New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

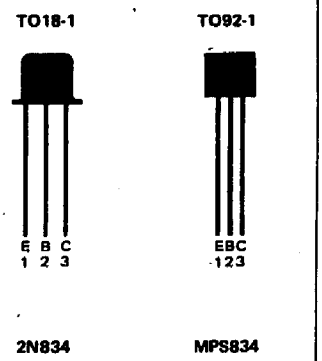
2N834 • MPS834

NPN HIGH SPEED SATURATED LOGIC SWITCHES

DIFFUSED SILICON PLANAR* EPITAXIAL TRANSISTORS

- P_D . . . 625 mW @ T_A = 25°C (MPS834)
- t_{on} . . . 16 ns (MAX) @ 10 mA (MPS834)
- t_{off} . . . 30 ns (MAX) @ 10 mA (MPS834)
- t_s . . . 25 ns (MAX) @ 10 mA
- COMPLEMENTS . . . 2N408 (TO18), MPSL08 (TO92)

See Package Outlines



ABSOLUTE MAXIMUM RATINGS (Note 1)

		2N834	MPS834
Maximum Temperatures			
Storage Temperature		−65°C to 175°C	−55°C to 150°C
Operating Junction Temperature		175°C	150°C
Lead Temperature (10 seconds)		240°C	260°C
Maximum Power Dissipation (Notes 2 & 3)		2N834	MPS834
Total Dissipation at 25°C Ambient Temperature		0.300 W	0.625 W
at 25°C Case Temperature		1.0 W	1.0 W
Maximum Voltages and Current			
V_{CBO}	Collector to Base Voltage		40 V
V_{CES}	Collector to Emitter Voltage		30 V
V_{EBO}	Emitter to Base Voltage		5.0 V
I_C	Collector Current		200 mA

ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)

SYMBOL	CHARACTERISTIC	2N834 MIN.	2N834 MAX.	MPS834 MIN.	MPS834 MAX.	UNITS	TEST CONDITIONS
BV_{CBO}	Collector to Base Breakdown Voltage	40				V	I_C = 100 μA, I_E = 0
				40		V	I_C = 10 μA, I_E = 0
BV_{EBO}	Emitter to Base Breakdown Voltage	5.0				V	I_E = 100 μA, I_C = 0
				5.0		V	I_E = 10 μA, I_C = 0
I_{CES}	Collector Cutoff Current		10		10	μA	V_{CE} = 30 V, V_{BE} = 0
I_{CBO}	Collector Cutoff Current		500		500	nA	V_{CB} = 20 V, I_E = 0
			30			μA	V_{CB} = 20 V, I_E = 0, T_A = 150°C
h_{FE}	DC Current Gain (Note 4)	25		25			I_C = 10 mA, V_{CE} = 1.0 V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Note 4)		0.25		0.25	V	I_C = 10 mA, I_B = 1.0 mA
			0.4		0.4	V	I_C = 50 mA, I_B = 5.0 mA
$V_{BE(sat)}$	Base to Emitter Saturation Voltage (Note 4)		0.9		0.9	V	I_C = 10 mA, I_B = 1.0 mA
f_T	Current Gain Bandwidth Product	350				MHz	I_C = 10 mA, V_{CE} = 15 V, f = 100 MHz
				350		MHz	I_C = 10 mA, V_{CE} = 20 V, f = 100 MHz
C_{ob}	Output Capacitance		4.0		4.0	pF	V_{CB} = 10 V, I_E = 0, f = 100 kHz
t_{on}	Turn On Time (see test circuit no. 566)		35		16	ns	I_C = 10 mA, I_{B1} = 3.0 mA, V_{CC} = 3.0 V
t_{off}	Turn Off Time (see test circuit no. 566)		75		30	ns	I_C = 10 mA, I_{B1} = 3.0 mA, I_{B2} = 1.0 mA, V_{CC} = 3.0 V
τ_s	Storage Time (see test circuit no. 567)		25		25	ns	I_C = 10 mA, I_{B1} = I_{B2} = 10 mA, V_{CC} = 10 V

*Planar is a patented Fairchild process.

NOTES:

1. These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
3. These ratings give a maximum junction temperature of 175°C and junction to case thermal resistance of 150°C/W (derating factor of 6.67 mW/°C); junction to ambient thermal resistance of 500°C/W (derating factor of 2.0 mW/°C) for 2N834. These ratings give a maximum junction temperature of 150°C and junction to case thermal resistance of 125°C/W (derating factor of 8.0 mW/°C); junction to ambient thermal resistance of 200°C/W (derating factor of 5.0 mW/°C) for MPS834.
4. Pulse conditions: length = 300 μs; duty cycle = ≤ 2%.
5. For product family characteristic curves, refer to Section 5 – SS28.