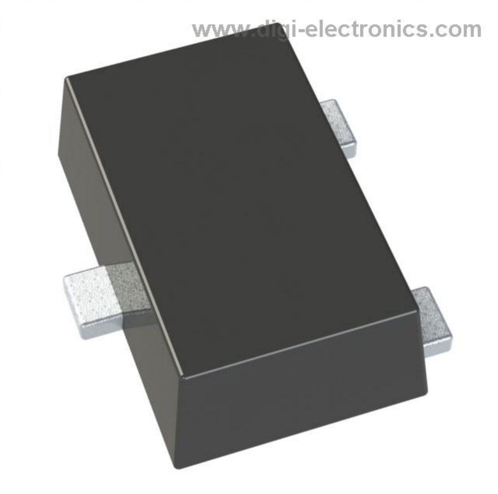
# ZXTP07040DFFTA Datasheet



https://www.DiGi-Electronics.com

| | |
|---|---|
| DiGi Electronics Part Number | ZXTP07040DFFTA-DG |
| Manufacturer | Diodes Incorporated |
| Manufacturer Product Number | ZXTP07040DFFTA |
| Description | TRANS PNP 40V 3A SOT23F |
| Detailed Description | Bipolar (BJT) Transistor PNP 40 V 3 A 200MHz 1.5 W Surface Mount SOT-23F |

## Purchase and inquiry

| | | | |
|---|---|---|---|
| Manufacturer Product Number: | ZXTP07040DFFTA | Manufacturer: | Diodes Incorporated |
| Series: | - | Product Status: | Active |
| Transistor Type: | PNP | Current - Collector (Ic) (Max): | 3 A |
| Voltage - Collector Emitter Breakdown (Max): | 40 V | Vce Saturation (Max) @ Ib, Ic: | 390mV @ 150mA, 3A |
| Current - Collector Cutoff (Max): | 50nA (ICBO) | DC Current Gain (hFE) (Min) @ Ic, Vce: | 300 @ 10mA, 2V |
| Power - Max: | 1.5 W | Frequency - Transition: | 200MHz |
| Operating Temperature: | -55°C ~ 150°C (TJ) | Mounting Type: | Surface Mount |
| Package / Case: | SOT-23-3 Flat Leads | Supplier Device Package: | SOT-23F |
| Base Product Number: | ZXTP07040 | | |

## Environmental & Export classification

| | | | |
|---|---|---|---|
| RoHS Status: | ROHS3 Compliant | Moisture Sensitivity Level (MSL): | 1 (Unlimited) |
| REACH Status: | REACH Unaffected | ECCN: | EAR99 |
| HTSUS: | 8541.29.0075 | | |

**ZXTP07040DFF**

# 40V PNP LOW SATURATION TRANSISTOR IN SOT23F

## Features

- $BV_{CEO} > -40V$
- $BV_{ECO} > -3V$
- $I_C = -3A$ Continuous Collector Current
- Low Saturation Voltage $V_{CE(SAT)} < -100mV$ @ -1A
- $R_{CE(SAT)} = 67m\Omega$
- High $h_{FE}$ Min 200 @ -1A
- 1.5W Power Dissipation
- Complementary NPN Type: ZXTN07045EFF
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Description

This low voltage PNP transistor has been designed for applications requiring high gain and very low saturation voltage. The SOT23F package is pin compatible with the industry standard SOT23 footprint but offers lower profile and higher dissipation for applications where power density is of utmost importance.

## Mechanical Data

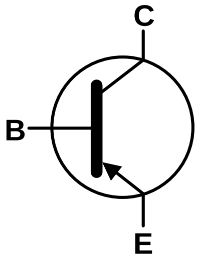
- Case: SOT23F
- Case Material: Molded Plastic. “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.012 grams (Approximate)

## Applications

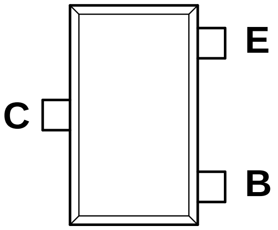
- Load Switches
- Battery Charging
- Siren Driver
- MOSFET and IGBT Gate Driver
- Motor Drive

SOT23F

Top View



Device Symbol



Top View
Pin Configuration

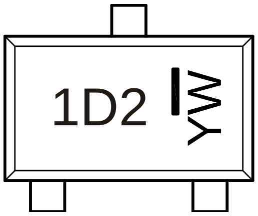
## Ordering Information (Note 4)

| Product | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|---|---|---|---|---|---|
| ZXTP07040DFFTA | AEC-Q101 | 1D2 | 7 | 8 | 3,000 |

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html 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 http://www.diodes.com/products/packages.html.

## Marking Information

**SOT23F**



1D2 = Product Type Marking Code
YW = Date Code Marking
Y = Year : 0~9
W = Week : A~Z : 1~26
a~z : 27~52
z represents 52 & 53 week

## Absolute Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | -50 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | -40 | V |
| Emitter-Collector Voltage (Reverse Blocking) | $V_{ECO}$ | -3 | V |
| Emitter-Base Voltage | $V_{EBO}$ | -7 | V |
| Continuous Collector Current | $I_C$ | -3 | A |
| Peak Pulse Current | $I_{CM}$ | -6 | A |
| Base Current | $I_B$ | -1 | A |

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

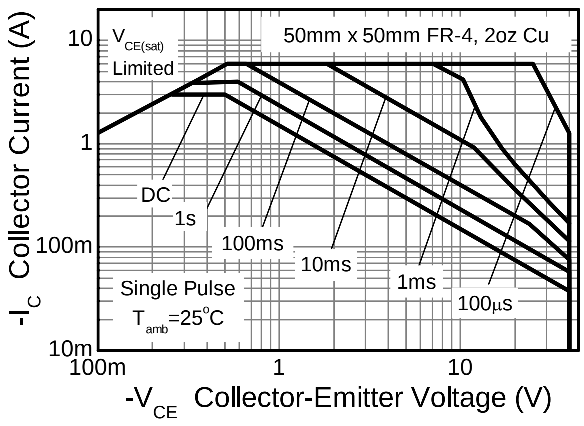
| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Power Dissipation<br>Linear Derating Factor | (Note 5) | $P_D$ | 0.84<br>6.72 | W<br>mW/°C |
| | (Note 6) | | 1.34<br>10.72 | |
| | (Note 7) | | 1.50<br>12.0 | |
| | (Note 8) | | 2.0<br>16.0 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | $R_{\theta JA}$ | 149 | °C/W |
| | (Note 6) | | 93 | |
| | (Note 7) | | 83 | |
| | (Note 8) | | 60 | |
| Thermal Resistance, Junction to Lead | (Note 9) | $R_{\theta JL}$ | 43.8 | °C/W |
| Operating and Storage Temperature Range | | $T_{J,}$ $T_{STG}$ | -55 to +150 | °C |

## ESD Ratings (Note 10)

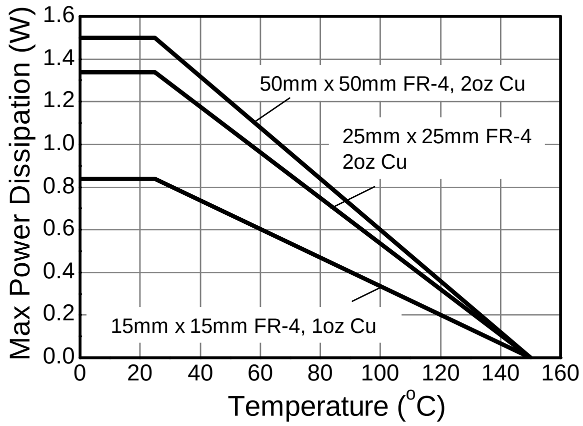
| Characteristic | Symbol | Value | Unit | JEDEC Class |
|---|---|---|---|---|
| Electrostatic Discharge – Human Body Model | ESD HBM | 4,000 | V | 3A |
| Electrostatic Discharge – Machine Model | ESD MM | 400 | V | C |

Notes:
5. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
7. Same as Note 5, except the device is mounted on 50mm x 50mm 2oz copper.
8. Same as Note 7, whilst measured at t < 5 seconds.
9. Thermal resistance from junction to solder-point (at the end of the collector lead).
10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

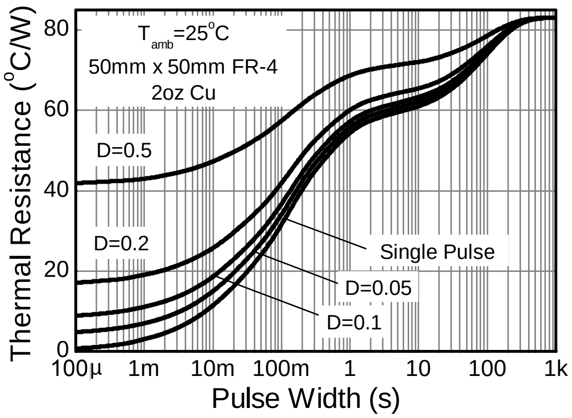
## Thermal Characteristics and Derating Information



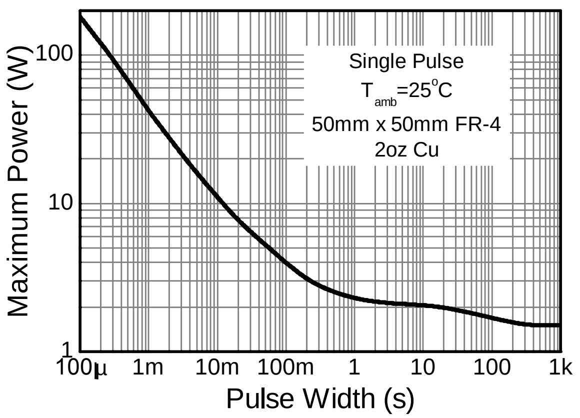
**Safe Operating Area**



**Derating Curve**



**Transient Thermal Impedance**



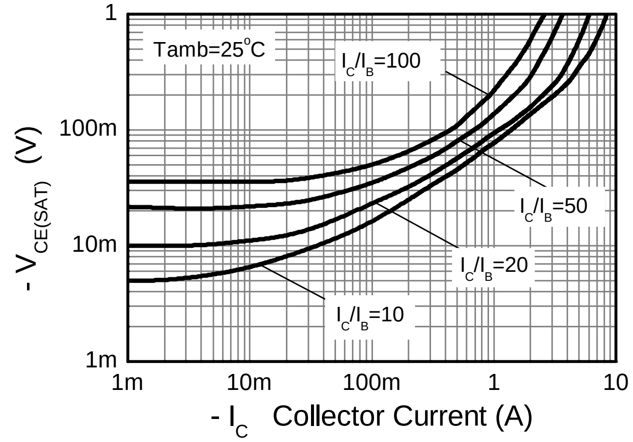
**Pulse Power Dissipation**

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

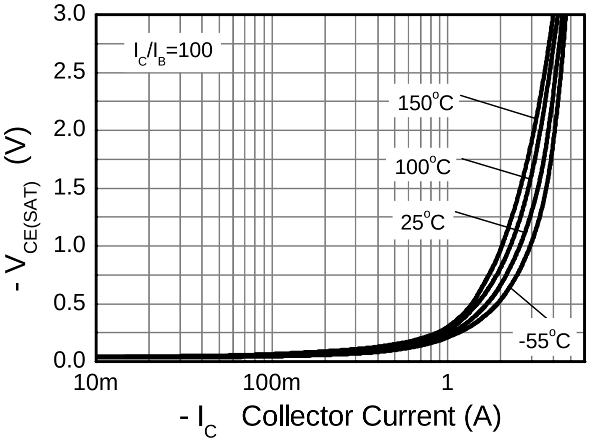
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Collector-Base Breakdown Voltage | $BV_{CBO}$ | -50 | -80 | — | V | $I_C = -100\mu A$ |
| Collector-Emitter Breakdown Voltage (Base Open) (Note 11) | $BV_{CEO}$ | -40 | -65 | — | V | $I_C = -10mA$ |
| Emitter-Collector Breakdown Voltage (Reverse Blocking) | $BV_{ECO}$ | -3 | -8.6 | — | V | $I_E = -100\mu A$ |
| Emitter-Base Breakdown Voltage | $BV_{EBO}$ | -7 | -8.3 | — | V | $I_E = -100\mu A$ |
| Collector-Base Cutoff Current | $I_{CBO}$ | — | <-1<br>— | -50<br>-20 | nA<br>µA | $V_{CB} = -36V$<br>$V_{CB} = -36V$, $T_A = +100°C$ |
| Emitter-Base Cutoff Current | $I_{EBO}$ | — | <-1 | -50 | nA | $V_{EB} = -5.6V$ |
| **ON CHARACTERISTICS** (Note 11) | | | | | | |
| Static Forward Current Transfer Ratio | $h_{FE}$ | 300<br>250<br>200<br>80 | 450<br>380<br>330<br>160 | 800<br>—<br>—<br>— | — | $I_C = -10mA$, $V_{CE} = -2V$<br>$I_C = -0.5A$, $V_{CE} = -2V$<br>$I_C = -1A$, $V_{CE} = -2V$<br>$I_C = -3A$, $V_{CE} = -2V$ |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | — | -110<br>-80<br>-230<br>-310<br>-250 | -180<br>-100<br>-400<br>-540<br>-390 | mV | $I_C = -0.5A$, $I_B = -5mA$<br>$I_C = -1A$, $I_B = -100mA$<br>$I_C = -1A$, $I_B = -10mA$<br>$I_C = -2A$, $I_B = -40mA$<br>$I_C = -3A$, $I_B = -150mA$ |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | — | -935 | -1040 | mV | $I_C = -3A$, $I_B = -150mA$ |
| Base-Emitter On Voltage | $V_{BE(ON)}$ | — | -825 | -930 | mV | $I_C = -3A$, $V_{CE} = -2V$ |
| **SMALL SIGNAL CHARACTERISTICS** | | | | | | |
| Transition Frequency | $f_T$ | 100 | 200 | — | MHz | $I_C = -50mA$, $V_{CE} = -5V$, f = 50MHz |
| Output Capacitance | $C_{OBO}$ | — | 30 | 40 | pF | $V_{CB} = -10V$, f = 1MHz |
| Delay Time | $t_D$ | — | 20.7 | — | ns | $V_{CC} = -10V$,<br>$I_C = -500mA$,<br>$I_{B1} = I_{B2} = -50mA$ |
| Rise Time | $t_R$ | — | 12.2 | — | ns | |
| Storage Time | $t_S$ | — | 375 | — | ns | |
| Fall Time | $t_F$ | — | 72 | — | ns | |

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

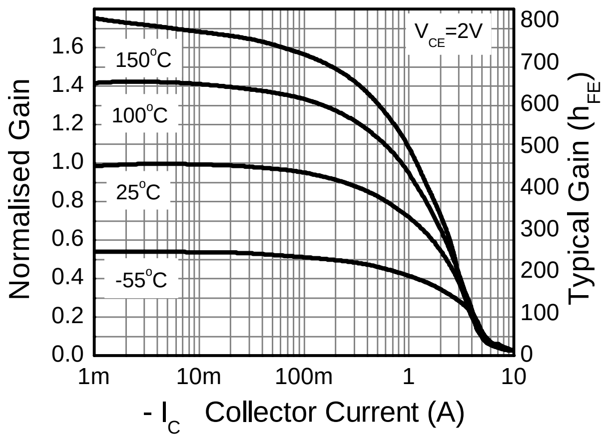
## Typical Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)



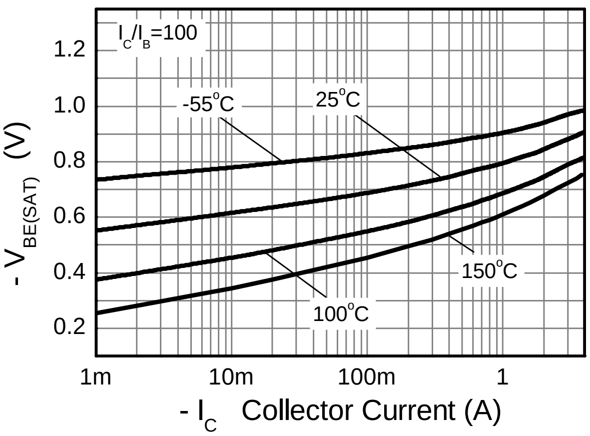
**$V_{CE(SAT)}$ v $I_C$**



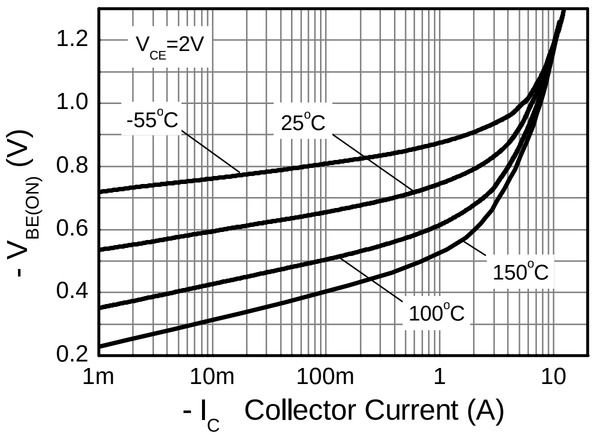
**$V_{CE(SAT)}$ v $I_C$**



**$h_{FE}$ v $I_C$**



**$V_{BE(SAT)}$ v $I_C$**

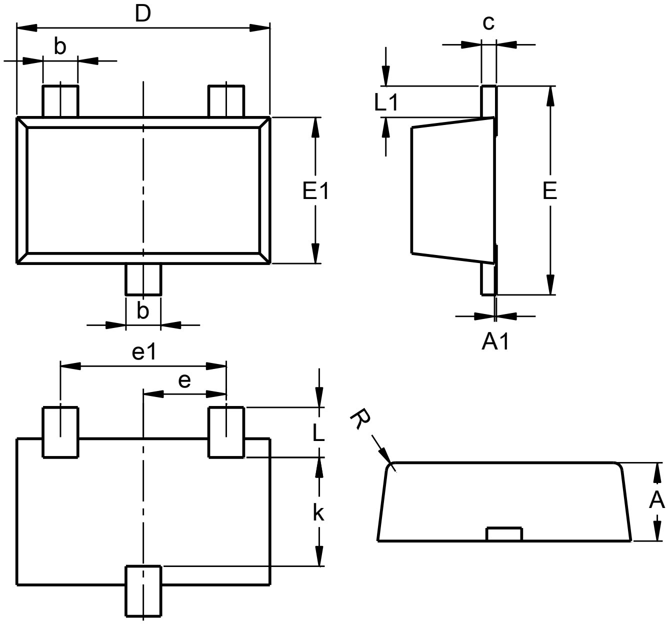


**$V_{BE(ON)}$ v $I_C$**

## Package Outline Dimensions

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

**SOT23F**

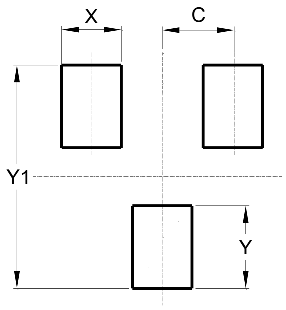


| SOT23F | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.80 | 1.00 | 0.90 |
| **A1** | 0.00 | 0.10 | 0.01 |
| **b** | 0.35 | 0.50 | 0.44 |
| **c** | 0.10 | 0.20 | 0.16 |
| **D** | 2.80 | 3.00 | 2.90 |
| **e** | 0.95 REF | | |
| **e1** | 1.90 REF | | |
| **E** | 2.30 | 2.50 | 2.40 |
| **E1** | 1.50 | 1.70 | 1.65 |
| **k** | 1.20 | - | - |
| **L** | 0.30 | 0.65 | 0.50 |
| **L1** | 0.30 | 0.50 | 0.40 |
| **R** | 0.05 | 0.15 | - |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

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

**SOT23F**



| Dimensions | Value (in mm) |
|---|---|
| **C** | 0.95 |
| **X** | 0.80 |
| **Y** | 1.110 |
| **Y1** | 3.000 |

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