

# MOSFET - Power, Single N-Channel

**35 V, 104 mΩ, 3 A**

## CPH3455

### Description

This Power MOSFET is produced using onsemi's trench technology, which is specifically designed to minimize gate charge and low on resistance. This device is suitable for applications with low gate charge driving or low on resistance requirements.

### Features

- Low On-Resistance
- 4V Drive
- Pb-Free, Halogen Free and RoHS Compliance

### Typical Applications

- Load Switch
- Motor Drive

### MAXIMUM RATINGS (T<sub>J</sub> = 25°C unless otherwise noted) (Note 1)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>	35	V
Gate-to-Source Voltage	V <sub>GSS</sub>	±20	V
Drain Current (DC)	I <sub>D</sub>	3	A
Drain Current (Pulse) PW ≤ 10 μs, duty cycle ≤ 1%	I <sub>DP</sub>	12	A
Power Dissipation When mounted on ceramic substrate (900 mm <sup>2</sup> × 0.8 mm)	P <sub>D</sub>	1	W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

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.

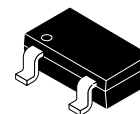
1. This product is designed to "ESD immunity <200 V\*", so please take care when handling.

\*Machine Model

### THERMAL RESISTANCE MAXIMUM RATINGS

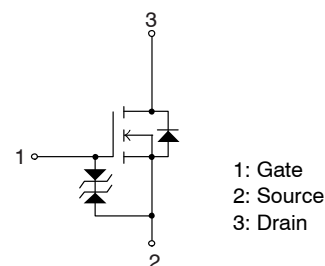
Parameter	Symbol	Value	Unit
Junction-to-Ambient When mounted on ceramic substrate (900 mm <sup>2</sup> × 0.8 mm)	R <sub>θJA</sub>	125	°C/W

V <sub>(BR)DSS</sub>	R <sub>DS(ON) MAX</sub>	I <sub>D MAX</sub>
35 V	104 mΩ @ 10 V	3 A
	173 mΩ @ 4.5 V	
	208 mΩ @ 4 V	

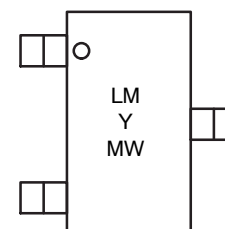


CPH3  
CASE 318BA

### ELECTRICAL CONNECTION N-Channel



### MARKING DIAGRAM



LM = Specific Device Code  
Y = Year  
M = Month  
W = Week

### ORDERING INFORMATION

See detailed ordering, marking and shipping information in the package dimensions section on page 5 of this data sheet.

# CPH3455

## ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Drain to Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> = 1 mA, V <sub>GS</sub> = 0 V	35	-	-	V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 35 V, V <sub>GS</sub> = 0 V	-	-	1	μA
Gate to Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±16 V, V <sub>DS</sub> = 0 V	-	-	±10	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 mA	1.2	-	2.6	V
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1.5 A	-	1.7	-	S
Static Drain to Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> = 1.5 A, V <sub>GS</sub> = 10 V	-	80	104	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> = 0.75 A, V <sub>GS</sub> = 4.5 V	-	123	173	mΩ
	R <sub>DS(on)3</sub>	I <sub>D</sub> = 0.75 A, V <sub>GS</sub> = 4 V	-	148	208	mΩ
Input Capacitance	C <sub>iSS</sub>	V <sub>DS</sub> = 20 V, f = 1 MHz	-	186	-	pF
Output Capacitance	C <sub>oSS</sub>		-	36	-	
Reverse Transfer Capacitance	C <sub>rSS</sub>		-	22	-	
Turn-On Delay Time	t <sub>d(on)</sub>	See specified Test Circuit	-	4.2	-	ns
Rise Time	t <sub>r</sub>		-	4.7	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	15	-	
Fall Time	t <sub>f</sub>		-	5.7	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3 A	-	4	-	nC
Gate-to-Source Charge	Q <sub>gs</sub>		-	0.9	-	
Gate to Drain "Miller" Charge	Q <sub>gd</sub>		-	0.7	-	
Forward Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> = 3 A, V <sub>GS</sub> = 0 V	-	0.86	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

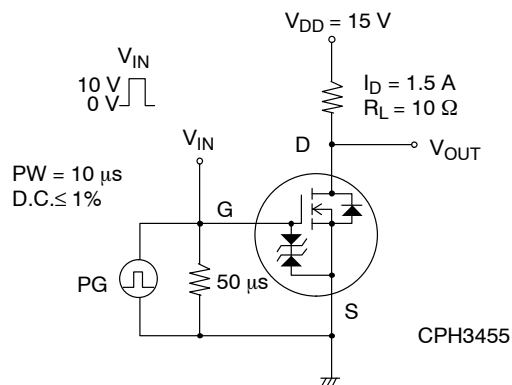


Figure 1. Switching Time Test Circuit

TYPICAL CHARACTERISTICS

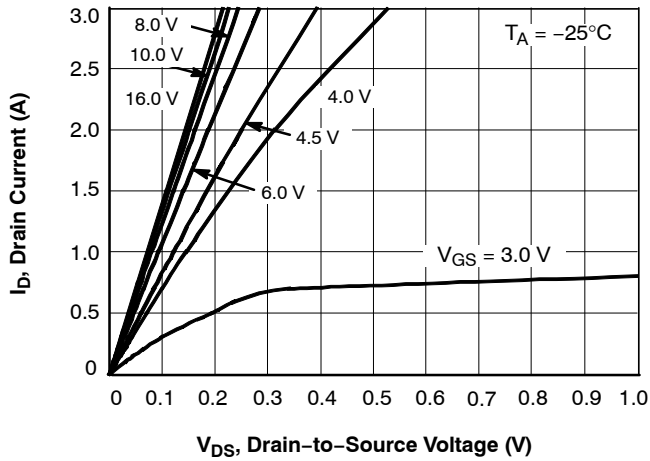


Figure 2.  $I_D - V_{DS}$

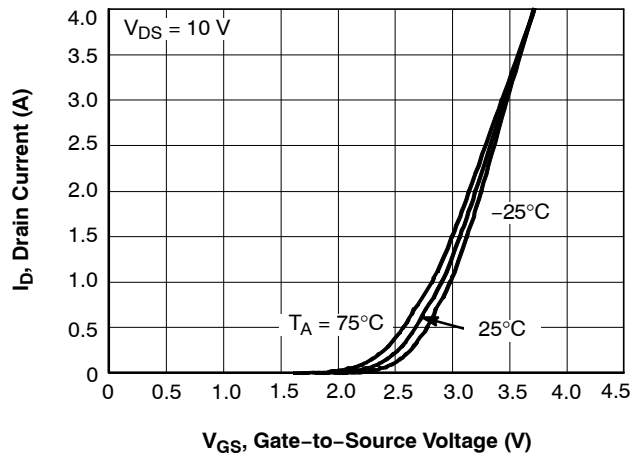


Figure 3.  $I_D - V_{GS}$

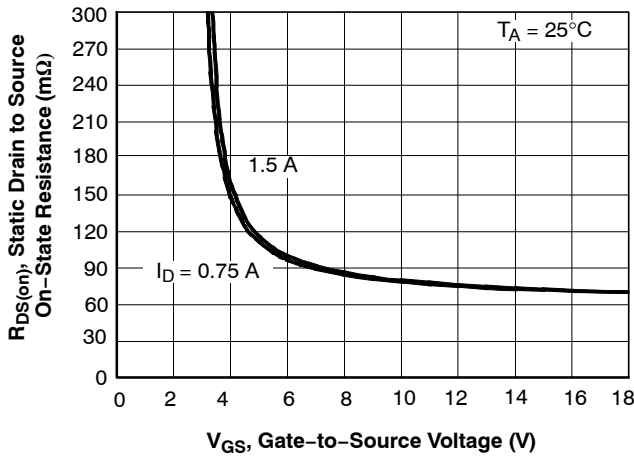


Figure 4.  $R_{DS(on)} - V_{GS}$

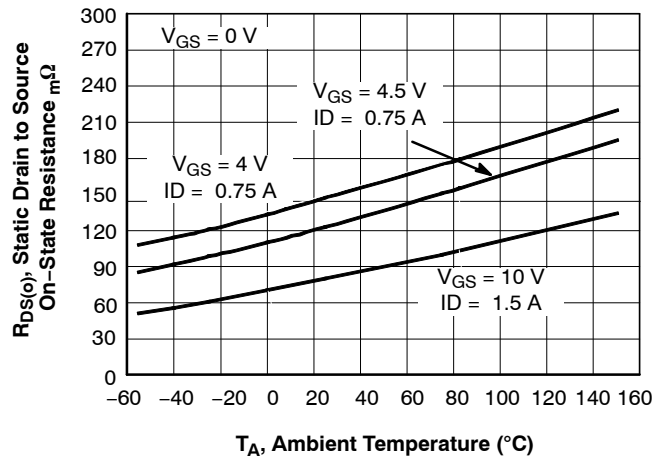


Figure 5.  $R_{DS(on)} - T_A$

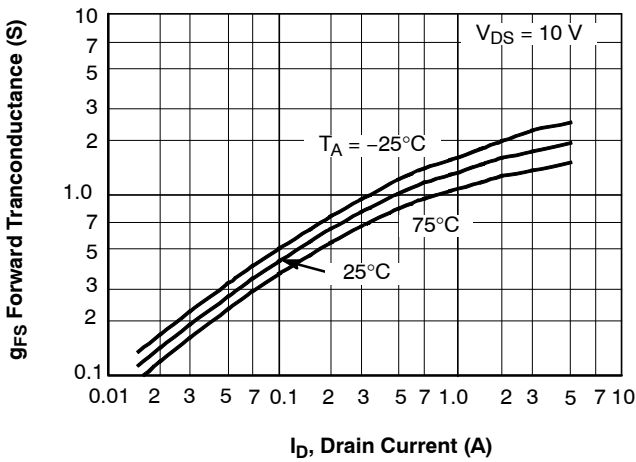


Figure 6.  $g_{FS} - I_D$

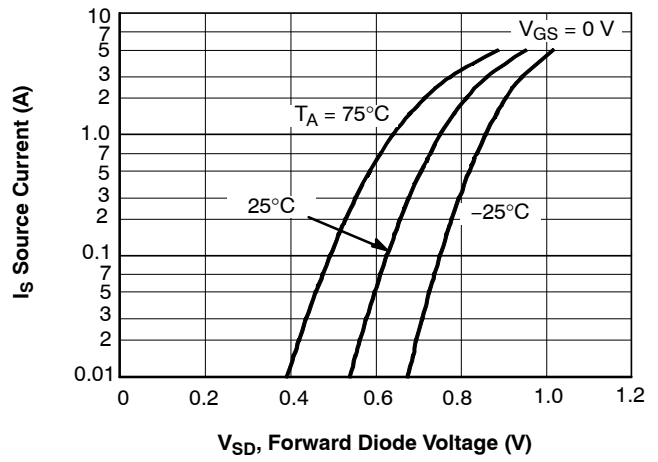


Figure 7.  $I_S - V_{SD}$

TYPICAL CHARACTERISTICS (continued)

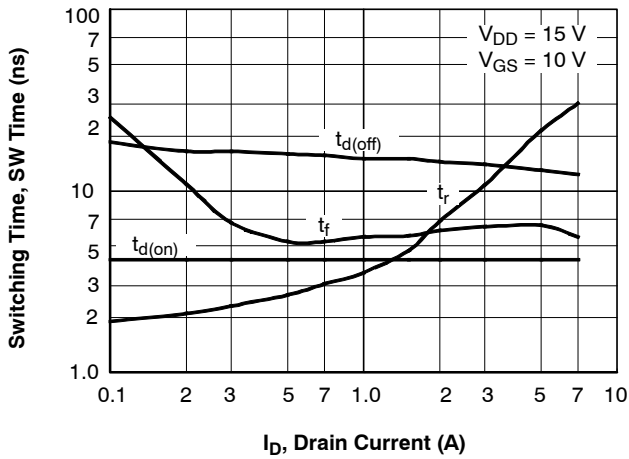


Figure 8. Time (SW) –  $I_D$

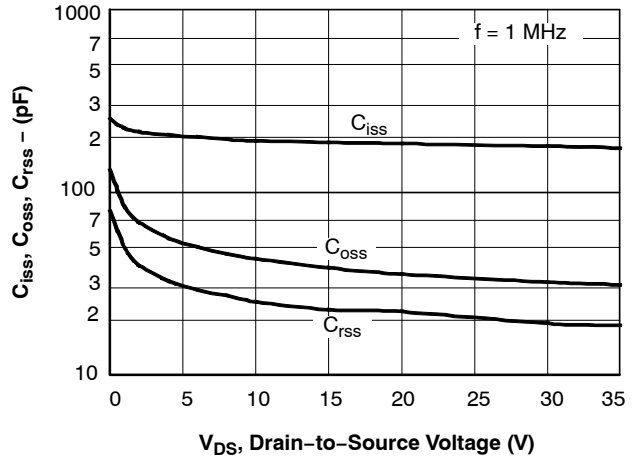


Figure 9.  $V_{DS}$  –  $C_{iss}, C_{oss}, C_{rss}$

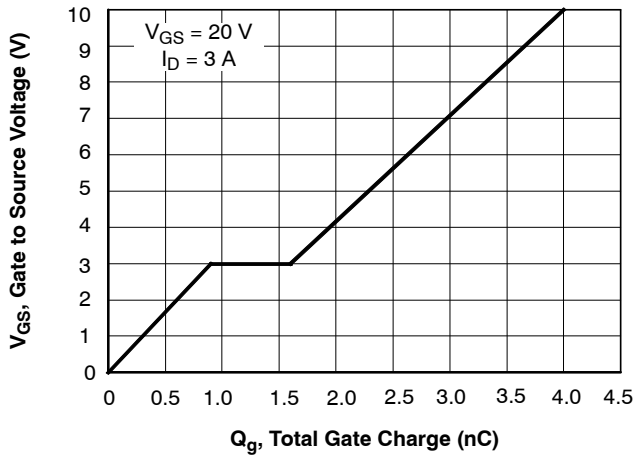


Figure 10.  $V_{GS}$  –  $Q_g$

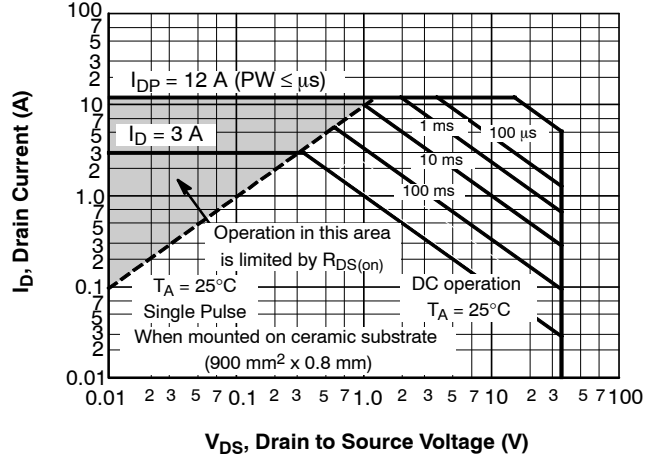


Figure 11. S O A

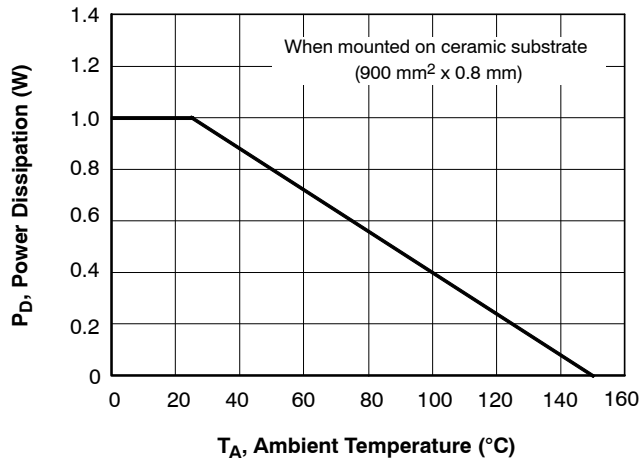


Figure 12.  $P_D$  –  $T_A$

# CPH3455

## TYPICAL CHARACTERISTICS (continued)

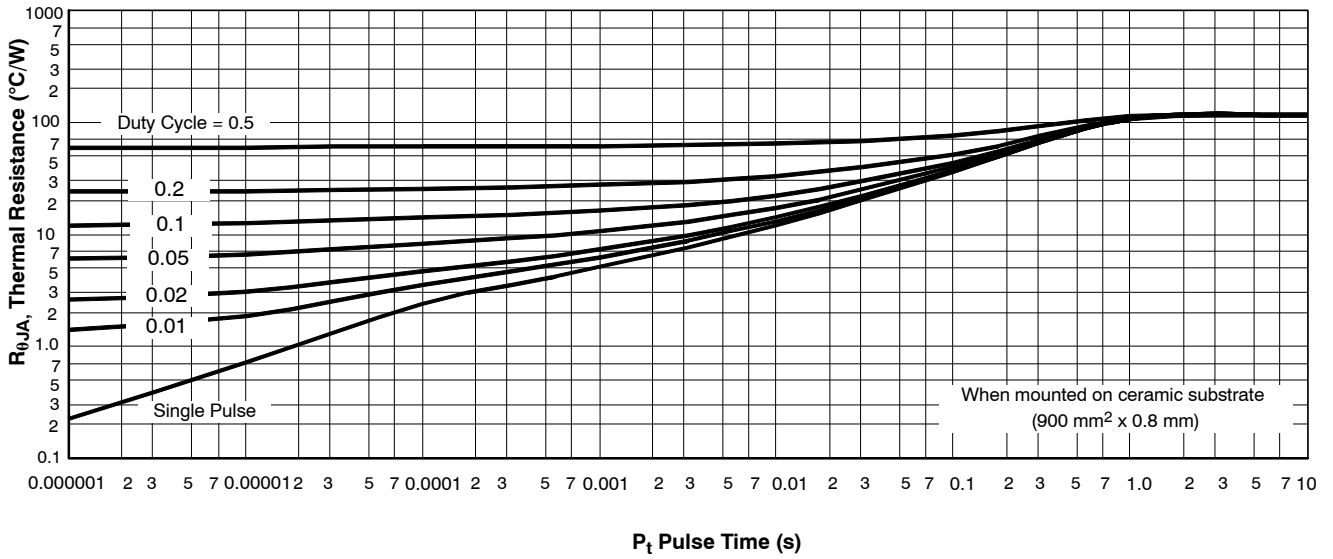


Figure 13.  $R_{\theta JA}$  – Pulse Time

### DEVICE ORDERING INFORMATION

Device	Marking	Package	Shipping <sup>†</sup>
CPH3455-TL-H	LM	CPH3 SC-59, SOT-23, TO-236 (Pb-Free / Halogen Free)	3000 / Tape & Reel

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

\*Note on usage : Since the CPH3455 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.



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