

# POWER TRANSISTORS

## 0.1 Amp, 500V, Planar NPN, Plastic

UPTB520  
UPTB530  
UPTB540  
UPTB550

T-35-19

### FEATURES

- Designed for High Speed Switching Applications
- Collector-Emitter Voltage: up to 500V
- Peak Collector Current: to .2A
- Economical Plastic Molded Construction

### DESCRIPTION

Unitrode high voltage power transistors provide a unique combination of low saturation voltage, high gain and fast switching. They are ideally suited for pulse power applications in power supplies, thermal printers, solid state relays and pulse amplifiers.

### ABSOLUTE MAXIMUM RATINGS

	UPTB520	UPTB530	UPTB540	UPTB550
Collector-Base Voltage, $V_{CBO}$	250V	350V	450V	550V
Collector-Emitter Voltage, $V_{CEO}$	200V	300V	400V	500V
Emitter-Base Voltage, $V_{EBO}$	5V	5V	5V	5V
D.C. Collector Current, $I_C$	.1A	.1A	.1A	.1A
Peak Collector Current, $I_{Cp}$	.2A	.2A	.2A	.2A
Base Current, $I_B$	.1A	.1A	.1A	.1A
Power Dissipation				
25°C Case			2.4W	
25°C Ambient			750mW	
Thermal Resistance, $\theta_{J-C}$			62.5°C/W	
Thermal Resistance, $\theta_{J-A}$			200°C/W	
Storage Temperature Range			-55°C to +150°C	
Maximum Junction Temperature			+175°C	

### MECHANICAL SPECIFICATIONS

UPTB520 UPTB530 UPTB540 UPTB550

	INCHES	MILLIMETERS
A	.135 MIN.	3.42 MIN.
B	.170 - .210	4.31 - 5.33
C	.500 MIN.	12.70 MIN.
D	.016 - .019	.406 - .482
E	.175 - .205	4.44 - 5.21
F	.125 - .165	3.17 - 4.19
G	.080 - .105	2.03 - 2.66
H	.095 - .105	2.41 - 2.66
J	.045 - .055	1.14 - 1.40

TO-92

www.DataSheet4U.com

www.DataSheet4U.com

3/78

8-51

**U** SEMICONDUCTOR  
PRODUCTS  
**UNITRODE**

T-35-19

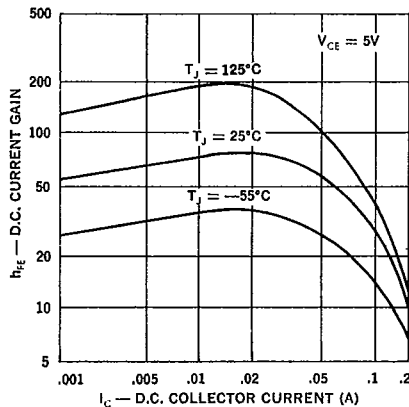
ELECTRICAL SPECIFICATIONS (at 25°C unless noted)

Test	Symbol	Min.	Max.	Units	Test Conditions
D.C. Current Gain (Note 1)	$h_{FE}$	20	—	—	$I_C = 25mA, V_{CE} = 5Vdc$
D.C. Current Gain (Note 1)	$h_{FE}^{(sat)}$	5	—	—	$I_C = 100mA, V_{CE} = 5Vdc$
Collector Saturation Voltage (Note 1)	$V_{CE}^{(sat)}$	—	1.2	Vdc	$I_C = 50mA, I_B = 10mA$
	$V_{CE}^{(sat)}$	—	1.0	Vdc	$I_C = 20mA, I_B = 2mA$
Base Saturation Voltage (Note 1)	$V_{BE}^{(sat)}$	—	1.5	Vdc	$I_C = 50mA, I_B = 10mA$
Collector-Base Breakdown Voltage (Note 1)	$BV_{CBO}$			Vdc	$I_C = 10\mu Adc$
UPTB520		250	—		
UPTB530		350	—		
UPTB540		450	—		
UPTB550		550	—		
Collector-Emitter Breakdown Voltage (Note 1)	$BV_{CEO}$			Vdc	$I_C = 1mA dc$
UPTB520		200	—		
UPTB530		300	—		
UPTB540		400	—		
UPTB550		500	—		
Collector-Emitter Cutoff Current	$I_{CES}$	—	10	$\mu Adc$	$V_{CE} = \text{rated } BV_{CEO}, V_{BE} = 0$
Collector-Emitter Cutoff Current	$I_{CES}$	—	1	mAdc	$V_{CE} = \text{rated } BV_{CEO}, T = 125^\circ C, V_{BE} = 0$
Emitter-Base Cutoff Current	$I_{EBO}$	—	50	$\mu Adc$	$V_{EB} = 5Vdc$
Output Capacitance	$C_{ob}$	—	50	pf	$V_{CB} = 10Vdc, I_E = 0, f = 1MHz$
Gain-Bandwidth Product	$f_T$	15	—	MHz	$I_C = 1Adc, V_{CE} = 5Vdc, f = 10MHz$
Rise Time	$t_r$	100 Typ.		ns	$I_C = 100mA$
Delay Time	$t_d$	50 Typ.		ns	
Storage Time	$t_s$	200 Typ.		ns	
Fall Time	$t_f$	1000 Typ.		ns	

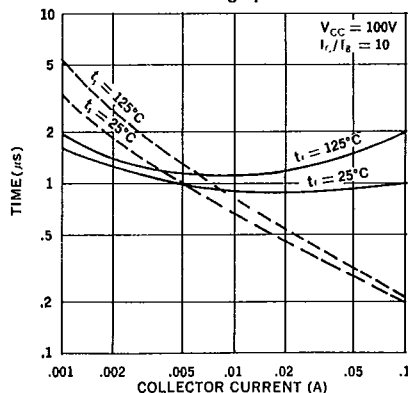
Note 1. Pulse width = 300 $\mu$ s; duty cycle  $\leq$  2%.

Note 2. For thermal considerations for operating UPTB520, UPTB530, UPTB540 and UPTB550, refer to Application Note U-77.

D.C. Current Gain vs. Collector Current



Switching Speeds



Switching Speed Circuit

