

# SCH1331

## Power MOSFET –12V, 84mΩ, –3A, Single P-Channel

This Low-profile High-power MOSFET is produced using ON Semiconductor's trench technology, which is specifically designed to minimize gate charge and ultra low on resistance. This device is suitable for applications with low gate charge driving or ultra low on resistance requirements.

### Features

- Low On-Resistance
- High speed switching
- 1.8V drive
- Low capacitance
- Pb-Free, Halogen Free and RoHS compliance
- Ultra small package SCH6 (1.6mm×1.6mm×0.56mmt)

### Typical Applications

- Battery Switch
- Load Switch
- DC/DC Converter
- Lens Motor Driver

### SPECIFICATIONS

#### ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1)

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

Note 1 : 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.

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

### THERMAL RESISTANCE RATINGS

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

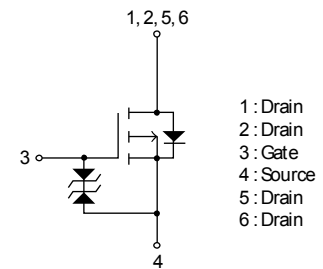


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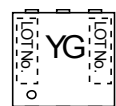
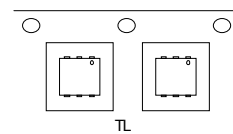
V <sub>DSS</sub>	R <sub>DS(on)</sub> Max	I <sub>D</sub> Max
–12V	84mΩ@ –4.5V	–3A
	126mΩ@ –2.5V	
	230mΩ@ –1.8V	

### ELECTRICAL CONNECTION P-Channel



### PACKING TYPE : TL

### MARKING



### ORDERING INFORMATION

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

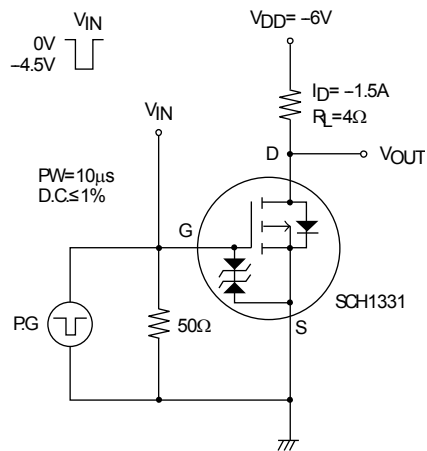
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## ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 3)

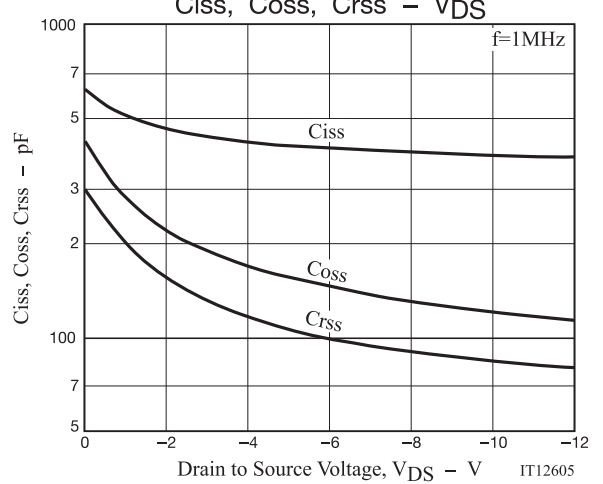
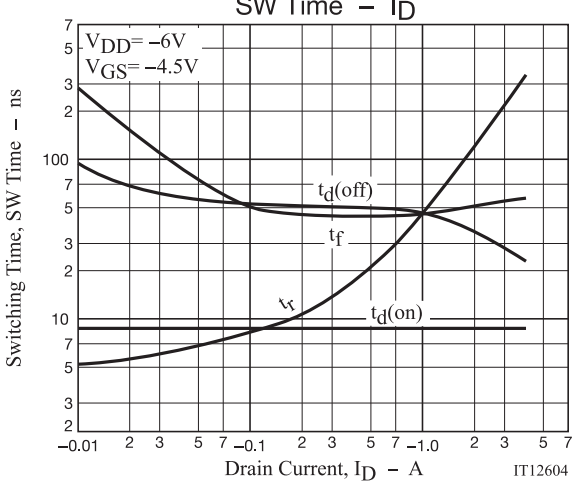
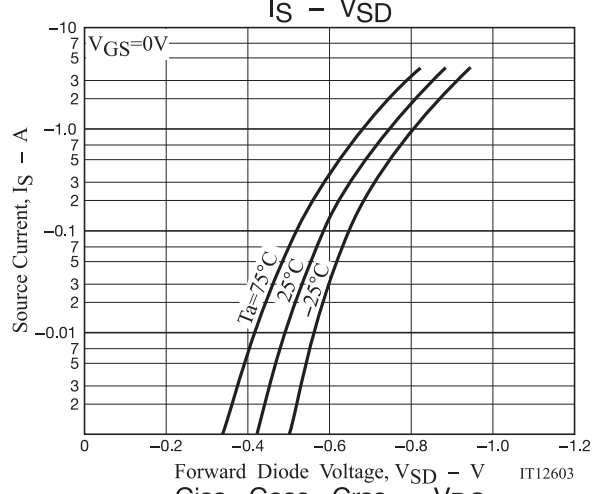
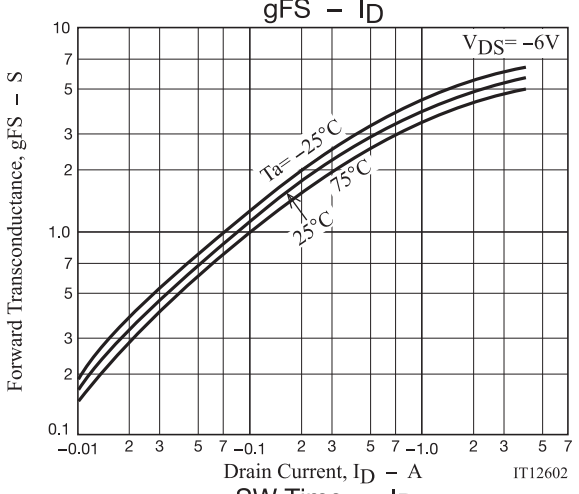
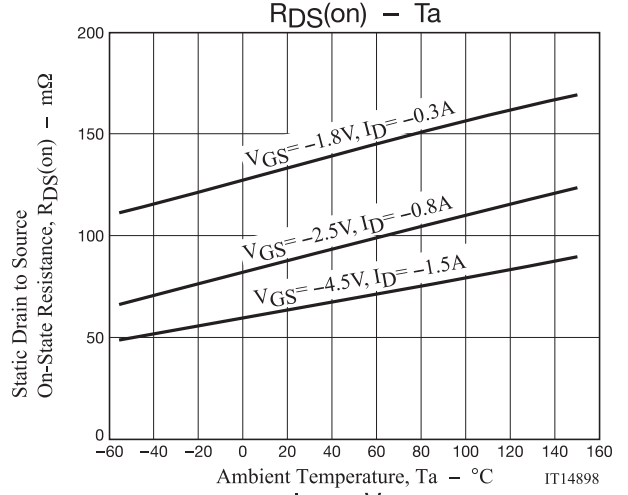
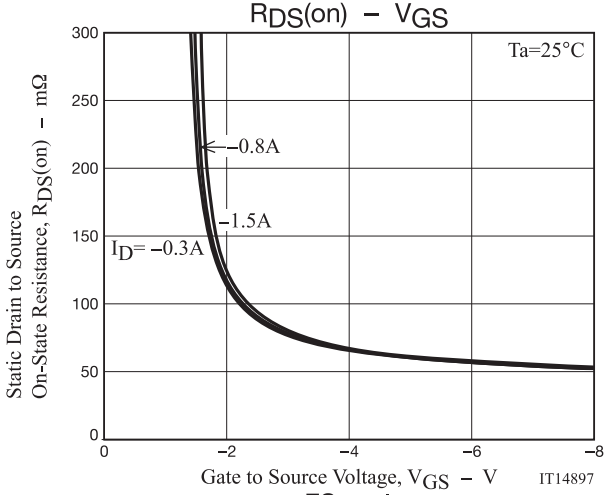
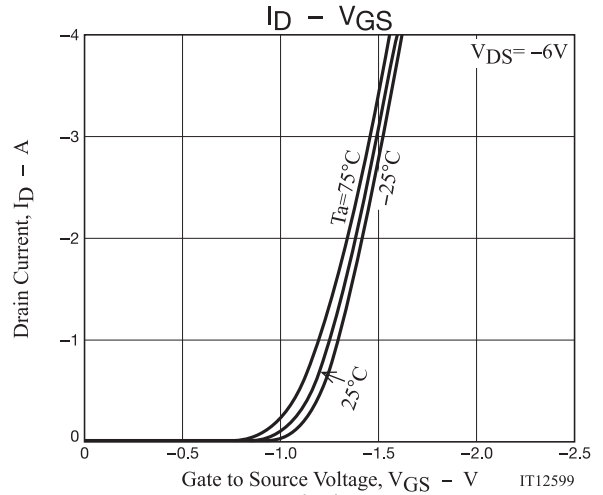
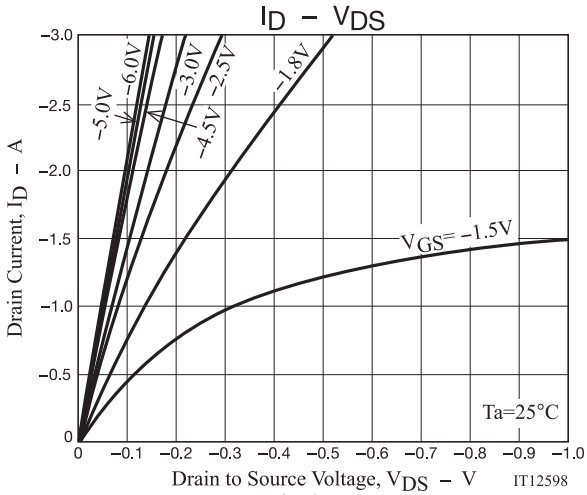
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	V(BR)DSS	I <sub>D</sub> =-1mA, V <sub>GS</sub> =0V	-12			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-12V, V <sub>GS</sub> =0V			-10	μA
Gate to Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V			±10	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =-6V, I <sub>D</sub> =-1mA	-0.4		-1.3	V
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-6V, I <sub>D</sub> =-1.5A	2.7	4.5		S
Static Drain to Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =-1.5A, V <sub>GS</sub> =-4.5V		64	84	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =-0.8A, V <sub>GS</sub> =-2.5V		90	126	mΩ
	R <sub>DS(on)3</sub>	I <sub>D</sub> =-0.3A, V <sub>GS</sub> =-1.8V		135	230	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-6V, f=1MHz		405		pF
Output Capacitance	C <sub>oss</sub>			145		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			100		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit		8.8		ns
Rise Time	t <sub>r</sub>			80		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>			41		ns
Fall Time	t <sub>f</sub>			50		ns
Total Gate Charge	Q <sub>g</sub>				5.6	
Gate to Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =-6V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2.5A		0.7		nC
Gate to Drain "Miller" Charge	Q <sub>gd</sub>			1.6		nC
Forward Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> =-2.5A, V <sub>GS</sub> =0V		-0.82	-1.2	V

Note 3 : 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.

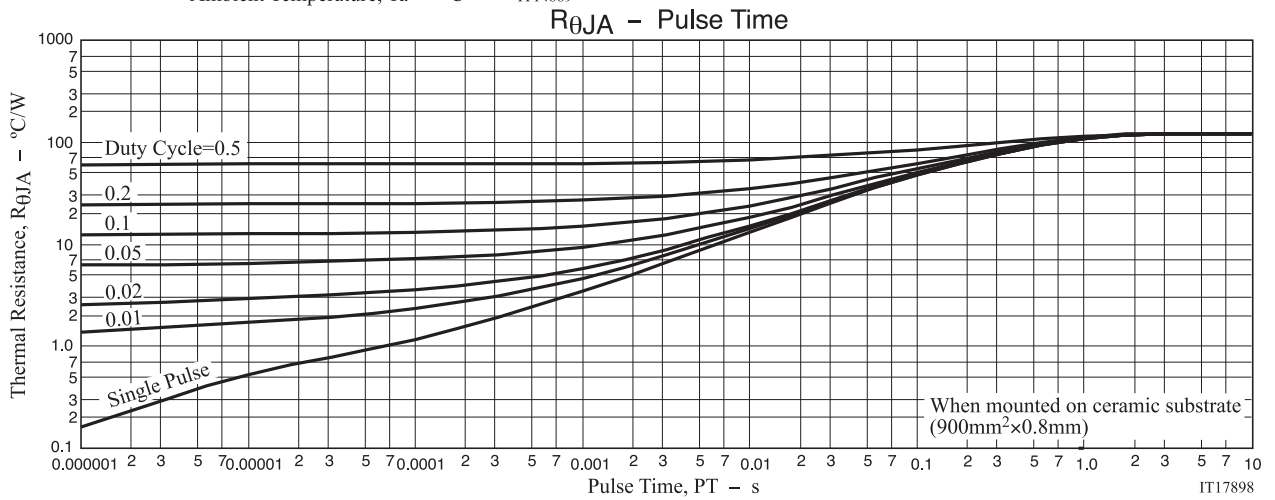
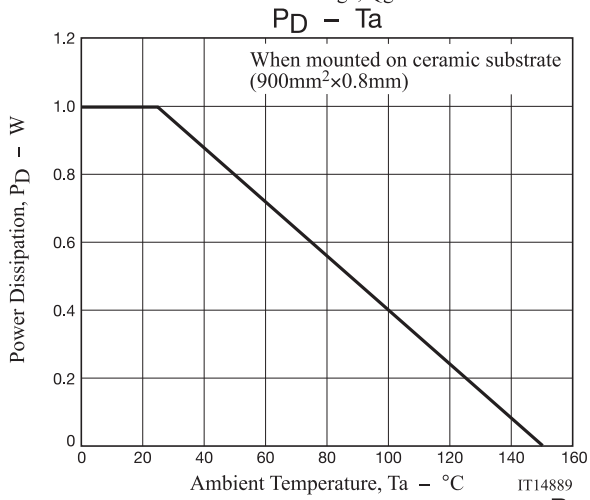
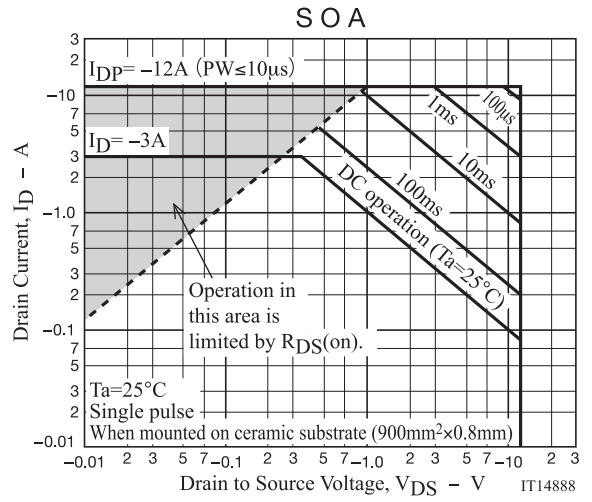
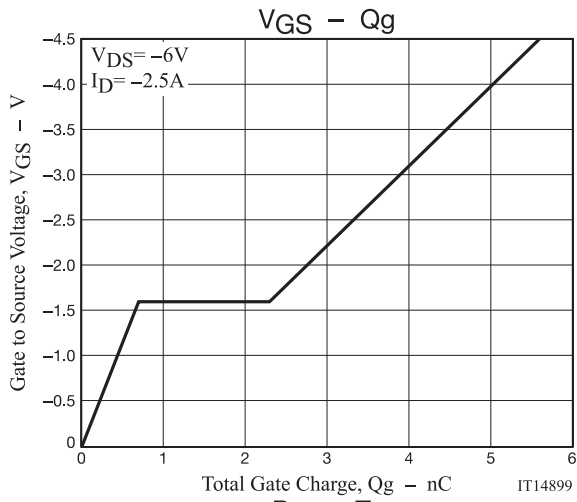
### Switching Time Test Circuit



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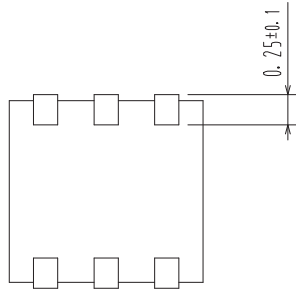
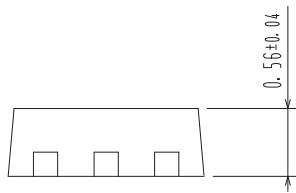
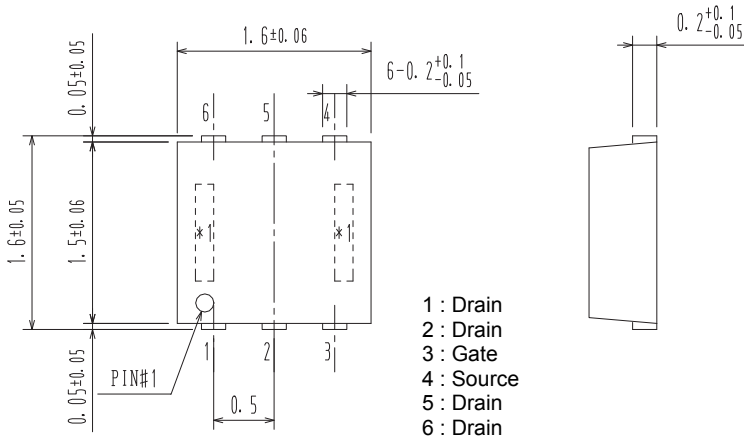


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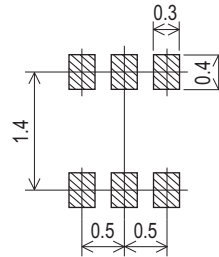
## PACKAGE DIMENSIONS

unit : mm

SOT-563 / SCH6  
CASE 463AB  
ISSUE O



### Recommended Soldering Footprint



## ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
SCH1331-TL-H	YG	SOT-563 / SCH6 (Pb-Free / Halogen Free)	5,000 / Tape & Reel
SCH1331-TL-W			

† 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. [http://www.onsemi.com/pub\\_link/Collateral/BRD8011-D.PDF](http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF)

Note on usage : Since the SCH1331 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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