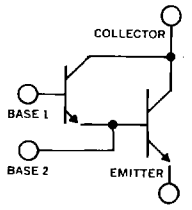
POWER DARLINGTONS

10 Amp, 150V, Planar NPN

U2T101
U2T105
U2T201
U2T205

FEATURES

- High Current Gain: up to 2000 min @ $I_C = 5A$
- Low Saturation Voltage: as low as 1.5V max @ $I_C = 5A$
- High Voltage: up to 150V min V_{CER}
- Monolithic Design Incorporating Multiple-Emitter Techniques
- Triple-Diffused Planar Construction



DESCRIPTION

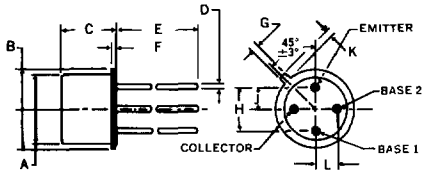
Unitrode NPN Darlingtons consist of a two transistor circuit on a single monolithic planar chip.

ABSOLUTE MAXIMUM RATINGS

	TO-33		3 PIN TO-66	
	U2T101	U2T105	U2T201	U2T205
Collector-Emitter Voltage	80V	150V	80V	150V
Emitter Base Voltages,				
V_{EB2}	6V	6V	6V	6V
V_{EB1}	12V	12V	12V	12V
D.C. Collector Current	5A	5A	5A	5A
Peak Collector Current	10A	10A	10A	10A
Base 1 Current	0.5A	0.5A	0.5A	0.5A
Power Dissipation				
25°C Ambient	1W	1W	2.5W	2.5W
100°C Case	5W	5W	25W	25W
Thermal Resistance, Junction to Case	20°C/W		4°C/W	
Operating and Storage Temperature Range	−65°C to 200°C		−65°C to 200°C	

MECHANICAL SPECIFICATIONS

U2T101 U2T105

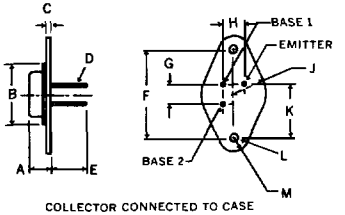


COLLECTOR CONNECTED TO CASE

	ins.	mm
A	.305-.335	7.75-8.51
B	.335-.370	8.51-9.40
C	.240-.260	6.10-6.60
D	.017 +.002 −.001	.432 +.051 −.025
E	1.5 MIN	38.10 MIN
F	.018 MAX	.046 MAX
G	.031 ± .003	.079 ± .08
H	.200	1.02
J	.100	2.54
K	.029-.045	.074-1.14
L	.100	2.54

TO-33

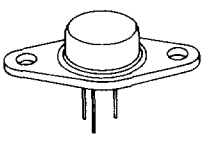
U2T201 U2T205



COLLECTOR CONNECTED TO CASE

	ins	mm
A	.250-.340	6.35-8.64
B	.620 MAX	15.75 MAX
C	.050-.075	1.27-1.91
D	.028-.034	.71-.86
E	.360 MIN	9.14 MIN
F	.958-.962	24.33-24.43
G	.190-.210	4.83-5.33
H	.190-.210	4.83-5.33
J	.350 MAX RAD	8.89 MAX RAD
K	.570-.590	14.48-14.99
L	.142-.152	3.61-3.86
M	.145 MAX RAD	3.68 MAX RAD

3 Pin TO-66



UNITRODE

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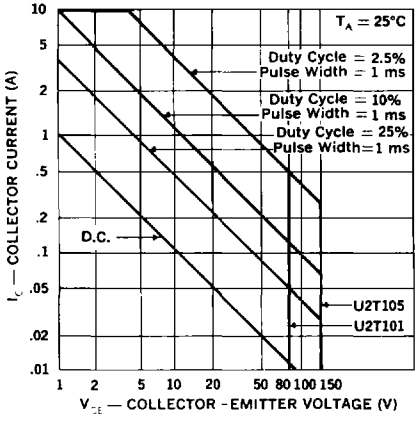
ELECTRICAL SPECIFICATIONS (at 25°C unless noted)

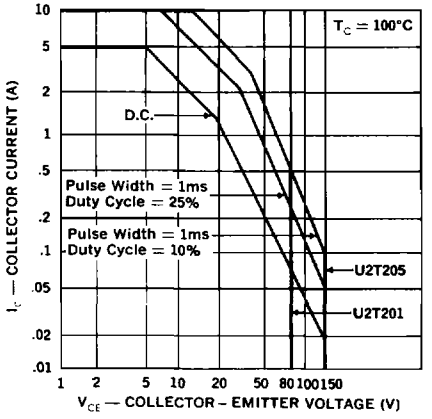
Test	Symbol	U2T101 & U2T201 Min.	U2T101 & U2T201 Max.	U2T105 & U2T205 Min.	U2T105 & U2T205 Max.	Units	Test Conditions
D.C. Current Gain (Note 1)	h_{FE}	2000	—	1000	—	—	$I_C = 1.0A$, $V_{CE} = 2V$, $R_{B2E} = 1K$
D.C. Current Gain (Note 1)	h_{FE}	2000	—	1000	—	—	$I_C = 5A$, $V_{CE} = 5V$, $R_{B2E} = 100$
Collector Saturation Voltage (Note 1)	V_{CE} (sat)	—	1.5	—	2.5	V	$I_C = 5A$, $R_{B2E} = 100$ U2T101, 201: $I_{B1} = 5mA$ U2T105, 205: $I_{B1} = 10mA$
Collector-Emitter Breakdown Voltage (Note 1)	BV_{CER}	80	—	150	—	V	$I_C = 25mA$, $R_{B1E} = 2.2K$, $R_{B2E} = 100$
Collector Cutoff Current	I_{CER}	—	1.0	—	1.0	μA	$R_{B1E} = 2.2K$, $R_{B2E} = 100$ U2T101, 201: $V_{CE} = 80V$ U2T105, 205: $V_{CE} = 150V$
Collector Cutoff Current	I_{CER}	—	1.0	—	1.0	mA	$R_{B1E} = 2.2K$, $R_{B2E} = 100$, $T = 150°C$ U2T101, 201: $V_{CE} = 80V$ U2T105, 205: $V_{CE} = 150V$
Collector Capacitance	C_{obo}	—	100	—	100	pf	$V_{CB} = 10$, $I_E = 0$, $f = 1MHz$
A.C. Current Gain	h_{fe}	5	—	5	—	—	$I_C = 1.0A$, $V_{CE} = 10V$, $f = 10MHz$, $R_{B2E} = 100$
Switching Speeds — Delay Time	t_d	100 Typ.		100 Typ.		ns	$V_{CC} = 30V$,
Switching Speeds — Rise Time	t_r	300 Typ.		400 Typ.		ns	$I_C = 5A$,
Switching Speeds — Storage Time	t_s	600 Typ.		500 Typ.		ns	U2T101, 201: I_B (on) = I_B (off) = 5mA,
Switching Speeds — Fall Time	t_f	500 Typ.		500 Typ.		ns	U2T105, 205: I_B (on) = I_B (off) = 10mA, $R_{B2E} = 100$

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

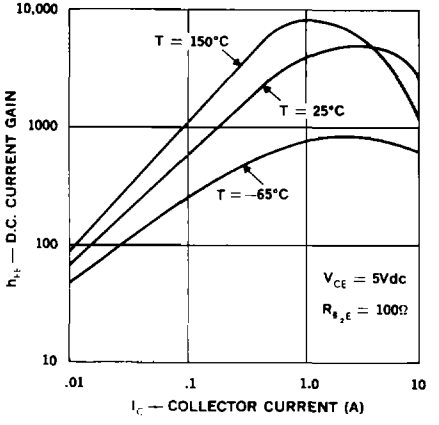
Maximum Safe Operating Area
U2T101 & 105



Maximum Safe Operating Area
U2T201 & 205



D.C. Current Gain vs. Collector Current
U2T101, U2T105, U2T201, U2T205



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