70V NPN LOW SATURATION TRANSISTOR IN SOT-666

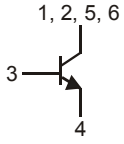
Features

- BV_{CEO} = 70V
- I_C = 2.0A Continuous Current
- I_{CM}= 5A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < 30mV @ 100mA
- R_{sat} = 130mΩ for a Low Equivalent On-Resistance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen- and Antimony-Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

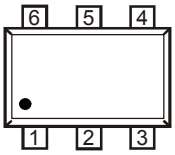
Mechanical Data

- Case: SOT666
- Case Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.004 grams (Approximate)

Top View



Device Schematic



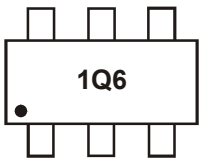
Pin Out Configuration

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXTN26070CV-7	Standard	1Q6	7	8mm	3000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



1Q6 = Product Type Marking Code

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

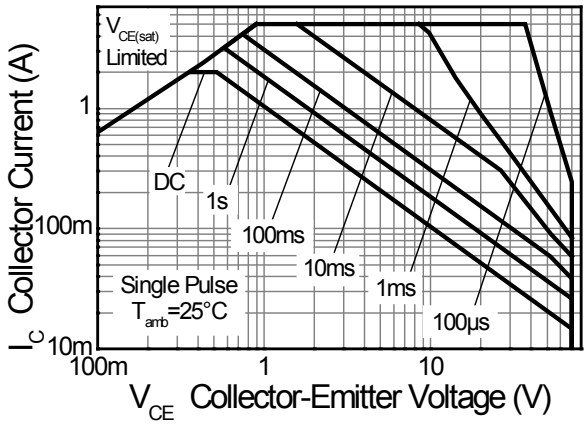
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage	V_{CEO}	70	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	2	A
Peak Pulse Collector Current (single pulse)	I_{CM}	5	A
Base Current	I_B	500	mA

Thermal Characteristics (@ T_A = +25°C unless otherwise specified.)

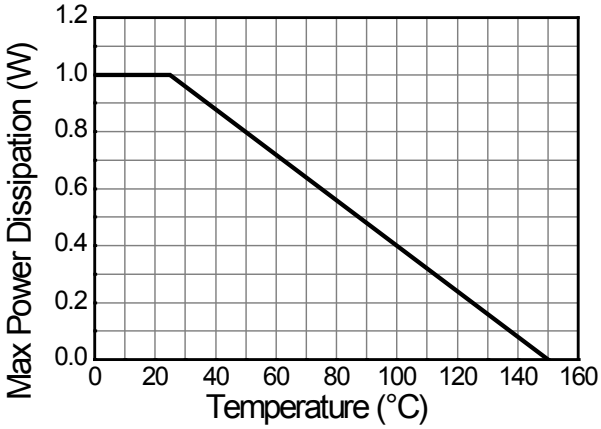
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	0.6	W
Total Power Dissipation (Note 6)	P_D	1	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	208	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	121	°C/W
Thermal Resistance, Junction to Lead (Note 7)	$R_{\theta JL}$	37	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 5. For a device surface mounted minimum recommended pad layout, in still air conditions
6. Mounted on 25mm X 25mm X 1.6mm FR4 PCB with high coverage of single sided 2 oz copper, in still air conditions.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).

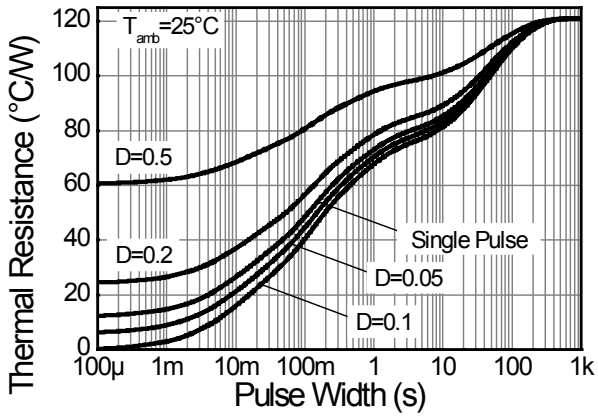
Thermal Characteristics and Derating Information



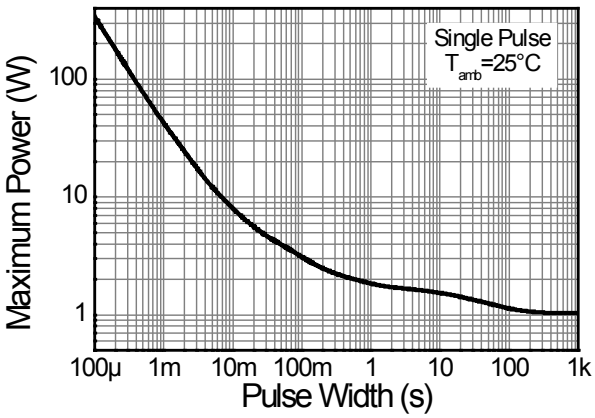
Safe Operating Area



Derating Curve



Transient Thermal Impedance



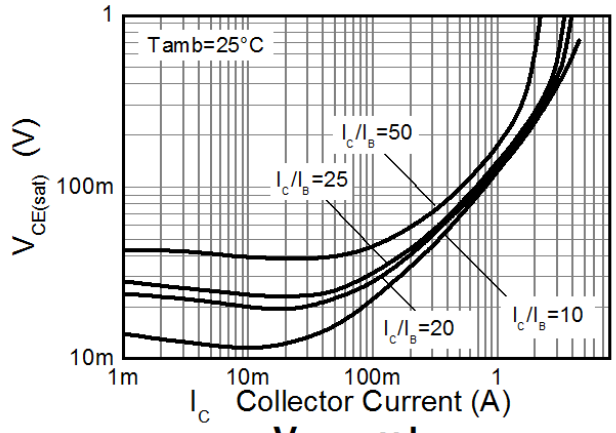
Pulse Power Dissipation

Electrical Characteristics @ T_A = 25°C unless otherwise specified

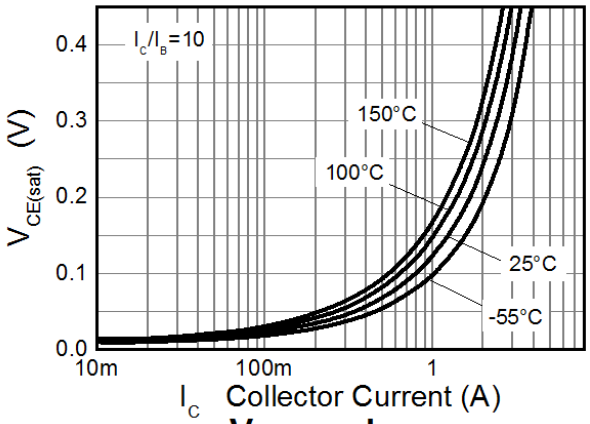
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	150	190	–	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	70	80	–	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.3	–	V	I_E = 100µA
Collector-Base Cut Off Current	I_{CBO}	–	–	100	nA	V_{CB} = 60V , V_{CES} = 60V
Collector-Emitter Cut Off Current	I_{CES}	–	–	100	nA	V_{CB} = 60V , V_{CES} = 60V
Emitter Cut Off Current	I_{EBO}	–	–	100	nA	V_{EB} = 5.6V
ON CHARACTERISTICS (Note 8)						
DC Current Gain	h_{FE}	190 200 75	320 340 110	– – –	–	I_C = 10mA, V_{CE} = 5V I_C = 100mA, V_{CE} = 5V I_C = 2A, V_{CE} = 5V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	– – – – –	22 110 147 135 265	30 150 200 165 330	mV	I_C = 0.1A, I_B = 10mA I_C = 0.5A, I_B = 10mA I_C = 1A, I_B = 50mA I_C = 1A, I_B = 100mA I_C = 2A, I_B = 200mA
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	–	0.85	1.0	V	I_C = 1A, V_{CE} = 2V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	–	0.90	1.1	V	I_C = 1A, I_B = 50mA
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	–	10	–	pF	V_{CB} = 10V. f = 1MHz
Transition frequency	f_T	–	200	–	MHz	V_{CE} = 10V, I_C = 50mA, f = 100MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	–	46	–	ns	V_{CE} = 10V, I_C = 0.5A
Turn-Off Time	t_{off}	–	722	–	ns	I_{B1} = -I_{B2} = 25mA

Note: 8. Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤ 2%

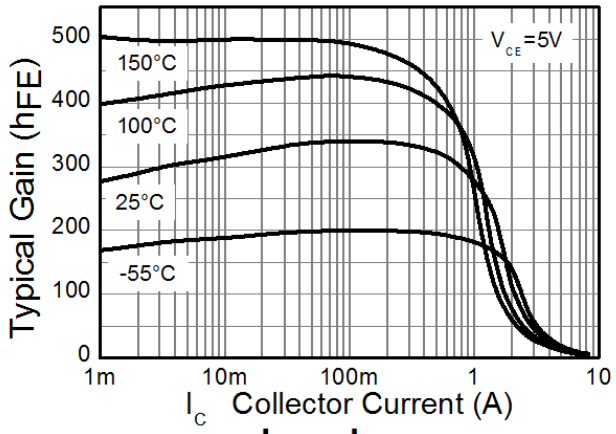
Typical Characteristics



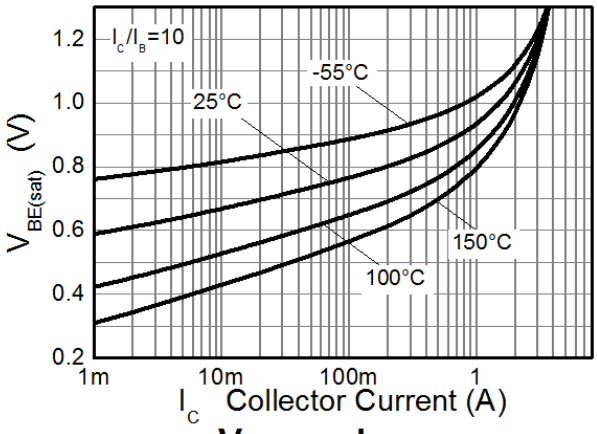
$V_{CE(sat)}$ v I_C



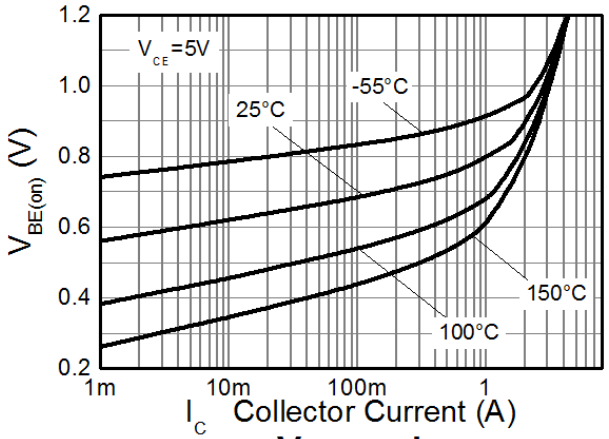
$V_{CE(sat)}$ v I_C



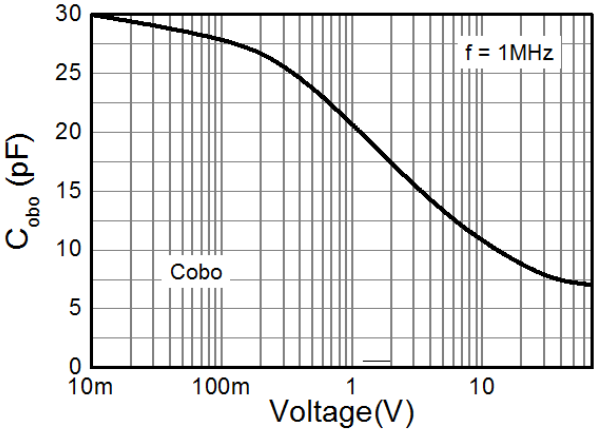
h_{FE} v I_C



$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

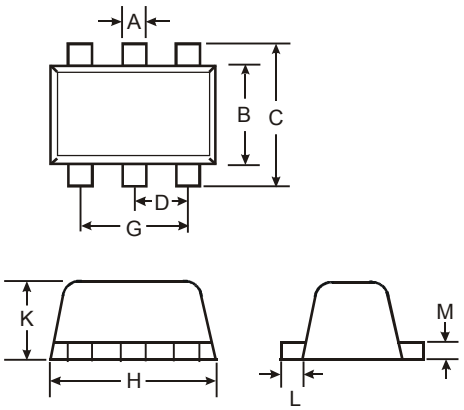


C_{obo} v V

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT666

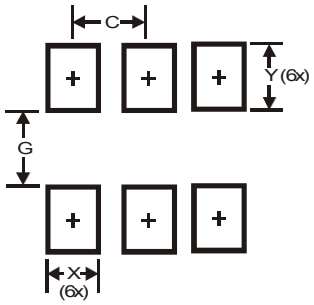


SOT666			
Dim	**Min**	**Max**	**Typ**
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	0.50	-
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.15
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT666



Dimensions	Value (in mm)
C	0.50
G	0.80
X	0.35
Y	0.50

Note: The suggested land pattern dimensions have been provided for reference only, as actual pad layouts may vary depending on application. These dimensions may be modified based on user equipment capability or fabrication criteria. A more robust pattern may be desired for wave soldering and is calculated by adding 0.2 mm to the 'Z' dimension. For further information, please reference document IPC-7351A, Naming Convention for Standard SMT Land Patterns, and for International grid details, please see document IEC, Publication 97.

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

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