

# CPH3351



ON Semiconductor®

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## 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	$V_{DS}$	–60	V
Gate to Source Voltage	$V_{GS}$	$\pm 20$	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 (900mm <sup>2</sup> × 0.8mm)	$P_D$	1.0	W
Junction Temperature	$T_J$	150	°C
Storage Temperature	$T_{stg}$	–55 to +150	°C

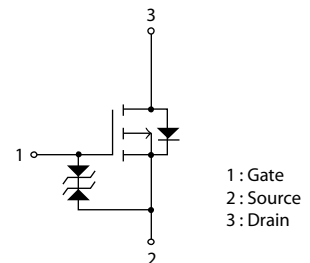
### Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (900mm <sup>2</sup> × 0.8mm)	$R_{\theta JA}$	125	°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.

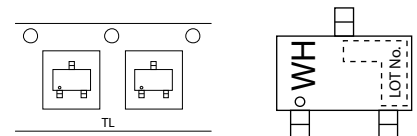
$V_{DS}$	$R_{DS(on)}$ Max	$I_D$ Max
–60V	250mΩ@ –10V	–1.8A
	330mΩ@ –4.5V	
	350mΩ@ –4V	

### Electrical Connection P-Channel



Packing Type : TL

Marking



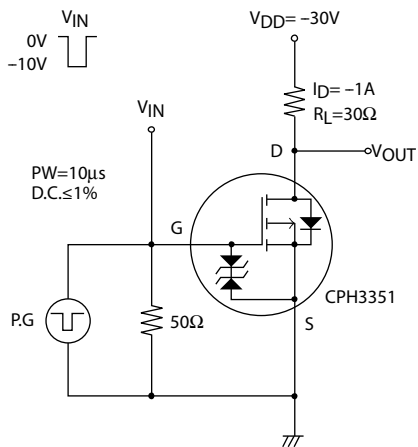
### ORDERING INFORMATION

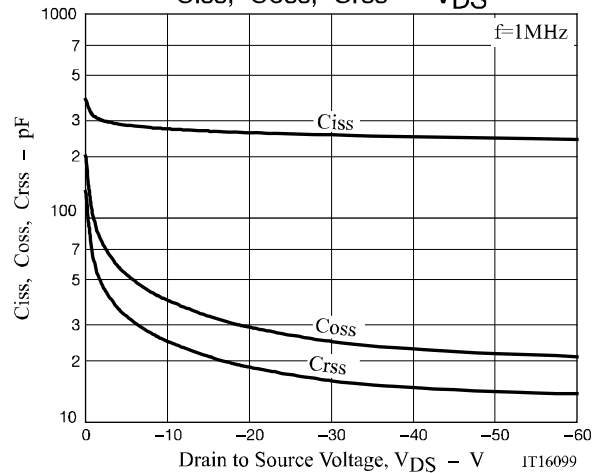
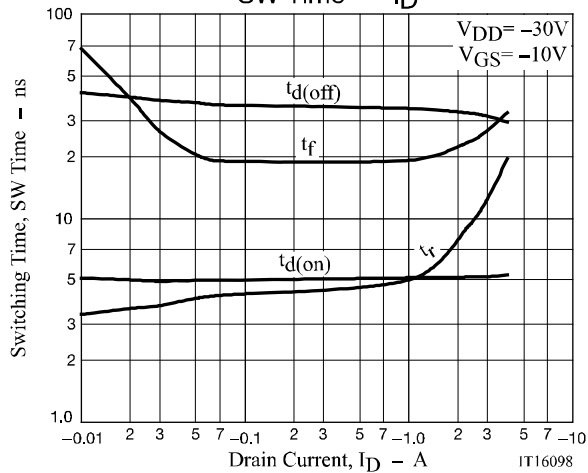
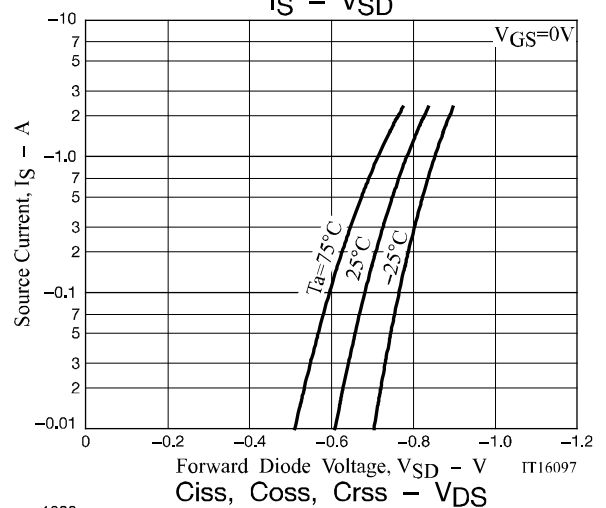
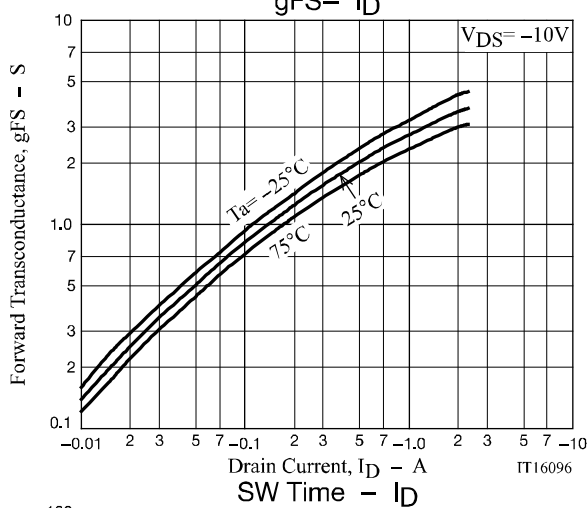
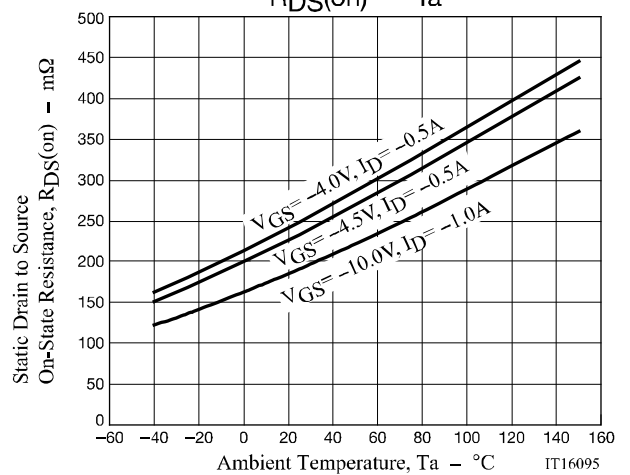
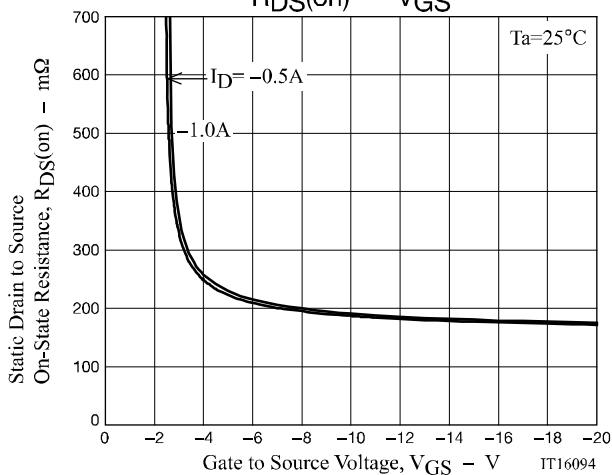
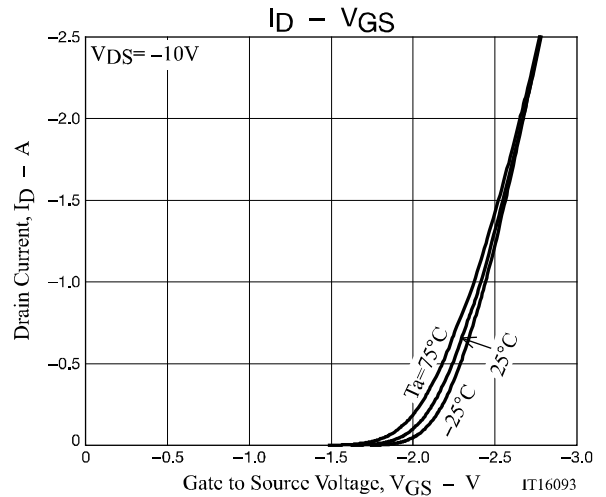
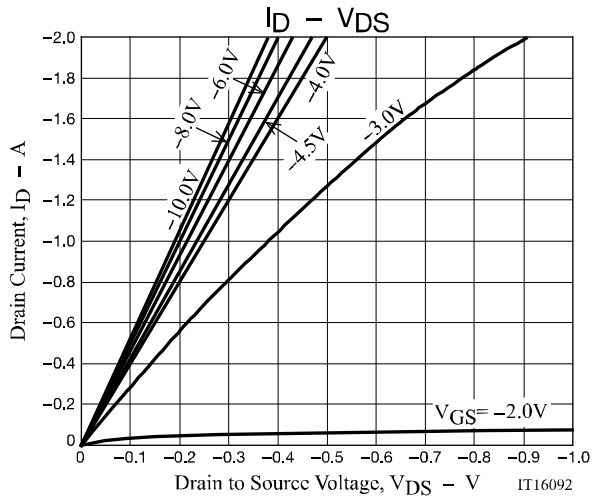
See detailed ordering and shipping information on page 5 of this data sheet.

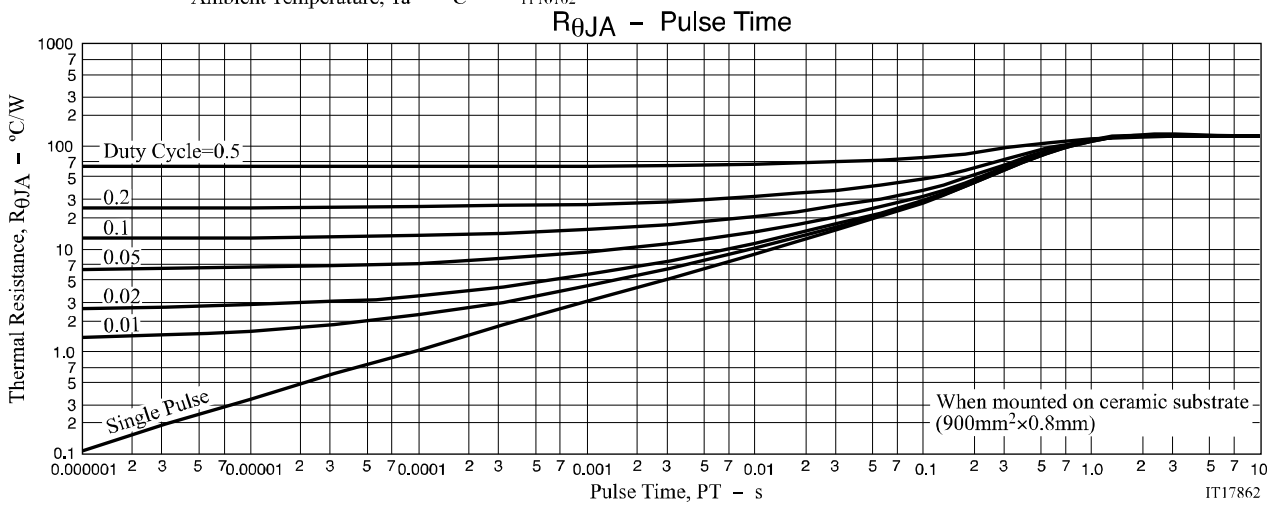
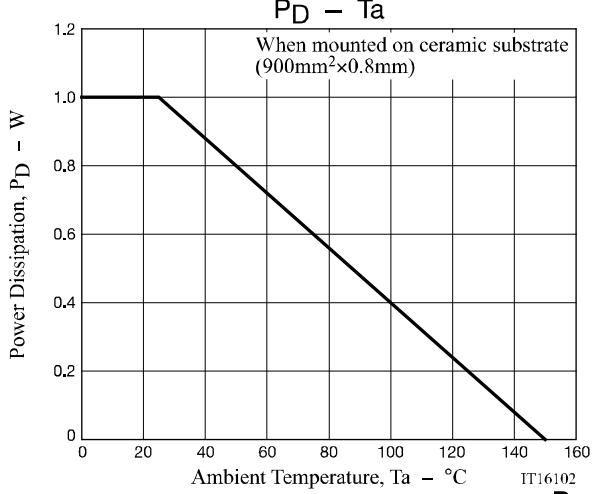
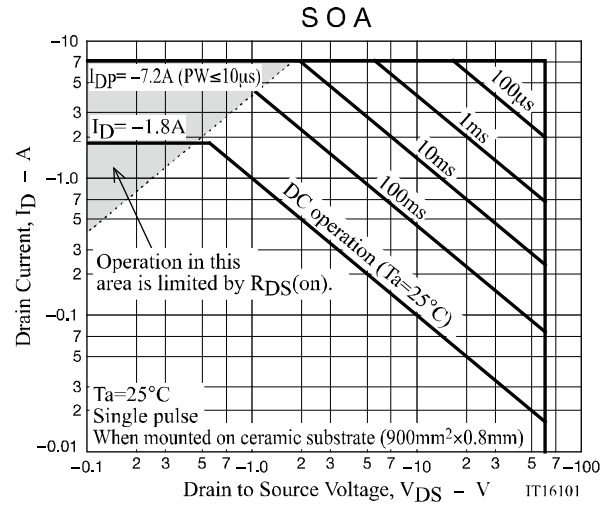
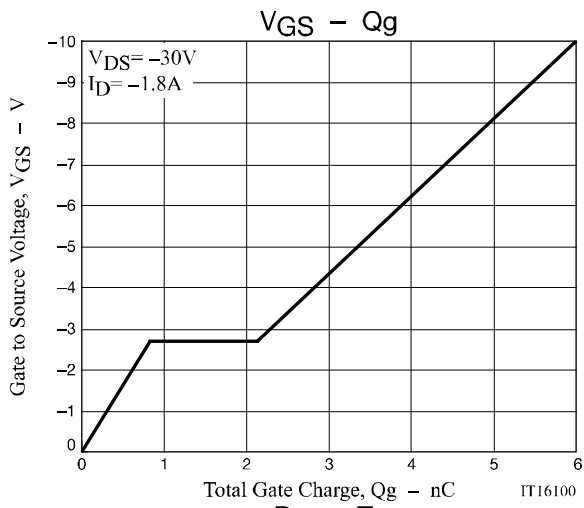
**Electrical Characteristics** at  $T_a = 25^{\circ}\text{C}$ 

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	$\mu\text{A}$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 16\text{V}$ , $V_{DS} = 0\text{V}$			$\pm 10$	$\mu\text{A}$
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	$t_{d(on)}$	See specified Test Circuit		5.1		ns
Rise Time	$t_r$			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	V

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**







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