Maximum Power Dissipation vs Ambient Temperature



* One square inch of copper run

Maximum Power Dissipation vs Case Temperature



TL/G/10038–37