

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	$I_D$ max $T_A = 25^\circ\text{C}$
20V	56m $\Omega$ @ $V_{GS} = 4.5\text{V}$	2.8A
	65m $\Omega$ @ $V_{GS} = 2.5\text{V}$	2.6A
	93m $\Omega$ @ $V_{GS} = 1.8\text{V}$	2.2A
	140m $\Omega$ @ $V_{GS} = 1.5\text{V}$	1.8A

## Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 standards for High Reliability**

## Description and Applications

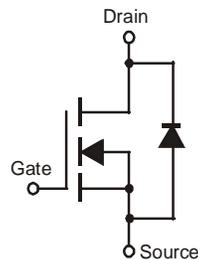
This MOSFET has been designed to minimize the on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- General Purpose Interfacing Switch
- Power Management Functions
- DC-DC Converters
- Analog Switch

## Mechanical Data

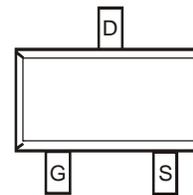
- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Alloy42 leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.027 grams (approximate)

SOT323



Top View

Equivalent Circuit



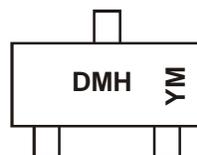
Top View

## Ordering Information (Note 3)

Part Number	Case	Packaging
DMN2065UW-7	SOT323	3000/Tape & Reel

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



DMH = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Y = 2011)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2011	2012	2013	2014	2015	2016	2017
Code	Y	Z	A	B	C	D	E

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	20	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = 25°C T <sub>A</sub> = 70°C	I <sub>D</sub>	2.8 2.3	A
	t < 10s	T <sub>A</sub> = 25°C T <sub>A</sub> = 70°C	I <sub>D</sub>	3.1 2.6	A
Continuous Drain Current (Note 5) V <sub>GS</sub> = 1.8V	Steady State	T <sub>A</sub> = 25°C T <sub>A</sub> = 70°C	I <sub>D</sub>	2.2 1.7	A
	t < 10s	T <sub>A</sub> = 25°C T <sub>A</sub> = 70°C	I <sub>D</sub>	2.4 1.9	A
Pulsed Drain Current (10µs pulse, duty cycle=1%)			I <sub>DM</sub>	30	A
Maximum Body Diode Forward Current (Note 4)			I <sub>S</sub>	1.2	A

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)		P <sub>D</sub>	0.43	W
Thermal Resistance, Junction to Ambient (Note 4)	Steady state	R <sub>θJA</sub>	296	°C/W
	t < 10s		252	°C/W
Total Power Dissipation (Note 5)		P <sub>D</sub>	0.7	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R <sub>θJA</sub>	178	°C/W
	t < 10s		151	°C/W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA
Zero Gate Voltage Drain Current @ T <sub>c</sub> = 25°C	I <sub>DSS</sub>	-	-	1	µA	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±1	µA	V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.35	-	1.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	-	52	56	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 2A
		-	59	65		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 2A
		-	60	93		V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 1A
		-	75	140		V <sub>GS</sub> = 1.5V, I <sub>D</sub> = 0.5A
Forward Transfer Admittance	Y <sub>fs</sub>	-	7	-	S	V <sub>DS</sub> = 5V, I <sub>D</sub> = 3.8A
Diode Forward Voltage	V <sub>SD</sub>	-	0.7	1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	C <sub>iss</sub>	-	400.0	-	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	73.8	-	pF	
Reverse Transfer Capacitance	C <sub>riss</sub>	-	65.6	-	pF	
Total Gate Charge	Q <sub>g</sub>	-	5.4	-	nC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 6A
Gate-Source Charge	Q <sub>gs</sub>	-	0.7	-	nC	
Gate-Drain Charge	Q <sub>gd</sub>	-	1.4	-	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	-	3.5	-	ns	V <sub>DD</sub> = 10V, V <sub>GS</sub> = 5V, R <sub>L</sub> = 1.7Ω, R <sub>G</sub> = 6Ω,
Turn-On Rise Time	t <sub>r</sub>	-	9.7	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	23.8	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	7.2	-	ns	

- Notes:
- Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

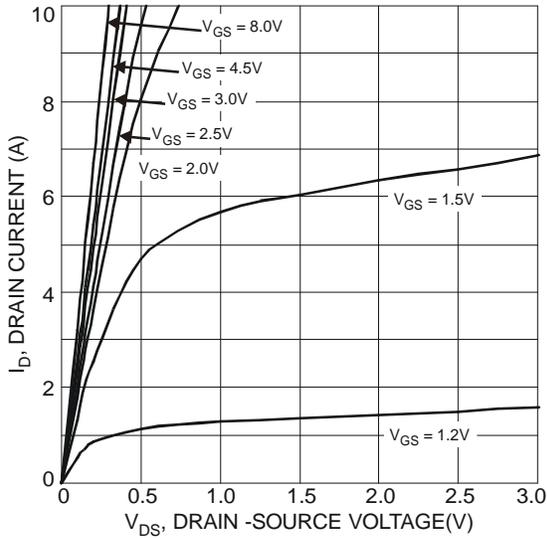


Fig. 1 Typical Output Characteristics

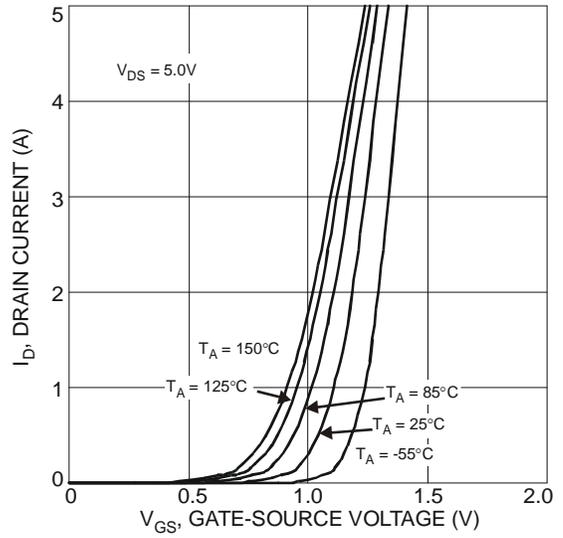


Fig. 2 Typical Transfer Characteristics

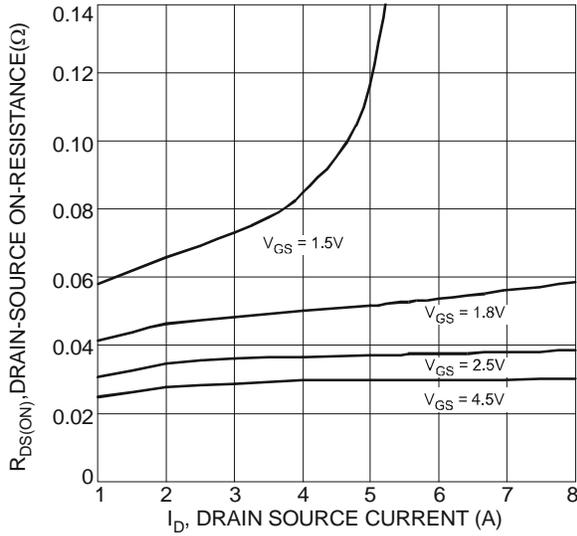


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

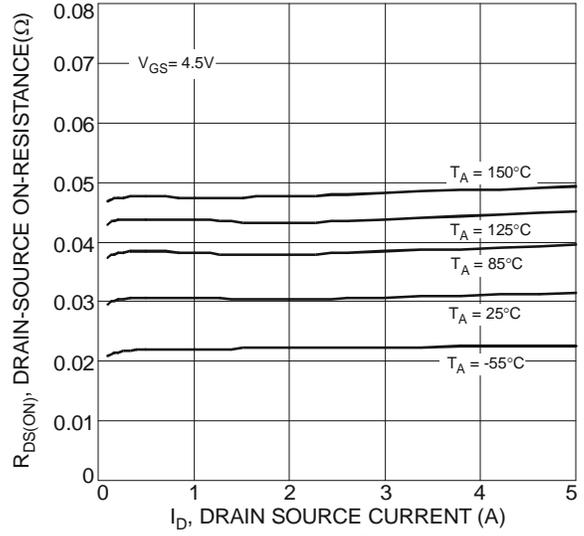


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

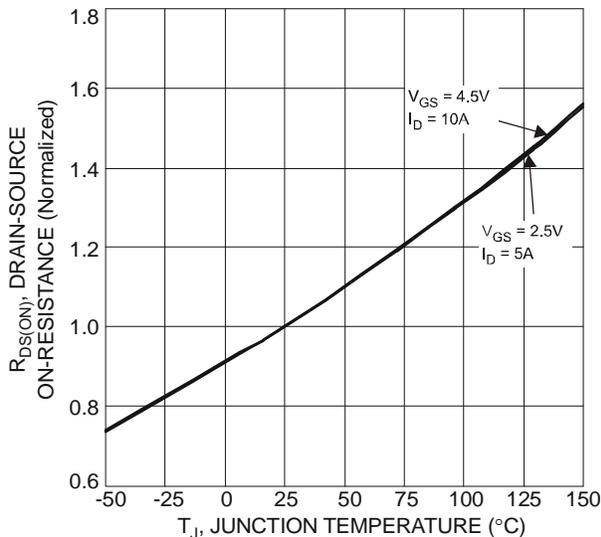


Fig. 5 On-Resistance Variation with Temperature

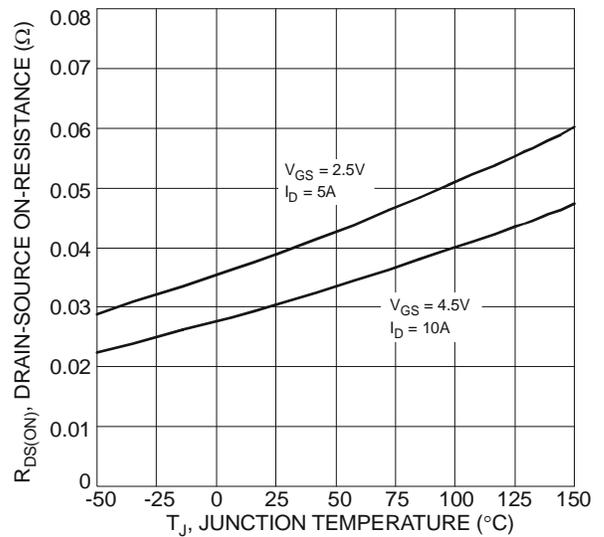


Fig. 6 On-Resistance Variation with Temperature

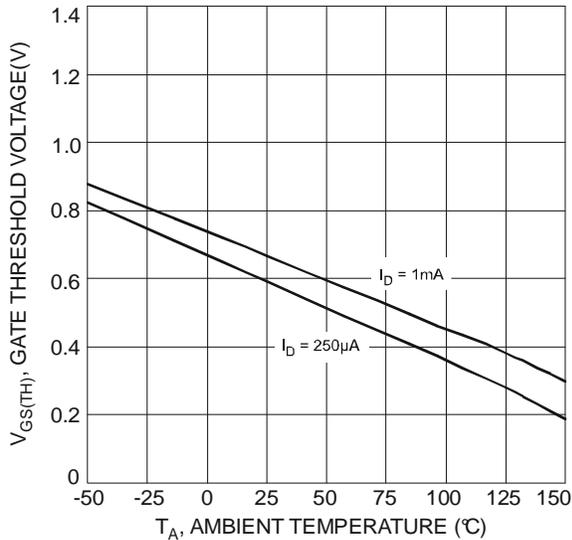


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

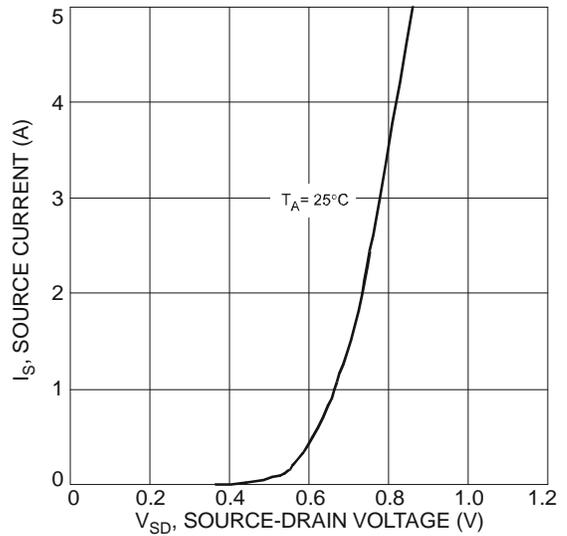


Fig. 8 Diode Forward Voltage vs. Current

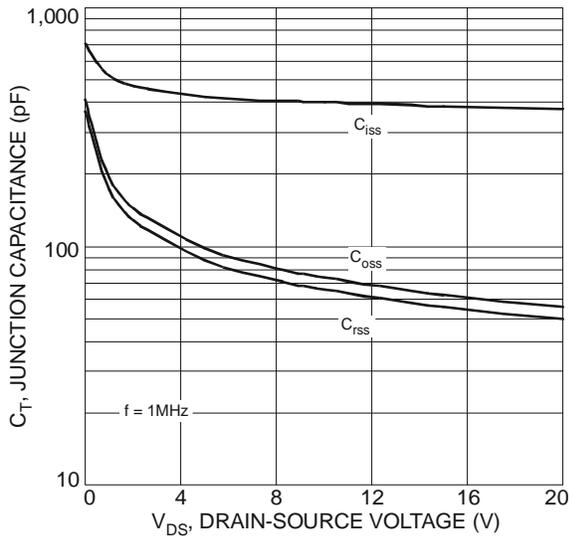


Fig. 9 Typical Junction Capacitance

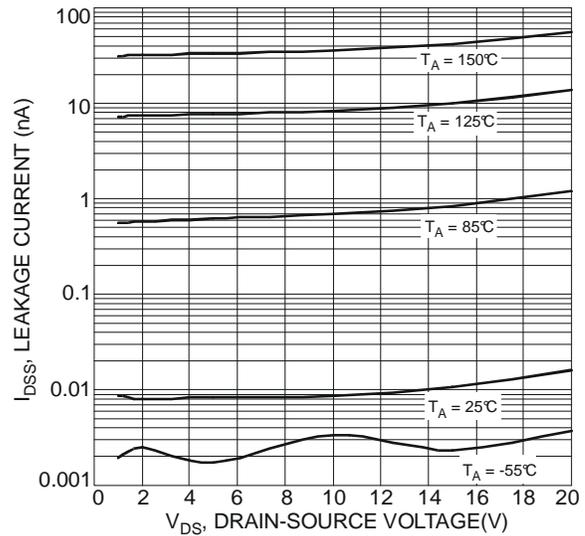


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

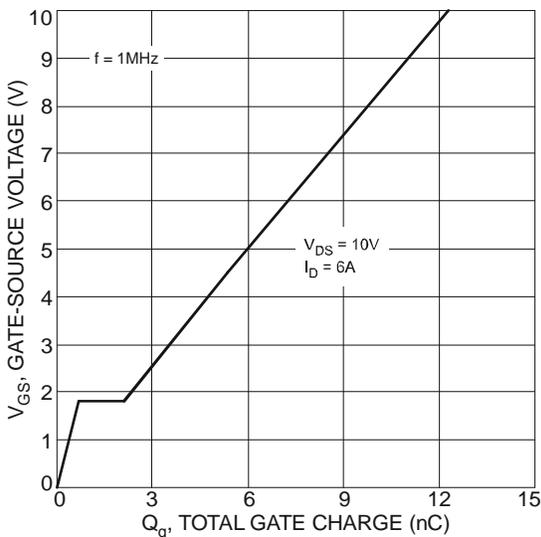


Fig. 11 Gate-Charge Characteristics

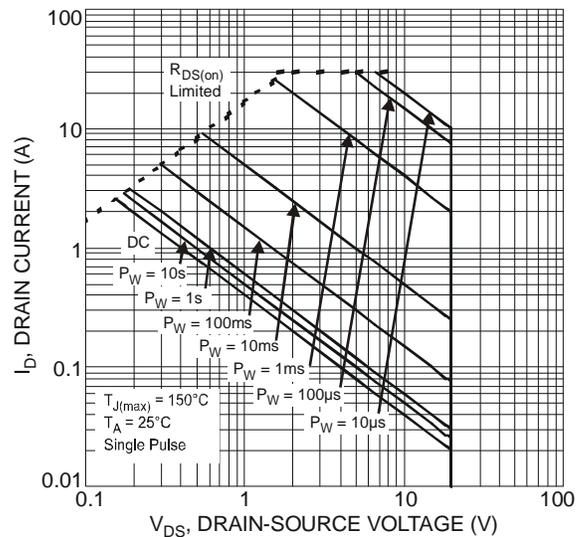


Fig. 12 SOA, Safe Operation Area

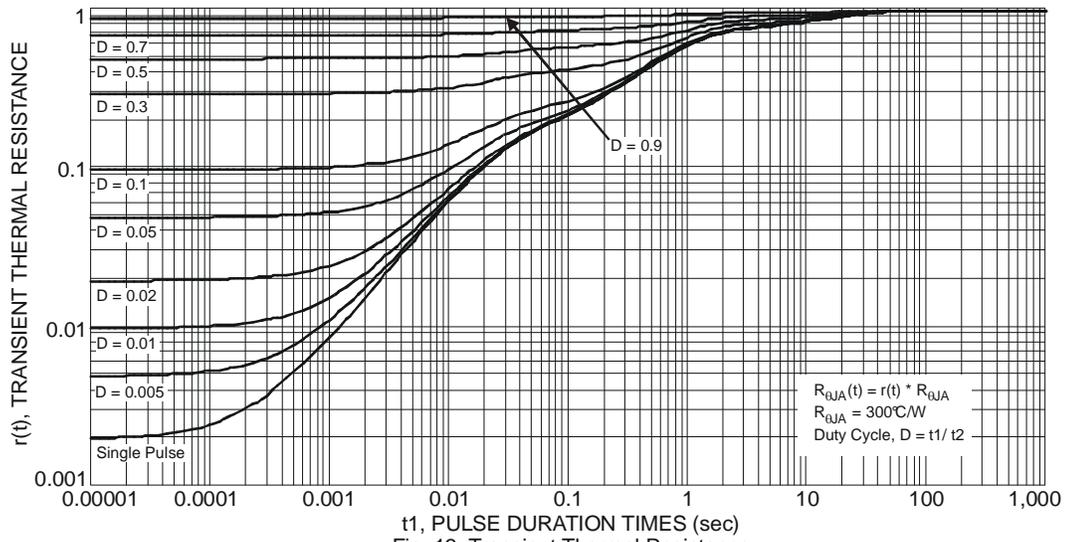
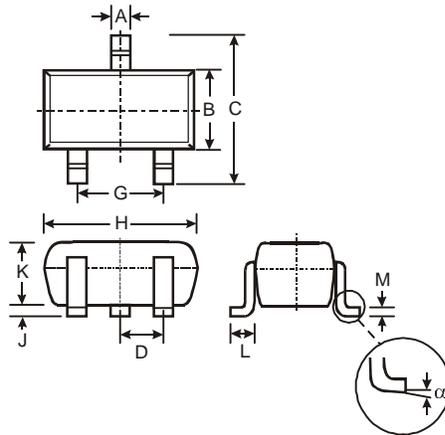


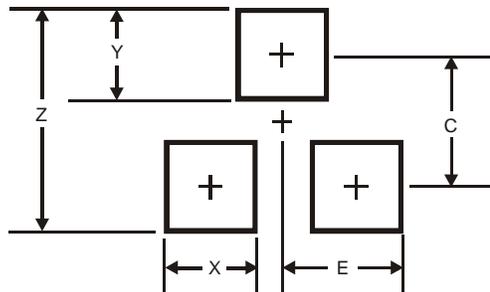
Fig. 13 Transient Thermal Resistance

**Package Outline Dimensions**



SOT323			
Dim	Min	Max	Typ
A	0.25	0.40	0.30
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	-	-	0.65
G	1.20	1.40	1.30
H	1.80	2.20	2.15
J	0.0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.18	0.11
$\alpha$	0°	8°	-
All Dimensions in mm			

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	2.8
X	0.7
Y	0.9
C	1.9
E	1.0

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