

TIP140 TIP141 TIP142 NPN  
TIP145 TIP146 TIP147 PNP

**COMPLEMENTARY  
SILICON  
POWER DARLINGTON TRANSISTORS**



**TO-218 TRANSISTOR CASE**



[www.centrasemi.com](http://www.centrasemi.com)

**DESCRIPTION:**

The CENTRAL SEMICONDUCTOR TIP140 and TIP145 series devices are complementary silicon power Darlington transistors manufactured by the epitaxial base process, designed for general purpose amplifier and low speed switching applications where high gain is required.

**MARKING: FULL PART NUMBER**

**MAXIMUM RATINGS:** ( $T_C=25^\circ\text{C}$ )

Collector-Base Voltage  
Collector-Emitter Voltage  
Emitter-Base Voltage  
Continuous Collector Current  
Peak Collector Current  
Continuous Base Current  
Power Dissipation  
Operating and Storage Junction Temperature  
Thermal Resistance

| SYMBOL         | TIP140 | TIP141      | TIP142 | UNITS              |
|----------------|--------|-------------|--------|--------------------|
|                | TIP145 | TIP146      | TIP147 |                    |
| $V_{CBO}$      | 60     | 80          | 100    | V                  |
| $V_{CEO}$      | 60     | 80          | 100    | V                  |
| $V_{EBO}$      |        | 5.0         |        | V                  |
| $I_C$          |        | 10          |        | A                  |
| $I_{CM}$       |        | 20          |        | A                  |
| $I_B$          |        | 0.5         |        | A                  |
| $P_D$          |        | 125         |        | W                  |
| $T_J, T_{stg}$ |        | -65 to +150 |        | $^\circ\text{C}$   |
| $\theta_{JC}$  |        | 1.0         |        | $^\circ\text{C/W}$ |

**ELECTRICAL CHARACTERISTICS:** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

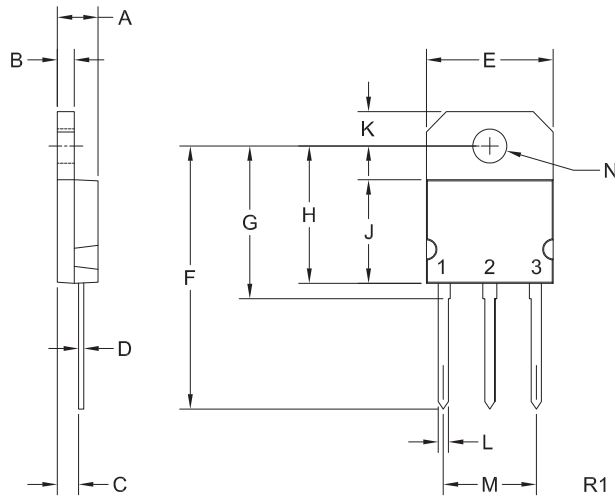
| SYMBOL        | TEST CONDITIONS  | MIN  | TYP | MAX | UNITS         |
|---------------|--|------|-----|-----|---------------|
| $I_{CBO}$     | $V_{CB}=\text{Rated } V_{CBO}$                             |      |     | 1.0 | mA            |
| $I_{CEO}$     | $V_{CE}=\frac{1}{2}\text{Rated } V_{CEO}$                  |      |     | 2.0 | mA            |
| $I_{EBO}$     | $V_{EB}=5.0\text{V}$                                       |      |     | 2.0 | mA            |
| $BV_{CEO}$    | $I_C=30\text{mA}$ (TIP140, TIP145)                         | 60   |     |     | V             |
| $BV_{CEO}$    | $I_C=30\text{mA}$ (TIP141, TIP146)                         | 80   |     |     | V             |
| $BV_{CEO}$    | $I_C=30\text{mA}$ (TIP142, TIP147)                         | 100  |     |     | V             |
| $V_{CE(SAT)}$ | $I_C=5.0\text{A}, I_B=10\text{mA}$                         |      |     | 2.0 | V             |
| $V_{CE(SAT)}$ | $I_C=10\text{A}, I_B=40\text{mA}$                          |      |     | 3.0 | V             |
| $V_{BE(ON)}$  | $V_{CE}=4.0\text{V}, I_C=10\text{A}$                       |      |     | 3.0 | V             |
| $V_F$         | $I_F=10\text{A}$   |      |     | 2.8 | V             |
| $h_{FE}$      | $V_{CE}=4.0\text{V}, I_C=5.0\text{A}$                      | 1.0K |     |     |               |
| $h_{FE}$      | $V_{CE}=4.0\text{V}, I_C=10\text{A}$                       | 500  |     |     |               |
| $t_{on}$      | $I_C=10\text{A}, I_{B1}=I_{B2}=40\text{mA}, R_L=3.0\Omega$ |      | 0.9 |     | $\mu\text{s}$ |
| $t_{off}$     | $I_C=10\text{A}, I_{B1}=I_{B2}=40\text{mA}, R_L=3.0\Omega$ |      | 4.0 |     | $\mu\text{s}$ |

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**TO-218 TRANSISTOR CASE - MECHANICAL OUTLINE**



**LEAD CODE:**  
 1) Base  
 2) Collector  
 3) Emitter  
 Tab) Collector

**MARKING:  
 FULL PART NUMBER**

| SYMBOL | INCHES |       | MILLIMETERS |       |
|--------|--------|-------|-------------|-------|
|        | MIN    | MAX   | MIN         | MAX   |
| A      | 0.185  | 0.193 | 4.70        | 4.90  |
| B      | 0.047  | 0.082 | 1.20        | 2.08  |
| C      | 0.098  |       | 2.49        |       |
| D      | 0.019  | 0.030 | 0.48        | 0.76  |
| E      | 0.578  | 0.598 | 14.68       | 15.19 |
| F      | 1.220  |       | 30.99       |       |
| G      | 0.708  |       | 17.98       |       |
| H      | -      | 0.637 | -           | 16.18 |
| J      | -      | 0.480 | -           | 12.19 |
| K      | 0.155  | 0.163 | 3.94        | 4.14  |
| L      | 0.043  | 0.051 | 1.09        | 1.30  |
| M      | 0.425  | 0.437 | 10.80       | 11.10 |
| N      | 0.157  | 0.161 | 3.99        | 4.09  |

TO-218 Transistor (REV: R1)

R3 (23-December 2015)

## OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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### PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

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### DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2<sup>nd</sup> day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

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### REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix "TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix "PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

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### CONTACT US

#### Corporate Headquarters & Customer Support Team

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145 Adams Avenue  
Hauppauge, NY 11788 USA  
Main Tel: (631) 435-1110  
Main Fax: (631) 435-1824  
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[www.centrasemi.com](http://www.centrasemi.com)

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**Worldwide Distributors:**  
[www.centrasemi.com/wwdistributors](http://www.centrasemi.com/wwdistributors)

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# Product End of Life Notification

|                           |                  |
|---------------------------|------------------|
| <b>PDN ID:</b>            | PDN01022 Rev:001 |
| <b>Notification Date:</b> | 4/07/17          |
| <b>Last Buy Date:</b>     | 10/04/16         |
| <b>Last Shipment Date</b> | 4/04/17          |

Summary: All devices manufactured in the TO-218 package are discontinued and now classified as End of Life (EOL). Central is in the process of qualifying replacements for certain TO-218 devices in the TO-247 package; items with planned replacements are shown below. Rev:001 of PDN#01022, April 7, 2017 issued to remove TIP36C and TIP36C SL from the PDN to address market demand. Part numbers TIP36C and TIP36C SL are once again active devices.

Although Central Semiconductor Corp. makes every effort to continue to produce devices that have been proclaimed EOL (End of Life) by various manufacturers, it is an accepted industry practice to discontinue certain devices when customer demand falls below a minimum level of sustainability. Accordingly, the following product(s) have been transitioned to End of Life status as part of Central's Product Management Process. Any replacement product will be noted below. The effective date for placing the last purchase order will be six(6) months from the date of this notice and twelve(12) months from the notice date for final shipments; this may be extended if inventory is available.

| <u>Central Part Number</u> | <u>Replacement</u> |
|----------------------------|--------------------|
| BDV64                      | N/A                |
| BDV64A                     | N/A                |
| BDV64B                     | N/A                |
| BDV65                      | N/A                |
| BDV65A                     | N/A                |
| BDV65B                     | N/A                |
| BDW83A                     | N/A                |
| BDW83B                     | N/A                |
| BDW83C                     | N/A                |
| BDW84A                     | N/A                |
| BDW84B                     | N/A                |
| BDW84C                     | N/A                |
| BUV47A                     | N/A                |
| BU426                      | N/A                |
| CEN1356                    | N/A                |
| CQ218-45B                  | N/A                |
| CQ218-45D                  | N/A                |
| CQ218-45M                  | N/A                |
| CQ218-45N                  | N/A                |
| CQ218I-25B                 | N/A                |
| CQ218I-25D                 | N/A                |
| CQ218I-25M                 | N/A                |
| CQ218I-25N                 | N/A                |
| CQ218I-40B                 | N/A                |
| CQ218I-40D                 | N/A                |
| CQ218I-40M                 | N/A                |
| CQ218I-40N                 | N/A                |
| CS218-35B                  | N/A                |
| CS218-35D                  | N/A                |
| CS218-35M                  | N/A                |
| CS218-35N                  | N/A                |
| CS218-35P                  | N/A                |
| CS218-35PB                 | N/A                |
| CS218-55B                  | N/A                |
| CS218-55D                  | N/A                |

\*\*\* CONTINUED \*\*\*

DISCLAIMER: This End of Life (EOL) notification is in accordance with JEDEC standard JESD48 - Product Discontinuance. Central Semiconductor Corp. will make every effort to offer life-time buy (LTB) opportunities and/or offer replacement devices to existing customers for discontinued devices, however, one or both may not be possible for all devices. Please contact your local Central Semiconductor sales representative for LTB opportunities/additional information.

# Product End of Life Notification

|                           |                  |
|---------------------------|------------------|
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\*\*\* CONTINUED FROM PRIOR PAGE \*\*\*

| <u>Central Part Number</u> | <u>Replacement</u> |
|----------------------------|--------------------|
| CS218-55M                  | N/A                |
| CS218-55N                  | N/A                |
| CS218-55P                  | N/A                |
| CS218-55PB                 | N/A                |
| CS218I-30B                 | N/A                |
| CS218I-30D                 | N/A                |
| CS218I-30M                 | N/A                |
| CS218I-30N                 | N/A                |
| CS218I-30P                 | N/A                |
| CS218I-30PB                | N/A                |
| CS218I-50B                 | N/A                |
| CS218I-50D                 | N/A                |
| CS218I-50M                 | N/A                |
| CS218I-50N                 | N/A                |
| CS218I-50P                 | N/A                |
| CS218I-50PB                | N/A                |
| TIP140                     | TIP142 TO-247 H    |
| TIP141                     | TIP142 TO-247 H    |
| TIP142                     | TIP142 TO-247 H    |
| TIP145                     | TIP147 TO-247 H    |
| TIP146                     | TIP147 TO-247 H    |
| TIP147                     | TIP147 TO-247 H    |
| TIP2955                    | N/A                |
| TIP3055                    | N/A                |
| TIP33A                     | TIP35C TO-247 H    |
| TIP33B                     | TIP35C TO-247 H    |
| TIP33C                     | TIP35C TO-247 H    |
| TIP34A                     | TIP36C TO-247 H    |
| TIP34B                     | TIP36C TO-247 H    |
| TIP34C                     | TIP36C TO-247 H    |
| TIP35A                     | TIP35C TO-247 H    |
| TIP35B                     | TIP35C TO-247 H    |
| TIP35C                     | TIP35C TO-247 H    |
| TIP35C SL                  | TIP35C TO-247 H    |
| TIP36                      | TIP36C TO-247 H    |
| TIP36A                     | TIP36C TO-247 H    |
| TIP36B                     | TIP36C TO-247 H    |
| TIP36B SL                  | TIP36C TO-247 H    |

Central would be happy to assist you by providing additional information or technical data to help locate an alternate source if we have no replacement available. Please email your requests to [engineering@centralsemi.com](mailto:engineering@centralsemi.com).

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