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.

8

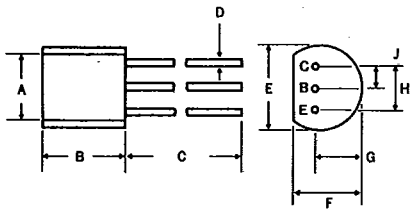
ABSOLUTE MAXIMUM RATINGS

	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_C	.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, θ_{J-C}	62.5°C/W
Thermal Resistance, θ_{J-A}	200°C/W
Storage Temperature Range	−55°C to +150°C
Maximum Junction Temperature	+175°C

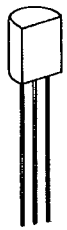
MECHANICAL SPECIFICATIONS

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



T-35-19

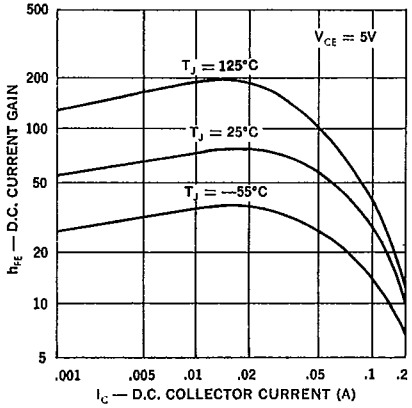
ELECTRICAL SPECIFICATIONS (at 25°C unless noted)

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}	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	$I_C = 1mAdc$
UPTB520		200	—		
UPTB530		300	—		
UPTB540		400	—		
UPTB550		500	—		
Collector-Emitter Cutoff Current	I_{CES}	—	10	μAdc	V_{CE} = rated BV_{CEO}, $V_{BE} = 0$
Collector-Emitter Cutoff Current	I_{CES}	—	1	mAdc	V_{CE} = rated BV_{CEO}, $T = 125°C$, $V_{BE} = 0$
Emitter-Base Cutoff Current	I_{EBO}	—	50	μAdc	$V_{EB} = 5Vdc$
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	

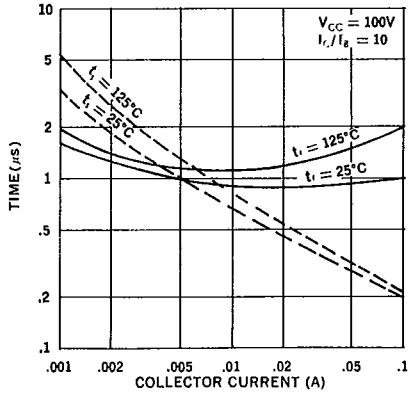
Note: 1. Pulse width = 300μs; duty cycle ≤ 2%.

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

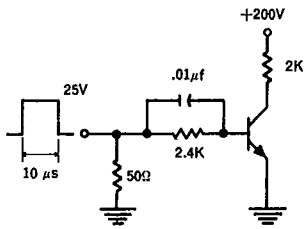
D.C. Current Gain vs. Collector Current



Switching Speeds



Switching Speed Circuit



UNITRODE • SEMICONDUCTOR PRODUCTS
580 PLEASANT STREET • WATERTOWN, MA 02172
TEL. (617) 926-0404 • FAX (617) 924-1235