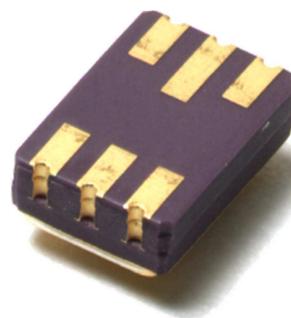


COMPLEMENTARY SILICON PLANAR EPITAXIAL NPN/PNP TRANSISTOR

ZTX653/ZTX753DCSM

- Complimentary Silicon Planar NPN/PNP Transistors
- Hermetic Ceramic Surface Mounted Package.
- Hi-Rel Screening Options Available



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

		ZTX653	ZTX753
V_{CBO}	Collector – Base Voltage	120V	-120V
V_{CEO}	Collector – Emitter Voltage	100V	-100V
V_{EBO}	Emitter – Base Voltage	5V	-5V
I_C	Continuous Collector Current	2A	-2A
I_B	Base Current	2A	-2A
P_D	Total Power Dissipation at $T_A = 25^\circ\text{C}$ Derate Above 25°C	1.0W 8mW/ $^\circ\text{C}$	
T_J	Junction Temperature Range	-55 to $+150^\circ\text{C}$	
T_{stg}	Storage Temperature Range	-55 to $+150^\circ\text{C}$	

THERMAL PROPERTIES (Each Device)

Symbols	Parameters	Max.	Units
$R_{\theta JA}$	Thermal Resistance, Junction To Ambient	125	$^\circ\text{C/W}$

Semelab Limited reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

SILICON PLANAR EPITAXIAL NPN/PNP TRANSISTORS ZTX653/ZTX753DCSM

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min.	Typ.	Max.	Units
$V_{(BR)CBO}^{(1)}$	Collector-Base Breakdown Voltage	$I_C = 100\mu\text{A}$ ZTX653	120			V
		$I_C = -100\mu\text{A}$ ZTX753	-120			
$V_{(BR)CEO}^{(1)}$	Collector-Emitter Breakdown Voltage	$I_C = 10\text{mA}$ ZTX653	100			
		$I_C = -10\text{mA}$ ZTX753	-100			
$V_{(BR)EBO}^{(1)}$	Emitter-Base Breakdown Voltage	$I_E = 100\mu\text{A}$ ZTX653	5			
		$I_E = -100\mu\text{A}$ ZTX753	-5			
$I_{CBO}^{(1)}$	Collector-Base Cut-off Current	$V_{CB} = 100\text{V}$ ZTX653			0.1	μA
		$T_C = 100^\circ\text{C}$			10	
		$V_{CB} = -100\text{V}$ ZTX753			-0.1	
		$T_C = 100^\circ\text{C}$			-10	
$I_{EBO}^{(1)}$	Emitter-Base Cut-off Current	$V_{EB} = 4\text{V}$ ZTX653			0.1	
		$V_{EB} = -4\text{V}$ ZTX753			-0.1	
$V_{CE(sat)}^{(1)}$	Collector-Emitter Saturation Voltage	$I_C = 500\text{mA}$ ZTX653		0.2	0.3	V
		$I_B = 50\text{mA}$				
		$I_C = -500\text{mA}$ ZTX753		-0.2	-0.3	
		$I_B = -50\text{mA}$				
		$I_C = 1.0\text{A}$ ZTX653		0.35	0.5	
		$I_B = 100\text{mA}$				
$V_{BE(sat)}^{(1)}$	Base-Emitter Saturation Voltage	$I_C = -1.0\text{A}$ ZTX753		-0.35	-0.5	
		$I_B = -100\text{mA}$				
$V_{BE(on)}^{(1)}$	Base-Emitter Turn-On Voltage	$I_C = 2\text{A}$ ZTX653		0.8	1.0	
		$I_B = 200\text{mA}$				
$V_{BE(sat)}^{(1)}$	Base-Emitter Saturation Voltage	$I_C = -2\text{A}$ ZTX753		-0.8	-1.0	
		$I_B = -200\text{mA}$				
$V_{BE(sat)}^{(1)}$	Base-Emitter Saturation Voltage	$I_C = 1.0\text{A}$ ZTX653		1.0	1.3	
		$I_B = 100\text{mA}$				
$V_{BE(sat)}^{(1)}$	Base-Emitter Saturation Voltage	$I_C = -1.0\text{A}$ ZTX753		-1.0	-1.3	
		$I_B = -100\text{mA}$				
$V_{BE(on)}^{(1)}$	Base-Emitter Turn-On Voltage	$I_C = 1.0\text{A}$ ZTX653		0.95	1.2	
		$V_{CE} = 2\text{V}$				
$V_{BE(on)}^{(1)}$	Base-Emitter Turn-On Voltage	$I_C = 1.0\text{A}$ ZTX753		-0.95	-1.2	
		$V_{CE} = 2\text{V}$				

Table continued on the next page

SILICON PLANAR EPITAXIAL NPN/PNP TRANSISTORS ZTX653/ZTX753DCSM

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise stated) Continued

Symbols	Parameters	Test Conditions	Min.	Typ.	Max.	Units
$h_{FE}^{(1)}$	DC Current Gain	$I_C = 50\text{mA}$ $V_{CE} = 2\text{V}$ ZTX653	70	200		-
		$I_C = -50\text{mA}$ $V_{CE} = -2\text{V}$ ZTX753				
		$I_C = 500\text{mA}$ $V_{CE} = 2\text{V}$ ZTX653	100	200	300	
		$I_C = -500\text{mA}$ $V_{CE} = -2\text{V}$ ZTX753				
		$I_C = 1.0\text{A}$ $V_{CE} = 2\text{V}$ ZTX653	55	110		
		$I_C = -1.0\text{A}$ $V_{CE} = -2\text{V}$ ZTX753				
		$I_C = 2\text{A}$ $V_{CE} = 2\text{V}$ ZTX653	25	55		
		$I_C = -2\text{A}$ $V_{CE} = -2\text{V}$ ZTX753				

DYNAMIC CHARACTERISTICS

Symbols	Parameters	Test Conditions		Min.	Typ	Max.	Units
f _T	Transition Frequency	I _C = 100mA f =100MHz	V _{CE} = 5V ZTX653	140	175		MHz
		I _C = -100mA f =100MHz	V _{CE} = -5V ZTX753	100	140		
C _{obo}	Output Capacitance	I _E = 0 f =1.0MHz	V _{CB} = 10V ZTX653			30	pF
		I _E = 0 f =1.0MHz	V _{CB} = -10V ZTX753				
T _{on}	Turn-On Time	I _C = 500mA	ZTX653		80		ns
		V _{CC} = 10V					
		I _C = -500mA	ZTX753		40		
		V _{CC} = -10V					
T _{off}	Turn-Off Time	I _{B1} = I _{B2} = 50mA	ZTX653		1200		
		I _{B1} = I _{B2} = -50mA	ZTX753		600		

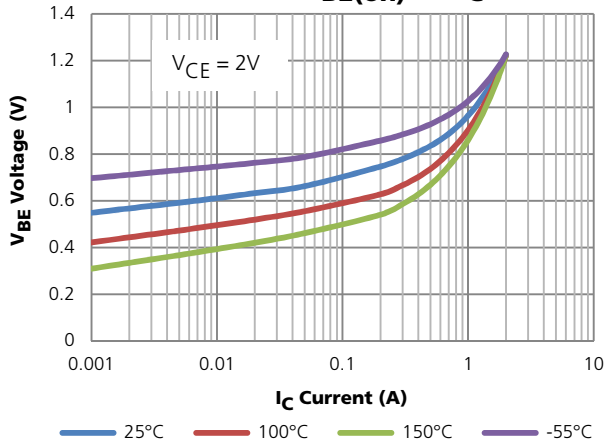
Notes

(1) Pulse Width $\leq 380\mu\text{s}$, $\delta \leq 2\%$

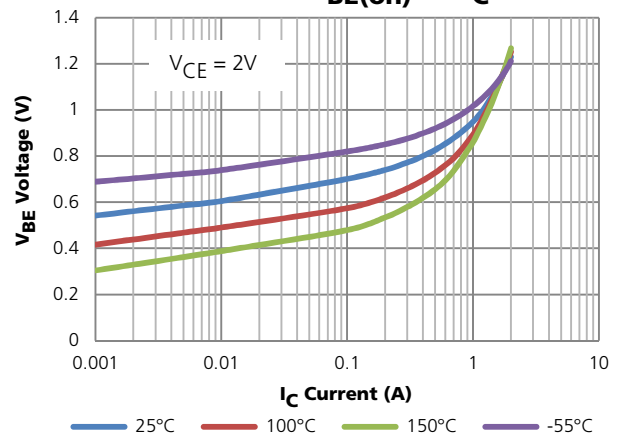
SILICON PLANAR EPITAXIAL NPN/PNP TRANSISTORS ZTX653/ZTX753DCSM

TYPICAL DEVICE CHARACTERISTICS

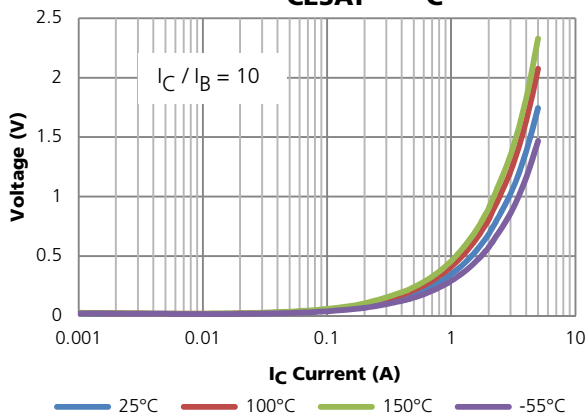
ZTX653 $V_{BE(on)}$ vs I_C



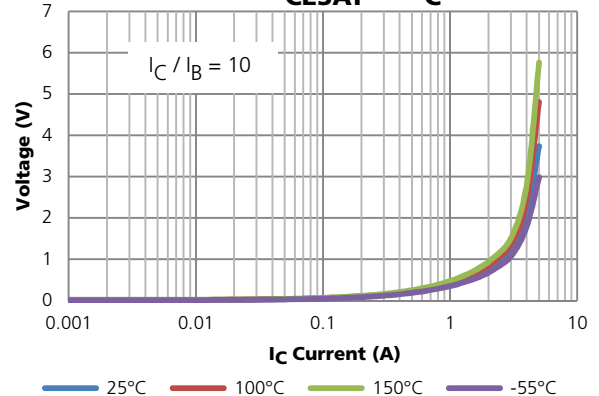
ZTX753 $V_{BE(on)}$ vs I_C



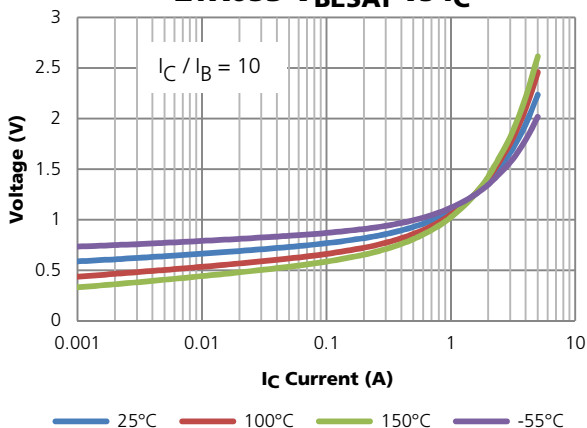
ZTX653 V_{CESAT} vs I_C



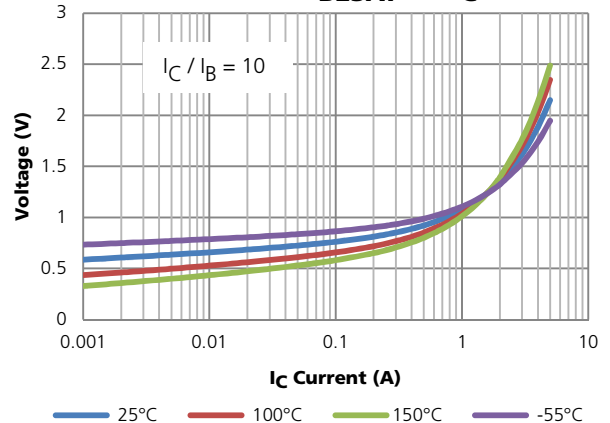
ZTX753 V_{CESAT} vs I_C



ZTX653 V_{BESAT} vs I_C



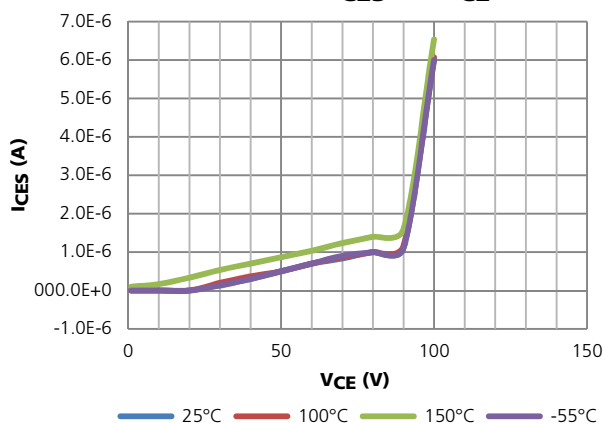
ZTX753 V_{BESAT} vs I_C



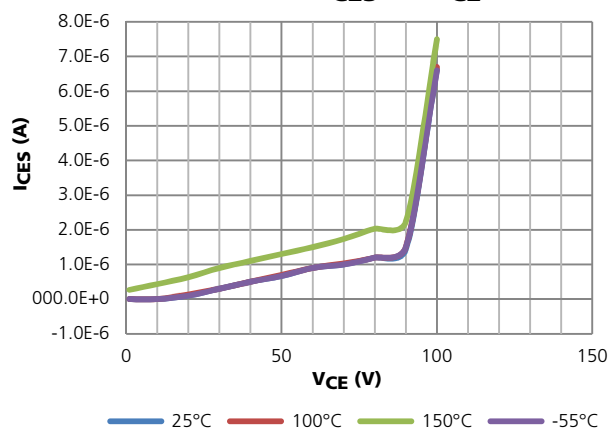
SILICON PLANAR EPITAXIAL NPN/PNP TRANSISTORS ZTX653/ZTX753DCSM

TYPICAL DEVICE CHARACTERISTICS (Continued)

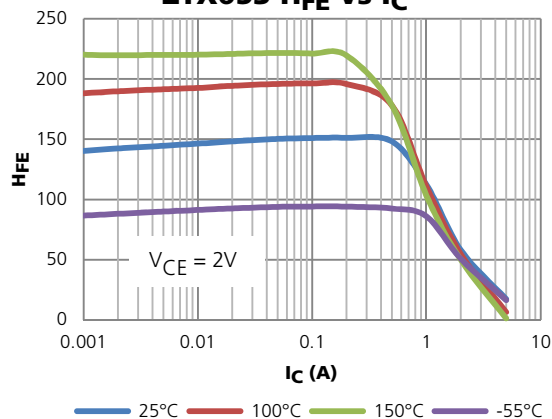
ZTX653 I_{CES} vs V_{CE}



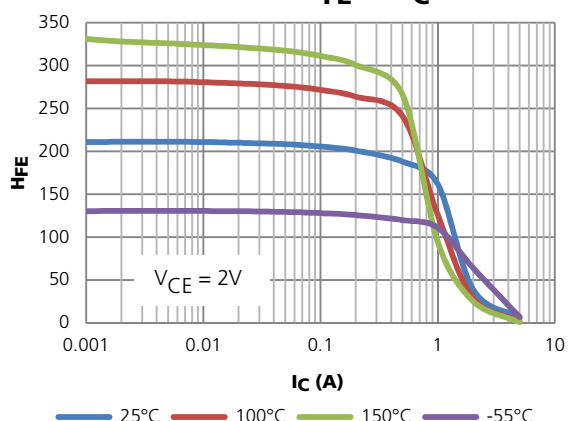
ZTX753 I_{CES} vs V_{CE}



ZTX653 H_{FE} vs I_C

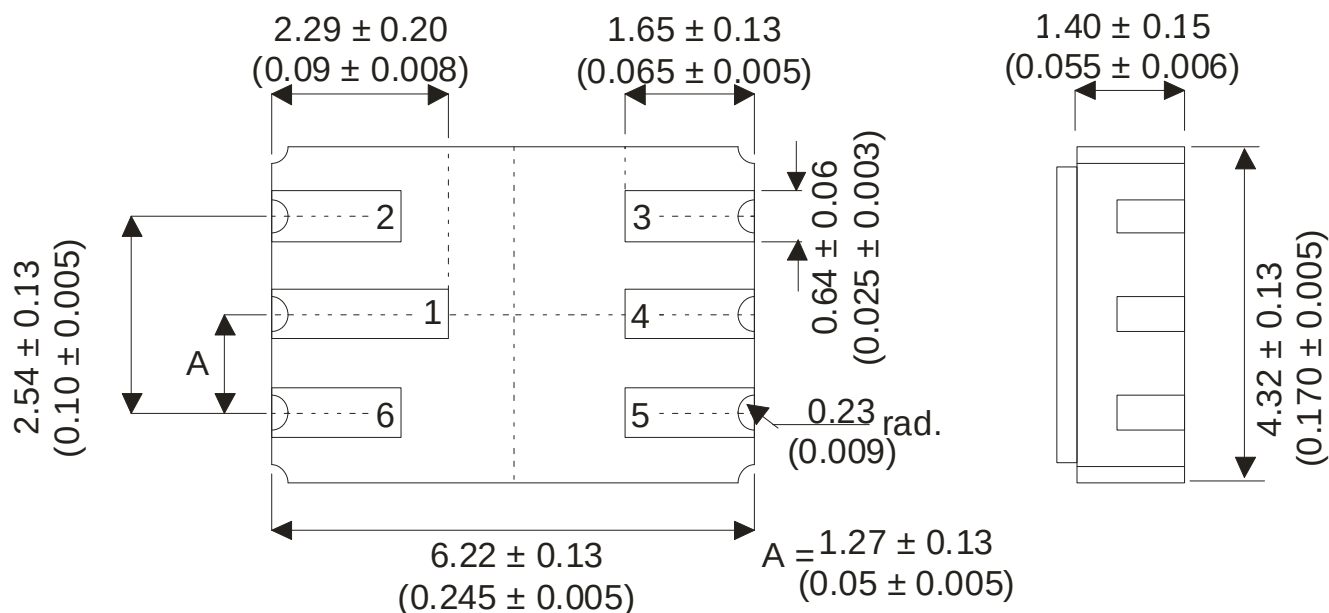


ZTX753 H_{FE} vs I_C



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Dimensions in mm (inches)



Underside View

Pad 6 – Emitter 1