100W
HIGH VOLTAGE DARLINGTON TRANSISTORS
300-500V
COLLECTOR-EMITTER VOLTAGE

DT4335
DT4336
DT5335
DT5336

The DT4335/6 and DT5335/6 are NPN double epitaxial devices conforming to JEDEC TO-3/TO-204.

They are high power, high voltage, high gain devices suitable for use in power switching applications.

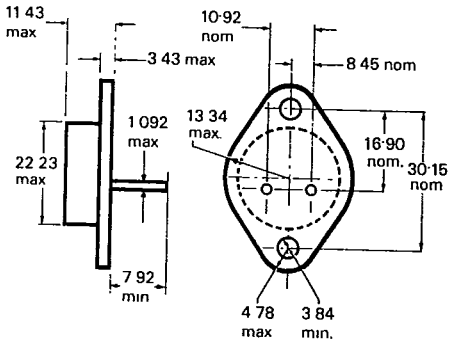
Variants are available with a collector pin welded to the case.

QUICK REFERENCE DATA

	DT4335	DT4336	DT5335	DT5336
V_{CBO} max.	300V	500V	300V	500V
$V_{CEO(sus)}$ min.	250V	400V	250V	400V
I_{CM} max.	12A	12A	20A	20A
h_{FE} min. at I_C=5A, V_{CE}=2V and T_{case}=25°C	100			
t_r typ.	1·4μs			

Outline and Dimensions

JEDEC TO-3/TO-204



All dimensions in millimetres
For detail dimensions see Page 6

2704 D-11

In the interest of improved product design, changes to this specification may be made at any time.

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RATINGS

The ratings quoted are limiting values of operating and environmental conditions and are in accordance with the absolute maximum rating system defined in BS 3494 (Part 1) and IEC Publication 134.

Voltage Ratings

		DT4335	DT4336	DT5335	DT5336
V_{CBO}	Collector-base voltage at $I_E=0$	300V	500V	300V	500V
V_{CEO}	Collector-emitter voltage at $I_B=0$	300V	500V	300V	500V
V_{EBO}	Emitter-base voltage at $I_C=0$	5V			

Current Ratings

I_C	Continuous collector current	6A	6A	10A	10A
I_{CM}	Peak collector current	12A	12A	20A	20A
I_B	Continuous base current	2A			

Power Rating

P_{tot}	Total power dissipation at $T_{case}=25°C$	100W

Thermal Ratings

T_{case}	Operating case temperature range	−40°C to +165°C
T_{stg}	Storage temperature range	−55°C to +175°C

CHARACTERISTICS

Electrical Characteristics

		Min.	Typ.	Max.
I_{CEO}	Collector-emitter leakage current at $V_{CE}=V_{CEO}$max, $I_B=0$ and $T_{case}=25°C$			5·0mA
I_{CBO}	Collector-base leakage current at $V_{CB}=V_{CBO}$max, $I_E=0$ and $T_{case}=25°C$			5·0mA
I_{EBO}	Emitter-base leakage current at $V_{EB}=V_{EBO}$max, $I_C=0$ and $T_{case}=25°C$			20mA
h_{FE}	D.C. current gain			
	$I_C=5A$, $V_{CE}=2V$ and $T_{case}=25°C$	100		1000
	$I_C=10A$, $V_{CE}=2V$ and $T_{case}=25°C$	20		200
$V_{CEO(sus)}$	Collector-emitter sustaining voltage at $I_C=5A$			
	DT4336/DT5336	400V		
	DT4335/DT5335	250V		
$V_{CE(sat)}$	Collector-emitter saturation voltage			
	$I_C=6·5A$, $I_B=150mA$ and $T_{case}=25°C$			1·7V
	$I_C=4·5A$, $I_B=150mA$ and $T_{case}=25°C$			1·8V
$V_{BE(sat)}$	Base-emitter saturation voltage			
	$I_C=6·5A$, $I_B=150mA$ and $T_{case}=25°C$			2·2V
	$I_C=4·5A$, $I_B=150mA$ and $T_{case}=25°C$			2·2V

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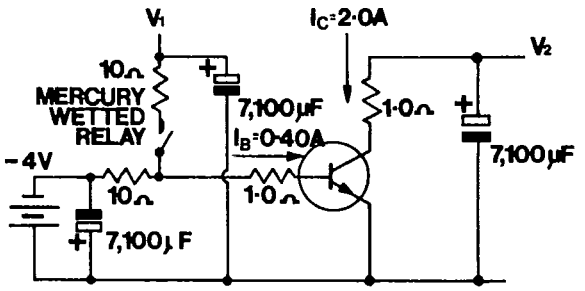
81C 00166 D T-33-27

Switching Times

		Min.	Typ.	Max.
(Measured in the circuit shown below)				
t_d	Delay time		0·1μs	
t_r	Rise time		1·4μs	
t_s	Storage time		0·9μs	
t_f	Fall time		8·0μs	

Switching Circuit

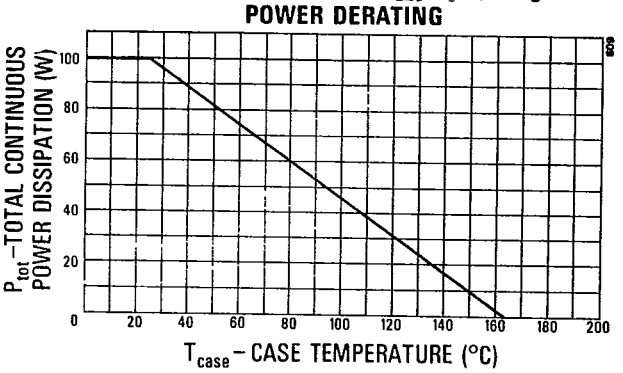
V_1 is adjusted to give 0·40A base current in the 'on' condition and V_2 to give 2·0A collector current.



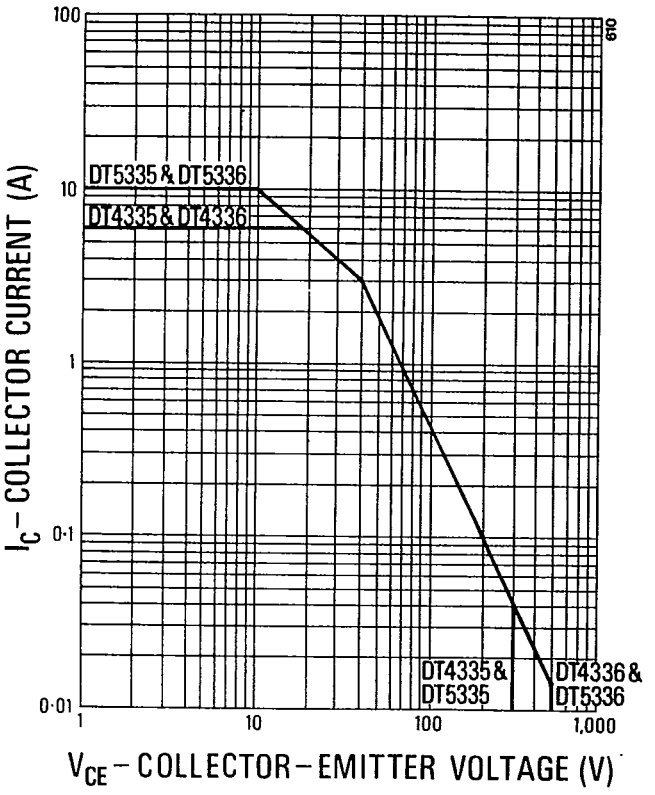
Thermal Characteristics

		Min.	Typ.	Max.
$R_{th(j\text{-}case)}$	Thermal resistance (junction to case)			1·4 deg C/W

POWER DERATING



D.C. SAFE OPERATING AREA RATING



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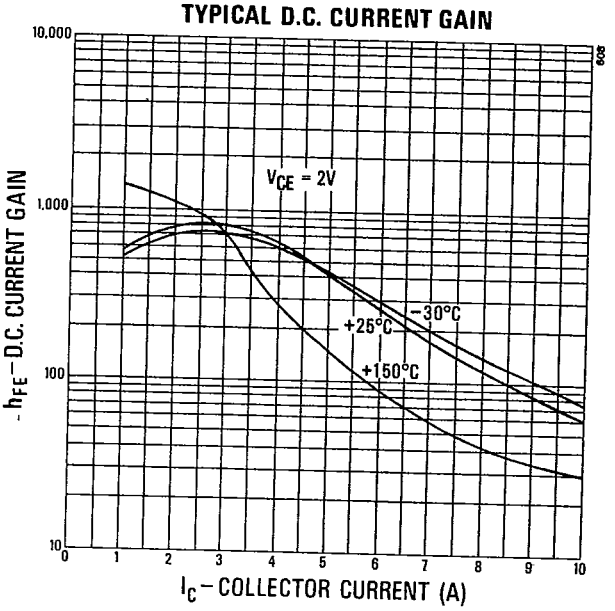
TYPICAL D.C. CURRENT GAIN



MECHANICAL DETAILS

Outline and Dimensions

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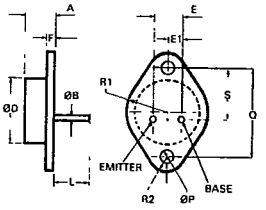

Ref.	Millimetres		Inches		Notes
	Min.	Max.	Min.	Max.	
A	6·35	11·43	0·250	0·450	
ØB	0·966	1·092	0·038	0·043	
ØD		22·23		0·875	
E	10·68	11·16	0·420	0·440	
E1	5·21	5·72	0·205	0·225	
F	1·52	3·43	0·060	0·135	
L	7·92	12·70	0·312	0·500	
ØP	3·84	4·089	0·151	0·161	
Q	29·90	30·40	1·177	1·197	
R1	12·57	13·34	0·495	0·525	
R2	3·33	4·78	0·131	0·188	
S	16·64	17·14	0·655	0·675	

Notes:

1. The transistors comply with JEDEC TO-3/TO-204 outline.
2. The collector is internally connected to the case.
3. Variants with collector pin welded to the case are available.
4. The millimetre dimensions are derived from the inch dimensions.

Weight 8 grammes.

INSTALLATION NOTES

To obtain good thermal contact between the transistor and heat sink:

(a) Remove all burrs from the edges of clearance holes in the heat sink.

(b) Use a small amount of silicone grease either between the transistor and heat sink, or (when applicable) on each side of the mica insulating washer.

(c) Apply the correct torque to the mounting screws on assembly. Minimum torque for good thermal contact 0·4-0·6Nm (3·5-5·5 lbf in).

Transistor pins must not be bent.

The pins may be dip-soldered at a temperature of 240°C for a maximum of 10 seconds up to 2·5 mm from the body.

For use in applications which require the transistor to be electrically insulated from the heat sink, the appropriate insulating kit is identified below.

Transistor	Insulating kit Part No.
Standard TO-3/TO-204 outline	MK 108
TO-3/TO-204 with collector pin	MK 115

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