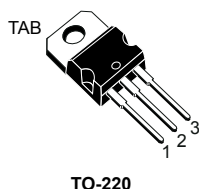


Low voltage complementary power transistors



Features

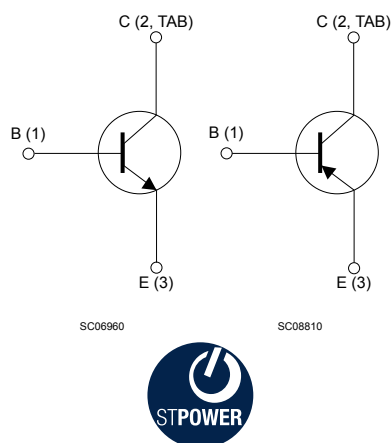
- Complementary PNP-NPN devices
- New enhanced series
- High switching speed
- h_{FE} grouping
- h_{FE} improved linearity

Application

- General purpose circuits
- Audio amplifier
- Power linear and switching

Description

The TIP41C is a base island technology NPN power transistor in TO-220 plastic package that makes this device suitable for audio, power linear, and switching applications. The complementary PNP type is TIP42C.



Product status link

[TIP41C](#)

[TIP42C](#)

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage ($I_E = 0$ A)	100	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$ A)	100	V
V_{EBO}	Collector-base voltage ($I_C = 0$ A)	5	V
I_C	Collector current	6	A
I_{CM}	Collector peak current	10	A
I_B	Base current	3	A
P_{TOT}	Total power dissipation at $T_C = 25$ °C	65	W
T_{stg}	Storage temperature range	-65 to 150	°C
T_J	Maximum operating junction temperature	150	°C

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance, junction-to-case	1.92	°C/W
R_{thJA}	Thermal resistance, junction-to-ambient	62.5	°C/W

Note: For PNP types voltage and current values are negative.

2 Electrical characteristics

$T_C = 25^\circ\text{C}$ unless otherwise specified.

Table 3. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector cut-off current	$I_B = 0\text{ A}$, $V_{CE} = 60\text{ V}$		-	0.7	mA
I_{EBO}	Emitter cut-off current	$I_C = 0\text{ A}$, $V_{EB} = 5\text{ V}$		-	1	mA
I_{CES}	Collector cut-off current	$V_{BE} = 0\text{ V}$, $V_{CE} = 100\text{ V}$		-	0.4	mA
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage	$I_B = 0\text{ A}$, $I_C = 30\text{ mA}$	100	-		V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 6\text{ A}$, $I_B = 0.6\text{ A}$		-	1.5	V
$V_{BE(on)}^{(1)}$	Base-emitter on voltage	$I_C = 6\text{ A}$, $V_{CE} = 4\text{ V}$		-	2	V
$h_{FE}^{(1)}$	DC current gain	$I_C = 0.3\text{ A}$, $V_{CE} = 4\text{ V}$	30	-		
		$I_C = 3\text{ A}$, $V_{CE} = 4\text{ V}$	15	-	75	
		Group R	15	-	28	
		Group O	24	-	44	
		Group Y	42	-	75	

1. Pulse test: pulse duration $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

Note: For PNP types voltage and current values are negative.

Note: Product is pre-selected in DC current gain (group R, group O and group Y). STMicroelectronics reserves the right to ship either groups according to production availability. Please contact your nearest STMicroelectronics sales office for delivery details.

2.1 Electrical characteristics (curves)

Figure 1. Typical DC current gain, $V_{CE} = 1\text{ V}$ (NPN)

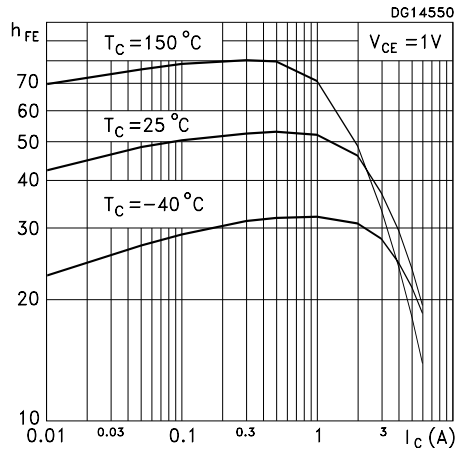


Figure 2. Typical DC current gain, $V_{CE} = -1\text{ V}$ (PNP)

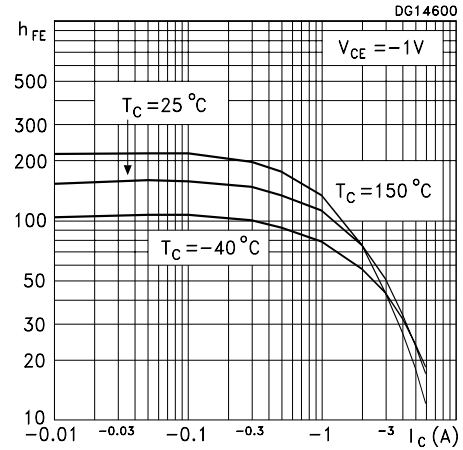


Figure 3. Typical DC current gain, $V_{CE} = 4\text{ V}$ (NPN)

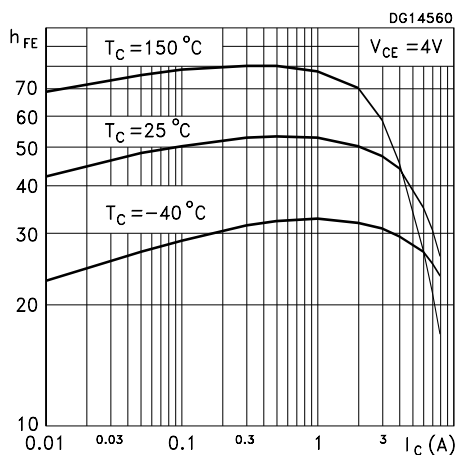


Figure 4. Typical DC current gain, $V_{CE} = -4\text{ V}$ (PNP)

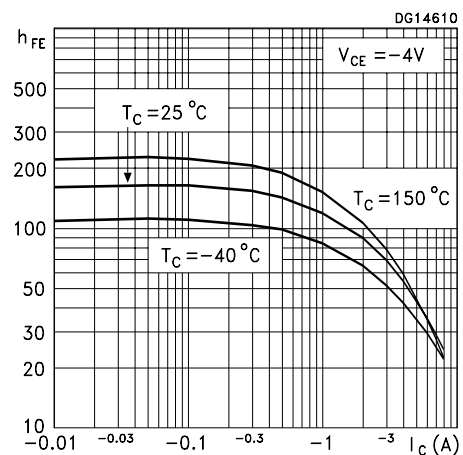


Figure 5. Typical collector-emitter saturation voltage (NPN)

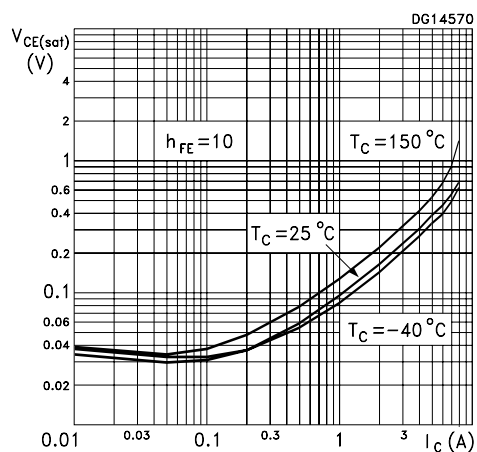


Figure 6. Typical collector-emitter saturation voltage (PNP)

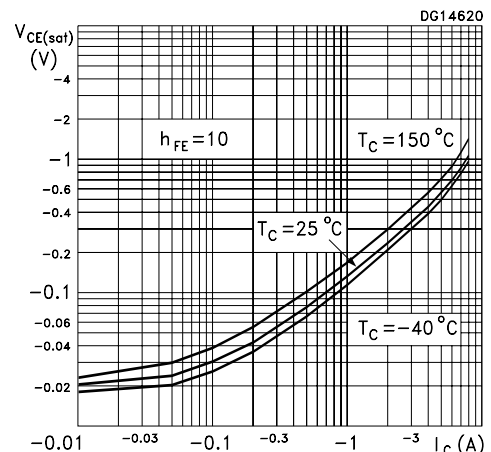


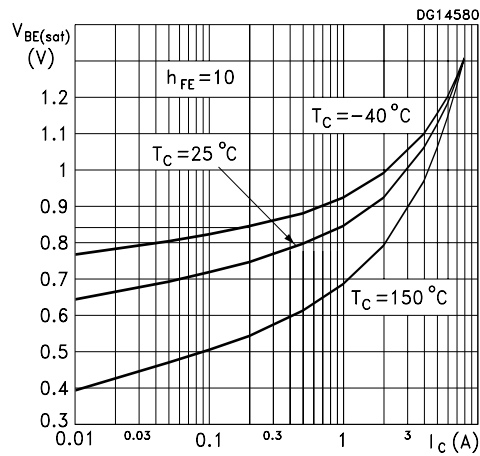
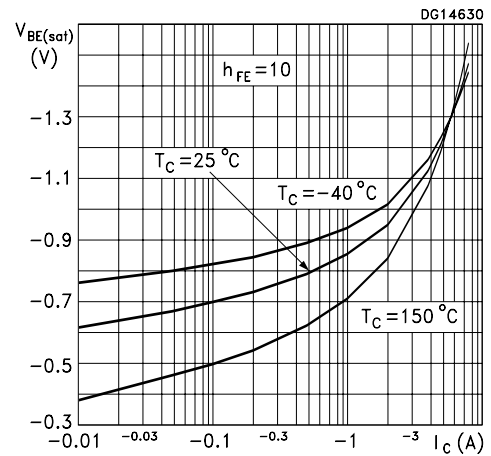
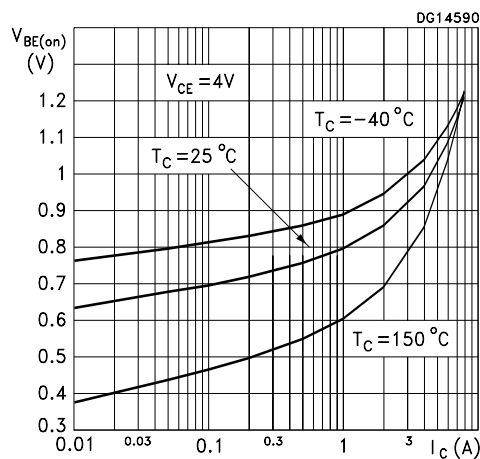
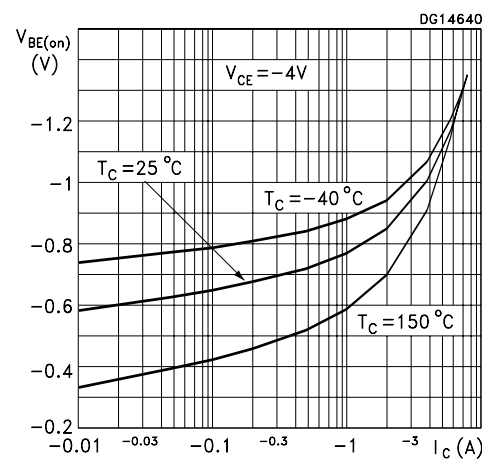
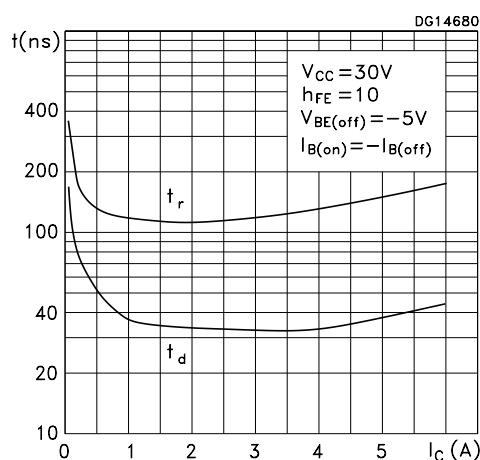
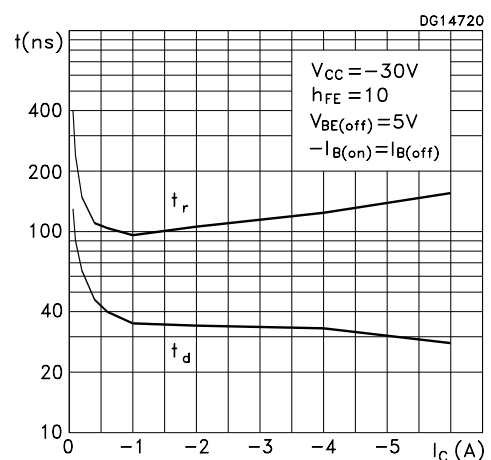
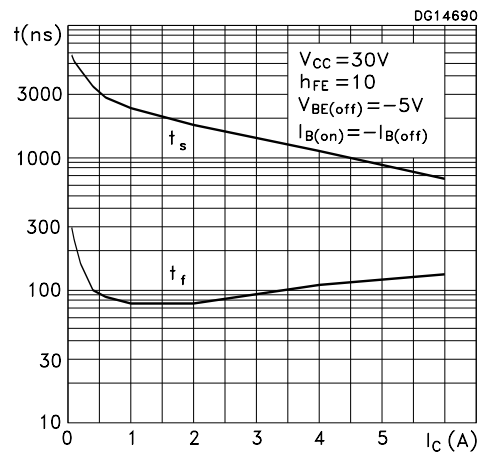
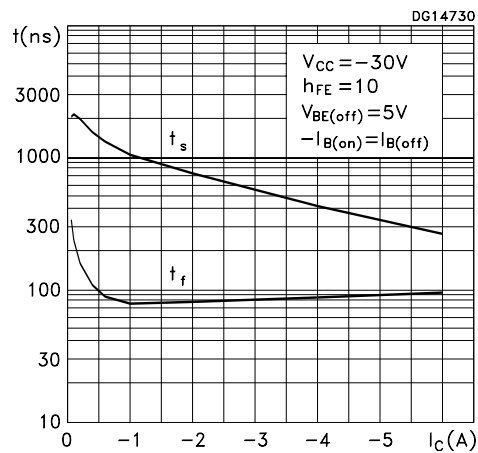
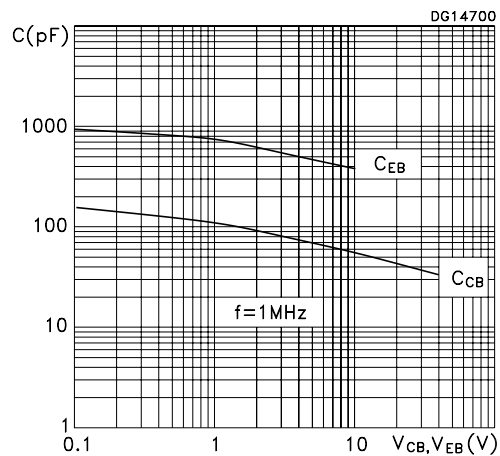
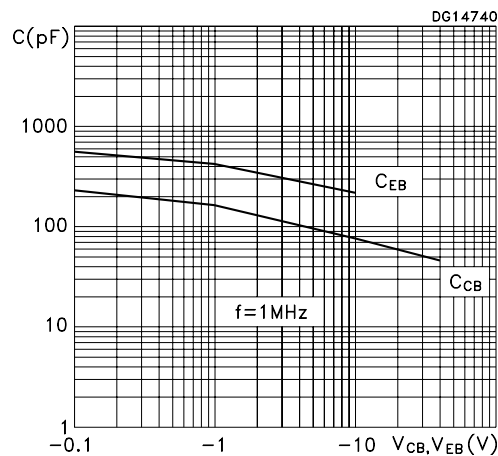
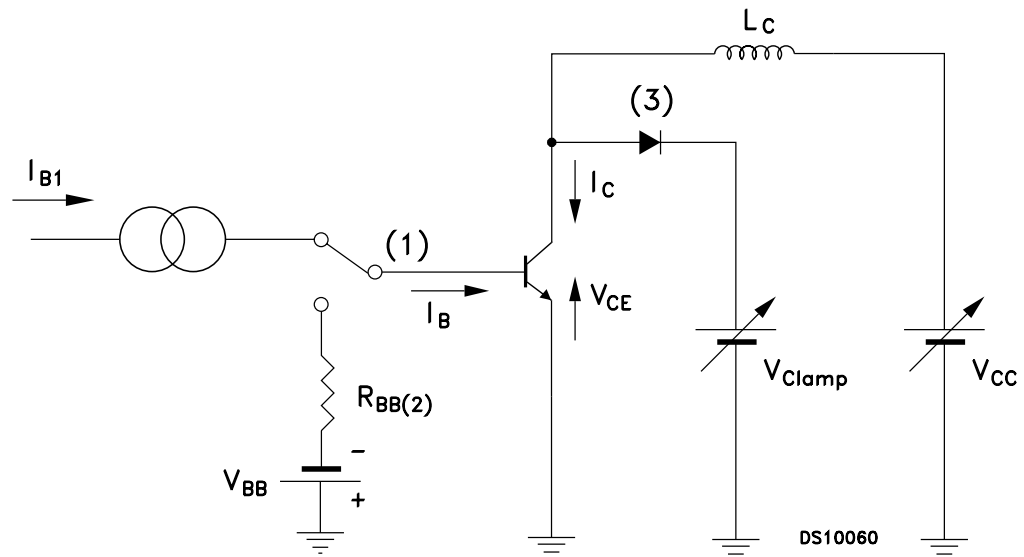
Figure 7. Typical base-emitter saturation voltage (NPN)

Figure 8. Typical base-emitter saturation voltage (PNP)

Figure 9. Typical base-emitter on voltage (NPN)

Figure 10. Typical base-emitter on voltage (PNP)

Figure 11. Typical resistive load switching time (NPN, on)

Figure 12. Typical resistive load switching time (PNP, on)


Figure 13. Typical resistive load switching time (NPN, off)

Figure 14. Typical resistive load switching time (PNP, off)

Figure 15. Typical capacitance characteristics (NPN)

Figure 16. Typical capacitance characteristics (PNP)


3 Test circuits

Figure 17. Inductive load switching test circuit

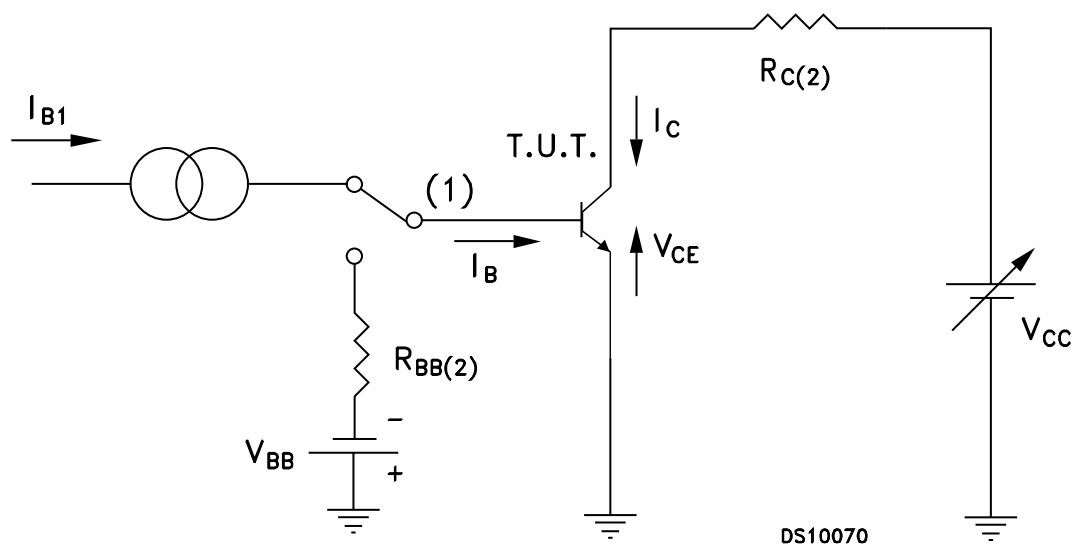


Note: (1) Fast electronic switch.

Note: (2) Non-inductive resistor.

Note: (3) Fast recovery rectifier

Figure 18. Resistive load switching test circuit



Note: (1) Fast electronic switch.

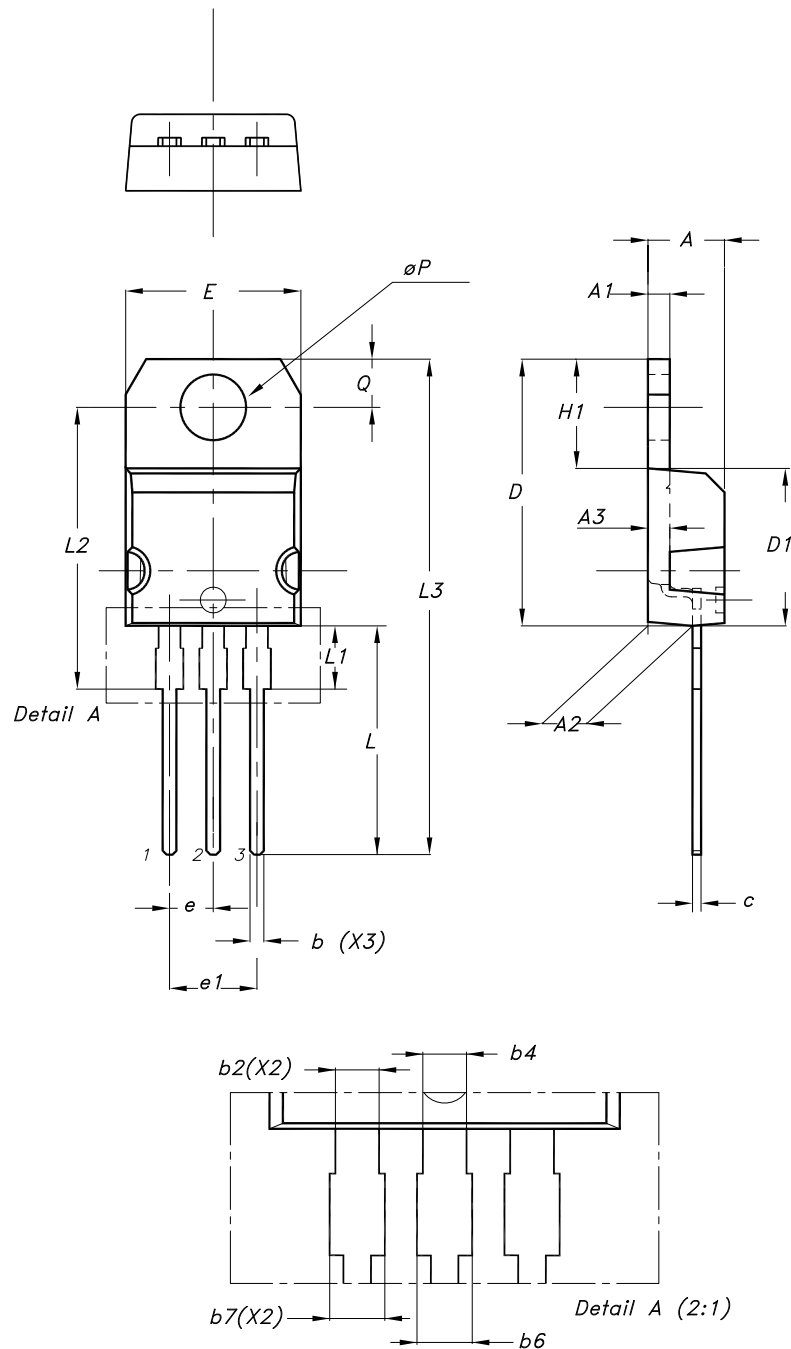
Note: (2) Non-inductive resistor.

4 Package information

To meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions, and product status are available at: www.st.com. ECOPACK is an ST trademark.

4.1 TO-220 type H package information

Figure 19. TO-220 type H package outline



0015988_H_24

Table 4. TO-220 type H package mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	4.40	4.45	4.50
A1	1.22		1.32
A2	2.49	2.59	2.69
A3	1.17	1.27	1.37
b	0.78		0.87
b2	1.25		1.34
b4	1.20		1.29
b6			1.50
b7			1.45
c	0.49		0.56
D	15.40	15.50	15.60
D1	9.05	9.15	9.25
E	10.08	10.18	10.28
e	2.44	2.54	2.64
e1	4.98	5.08	5.18
H1	6.25	6.35	6.45
L	13.20	13.40	13.60
L1	3.50	3.70	3.90
L2	16.30	16.40	16.50
L3	28.70	28.90	29.10
ØP	3.75	3.80	3.85
Q	2.70	2.80	2.90
Slug flatness		0.03	0.10

5 Ordering information

Table 5. Order codes

Order codes	Marking ⁽¹⁾	Package	Packing
TIP41C	TIP41C R	TO-220	Tube
	TIP41C O		
	TIP41C Y		
TIP42C	TIP42C R		
	TIP42C O		
	TIP42C Y		

1. See [Table 3. Electrical characteristics](#)