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ON Semiconductor®

www.onsemi.com

CPH3351

Power MOSFET -60V, 250mΩ, -1.8A, Single P-Channel

Features

- Low On-Resistance
- 4V Drive
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS Compliance

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Value | Unit |
|--|-----------|-------------|------------------|
| Drain to Source Voltage | V_{DSS} | -60 | V |
| Gate to Source Voltage | V_{GSS} | ± 20 | V |
| Drain Current (DC) | I_D | -1.8 | A |
| Drain Current (Pulse) $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$ | I_{DP} | -7.2 | A |
| Power Dissipation When mounted on ceramic substrate ($900\text{mm}^2 \times 0.8\text{mm}$) | P_D | 1.0 | W |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

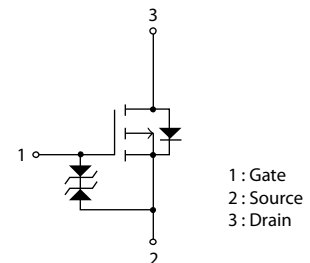
Thermal Resistance Ratings

| Parameter | Symbol | Value | Unit |
|--|-----------------|-------|--------------------|
| Junction to Ambient When mounted on ceramic substrate ($900\text{mm}^2 \times 0.8\text{mm}$) | $R_{\theta JA}$ | 125 | $^\circ\text{C/W}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

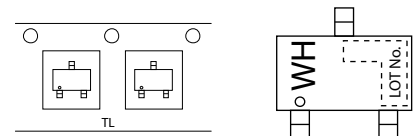
| V_{DSS} | $R_{DS(on)}$ Max | I_D Max |
|-----------|------------------|-----------|
| -60V | 250mΩ@ -10V | -1.8A |
| | 330mΩ@ -4.5V | |
| | 350mΩ@ -4V | |

Electrical Connection P-Channel



Packing Type : TL

Marking



ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

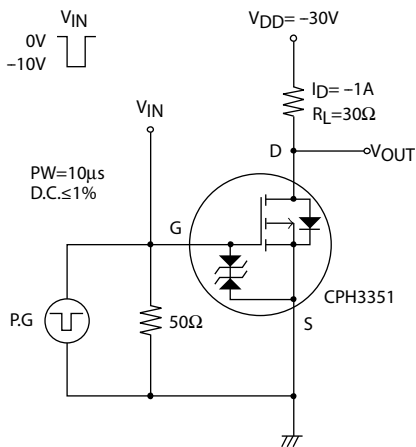
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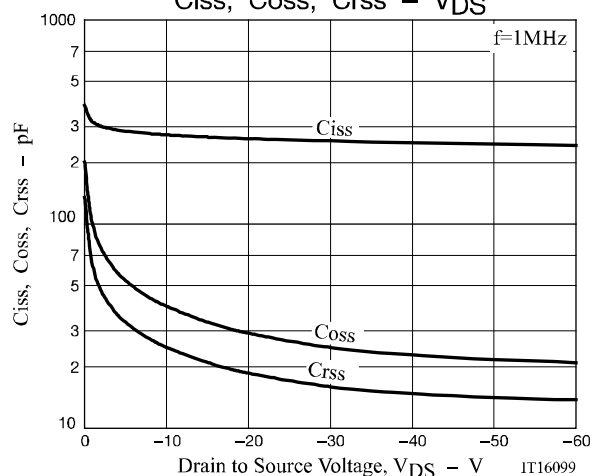
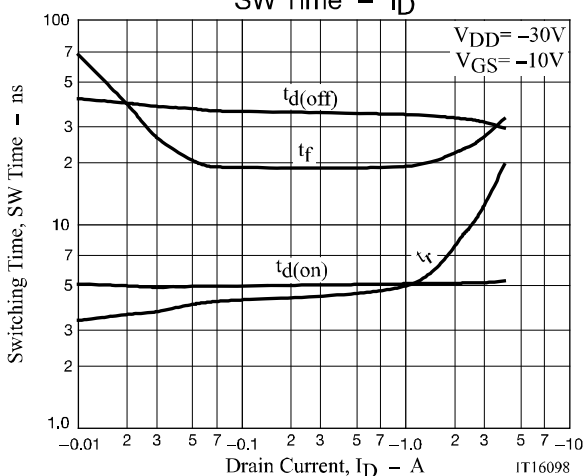
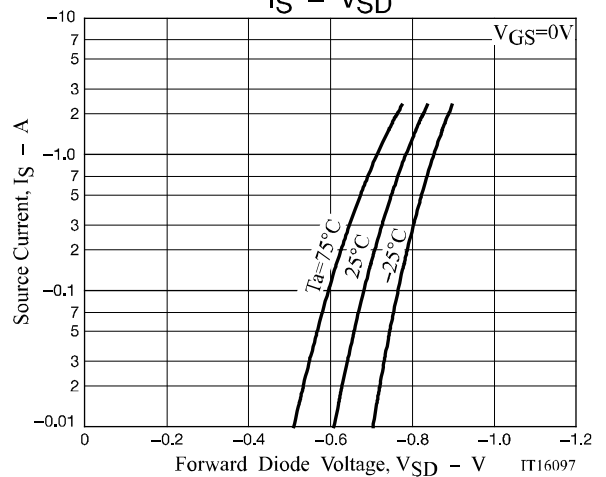
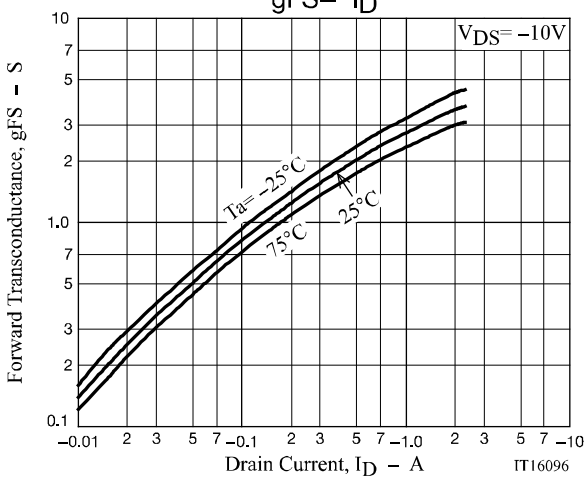
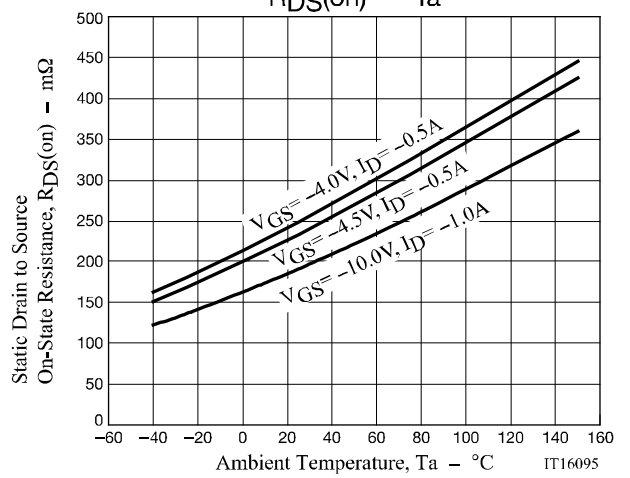
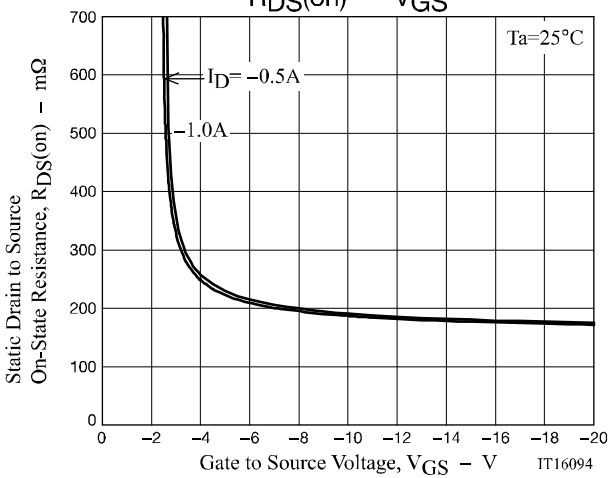
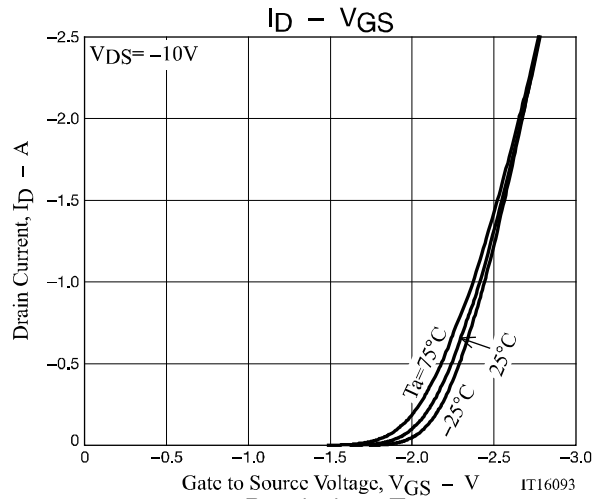
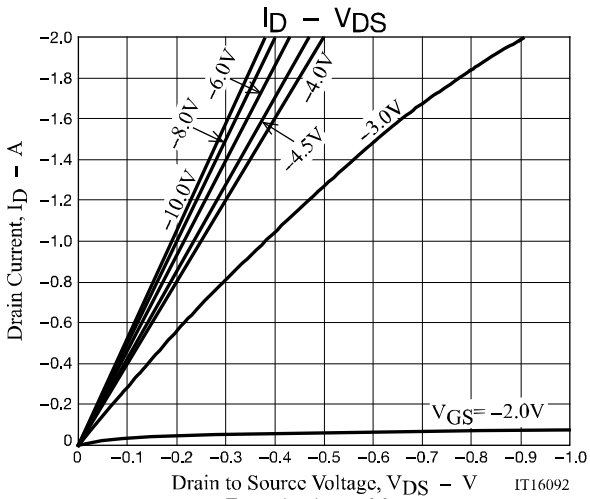
Electrical Characteristics at $T_a = 25^\circ\text{C}$

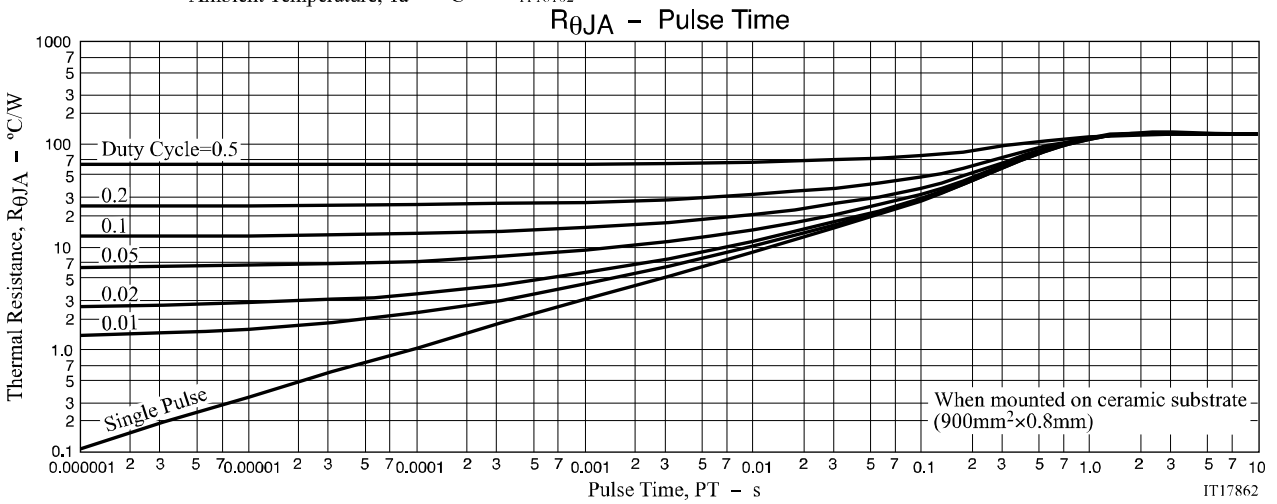
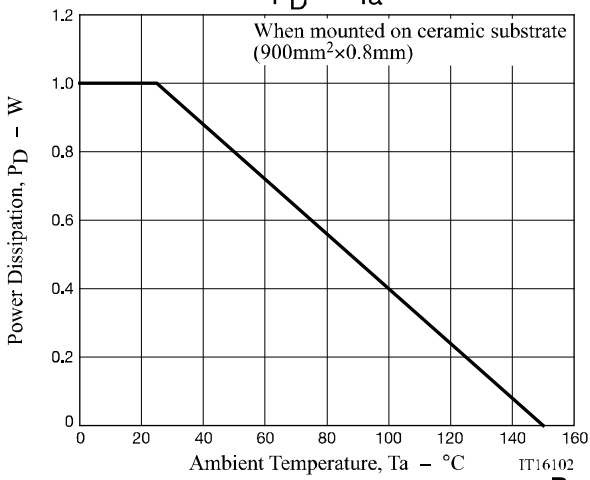
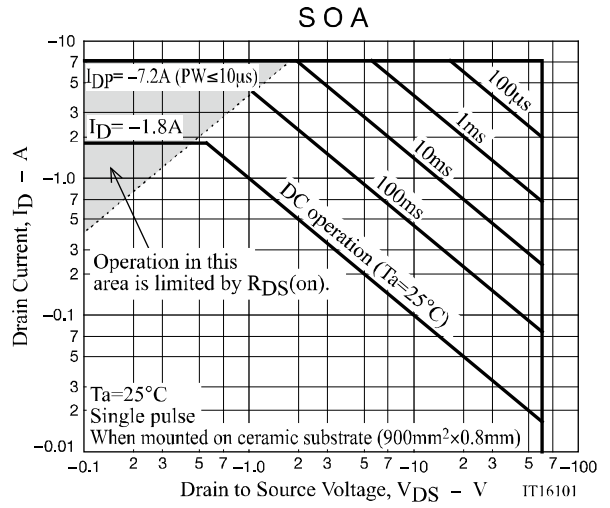
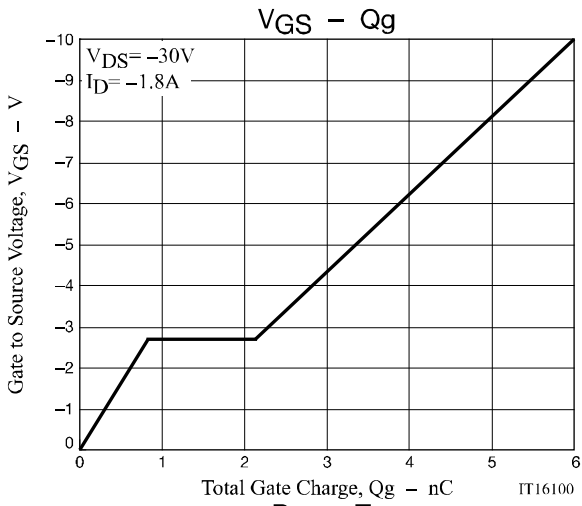
| Parameter | Symbol | Conditions | Value | | | Unit |
|--|---------------|--|---|------|----------|------------------|
| | | | min | typ | max | |
| Drain to Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D = -1\text{mA}$, $V_{GS} = 0\text{V}$ | -60 | | | V |
| Zero-Gate Voltage Drain Current | I_{DSS} | $V_{DS} = -60\text{V}$, $V_{GS} = 0\text{V}$ | | | -1 | μA |
| Gate to Source Leakage Current | I_{GSS} | $V_{GS} = \pm 16\text{V}$, $V_{DS} = 0\text{V}$ | | | ± 10 | μA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = -10\text{V}$, $I_D = -1\text{mA}$ | -1.2 | | -2.6 | V |
| Forward Transconductance | g_{FS} | $V_{DS} = -10\text{V}$, $I_D = -1\text{A}$ | | 2.7 | | S |
| Static Drain to Source On-State Resistance | $R_{DS(on)1}$ | $I_D = -1\text{A}$, $V_{GS} = -10\text{V}$ | | 190 | 250 | $\text{m}\Omega$ |
| | $R_{DS(on)2}$ | $I_D = -0.5\text{A}$, $V_{GS} = -4.5\text{V}$ | | 235 | 330 | $\text{m}\Omega$ |
| | $R_{DS(on)3}$ | $I_D = -0.5\text{A}$, $V_{GS} = -4\text{V}$ | | 250 | 350 | $\text{m}\Omega$ |
| Input Capacitance | C_{iss} | $V_{DS} = -20\text{V}$, $f = 1\text{MHz}$ | | 262 | | pF |
| Output Capacitance | C_{oss} | | | 29 | | pF |
| Reverse Transfer Capacitance | C_{rss} | | | 19 | | pF |
| Turn-ON Delay Time | $t_{d(on)}$ | | | 5.1 | | ns |
| Rise Time | t_r | See specified Test Circuit | | 5.4 | | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | | | 34 | | ns |
| Fall Time | t_f | | | 19 | | ns |
| Total Gate Charge | Q_g | $V_{DS} = -30\text{V}$, $V_{GS} = -10\text{V}$, $I_D = -1.8\text{A}$ | | 6.0 | | nC |
| Gate to Source Charge | Q_{gs} | | | 0.83 | | nC |
| Gate to Drain "Miller" Charge | Q_{gd} | | | 1.3 | | nC |
| Forward Diode Voltage | V_{SD} | | $I_S = -1.8\text{A}$, $V_{GS} = 0\text{V}$ | | -0.82 | -1.2 |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Switching Time Test Circuit







CPH3351

Package Dimensions

CPH3351-TL-H / CPH3351-TL-W

CPH3

CASE 318BA

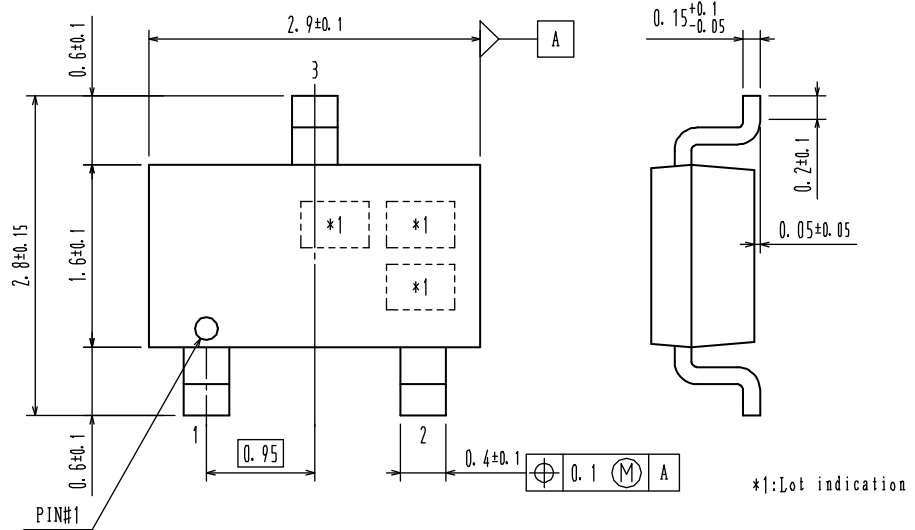
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unit : mm

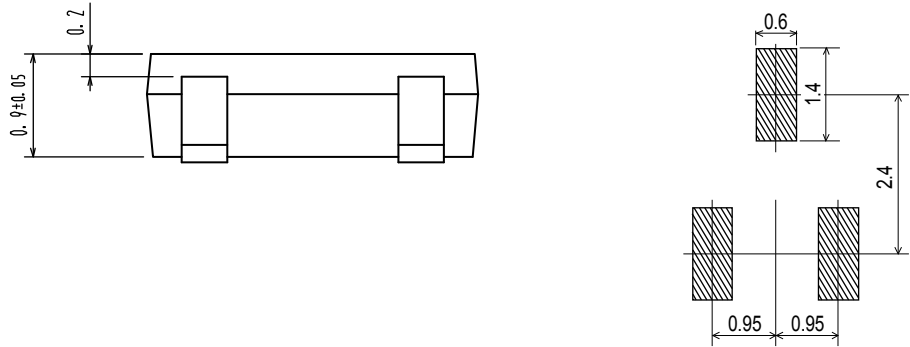
1 : Gate

2 : Source

3 : Drain



Recommended Soldering Footprint



ORDERING INFORMATION

| Device | Package | Shipping | Note |
|--------------|-------------------------------|--------------------------|--------------------------------|
| CPH3351-TL-H | CPH3, SC-59 SOT-23, TO-236 | 3,000 pcs. / Tape & Reel | Pb-Free and Halogen Free |
| CPH3351-TL-W | | | |

Note on usage : Since the CPH3351 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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