SCH1332

Power MOSFET
–20V, 95mΩ, –2.5A, Single P-Channel

ON Semiconductor®

www.onsemi.com

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

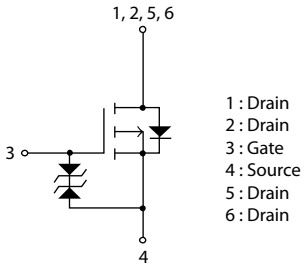
- Low On-Resistance
- High Speed Switching
- 1.8V drive
- Pb-Free, Halogen Free and RoHS compliance
- Ultra small package SCH6 (1.6mm×1.6mm×0.56mmt)

Typical Applications

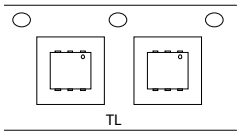
- DC/DC Converter

V_{DSS}	R_{DS}(on) Max	I_D Max
–20V	95mΩ@ –4.5V	–2.5A
	138mΩ@ –2.5V	
	215mΩ@ –1.8V	

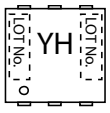
ELECTRICAL CONNECTION
P-Channel



PACKING TYPE : TL



MARKING



ORDERING INFORMATION

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

SPECIFICATIONS

ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1, 2)

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DSS}	–20	V
Gate to Source Voltage	V_{GSS}	±10	V
Drain Current (DC)	I_D	–2.5	A
Drain Current (Pulse) PW ≤ 10μs, duty cycle ≤ 1%	I_{DP}	–10	A
Power Dissipation When mounted on ceramic substrate (900mm^2 × 0.8mm)	P_D	1	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	–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

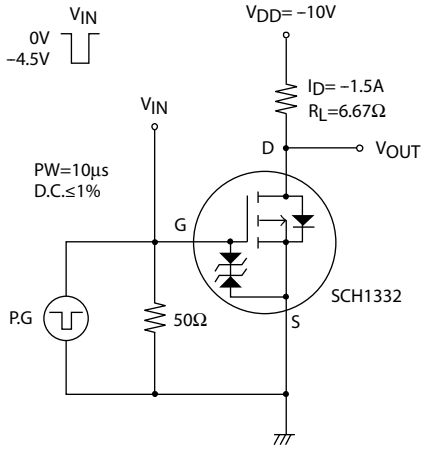
Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (900mm^2 × 0.8mm)	$R_{\theta JA}$	125	°C/W

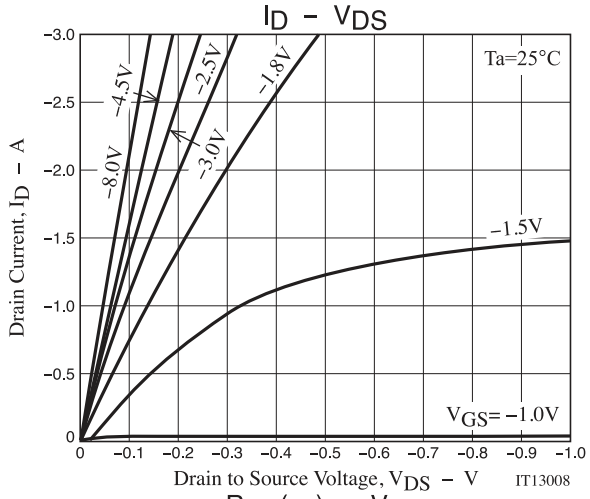
ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 3)

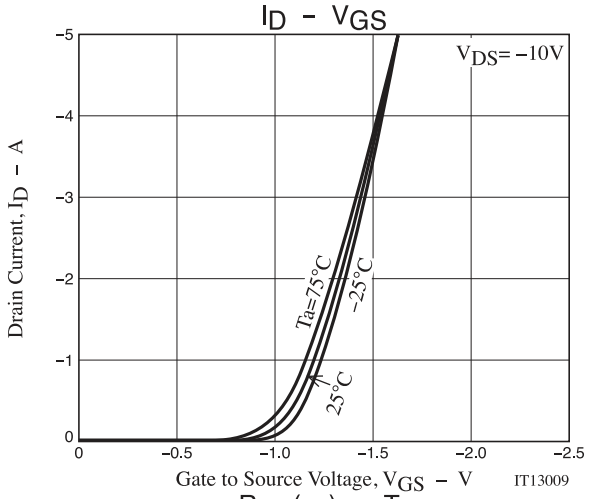
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−20V, V_{GS}=0V			−1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=−10V, I_D=−1mA	−0.4		−1.3	V
Forward Transconductance	g_{FS}	V_{DS}=−10V, I_D=−1.5A	2.2	3.8		S
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=−1.5A, V_{GS}=−4.5V		73	95	mΩ
	$R_{DS}(on)2$	I_D=−0.8A, V_{GS}=−2.5V		98	138	mΩ
	$R_{DS}(on)3$	I_D=−0.3A, V_{GS}=−1.8V		140	215	mΩ
Input Capacitance	Ciss	V_{DS}=−10V, f=1MHz		375		pF
Output Capacitance	Coss			77		pF
Reverse Transfer Capacitance	Crss			58		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		8.1		ns
Rise Time	t_r			26		ns
Turn-OFF Delay Time	$t_d(off)$			43		ns
Fall Time	t_f			37		ns
Total Gate Charge	Qg	V_{DS}=−10V, V_{GS}=−4.5V, I_D=−2.5A		4.6		nC
Gate to Source Charge	Qgs			0.8		nC
Gate to Drain “Miller” Charge	Qgd			1.3		nC
Forward Diode Voltage	V_{SD}	I_S=−2.5A, V_{GS}=0V		−0.82	−1.2	V

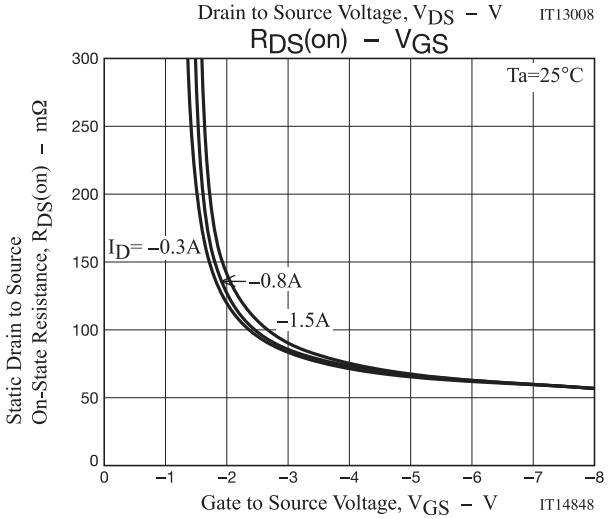
Note 3 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

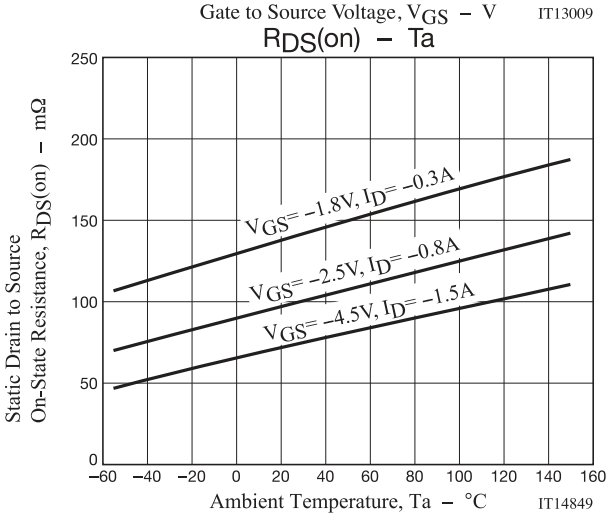
Switching Time Test Circuit

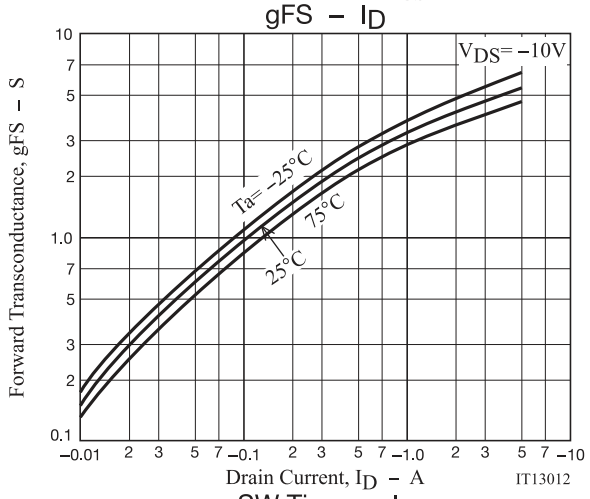


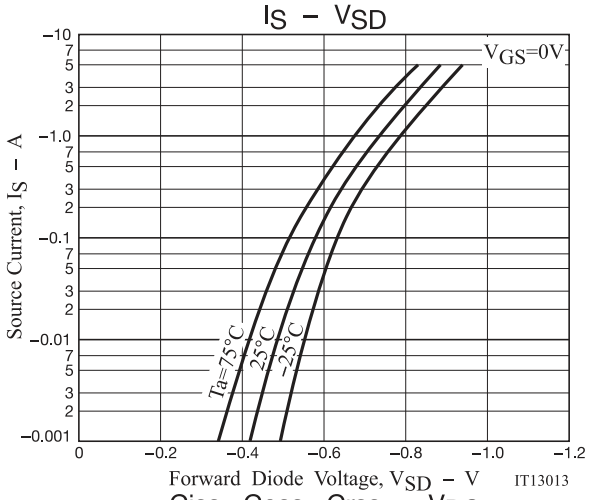

ID – VDS
Ta=25°C
–4.5V
–2.5V
–1.8V
–8.0V
–3.0V
–1.5V
VGS= –1.0V
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT13008

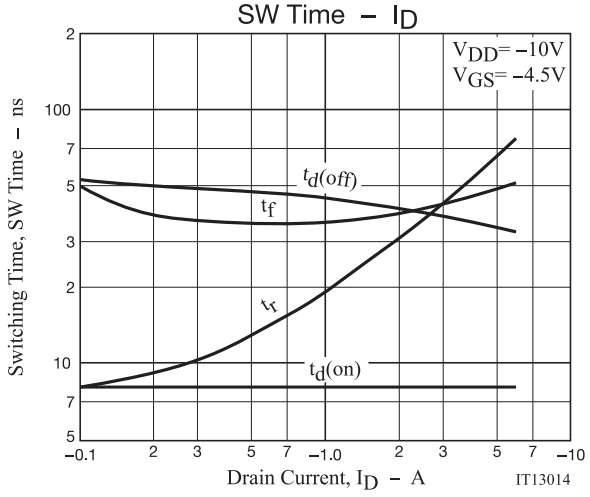

ID – VGS
VDS= –10V
Ta=75°C
–25°C
25°C
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT13009

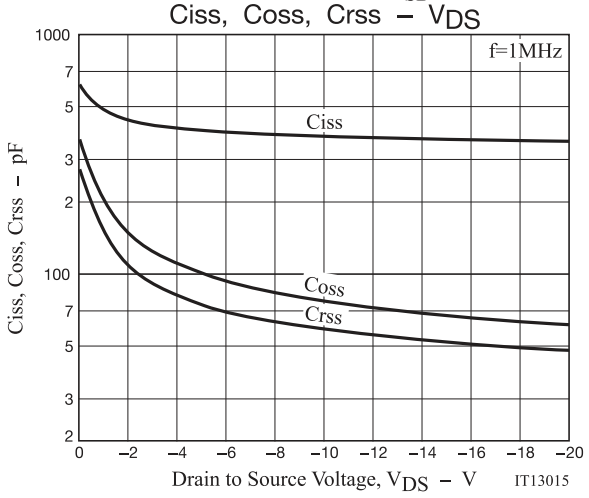

RDS(on) – VGS
Ta=25°C
ID= –0.3A
–0.8A
–1.5A
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT14848

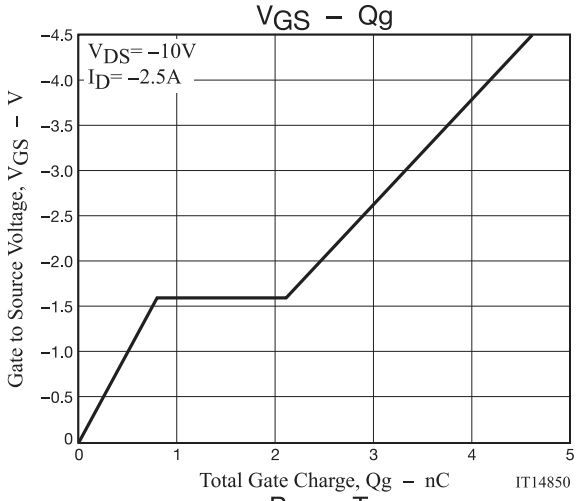

RDS(on) – Ta
VGS= –1.8V, ID= –0.3A
VGS= –2.5V, ID= –0.8A
VGS= –4.5V, ID= –1.5A
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT14849

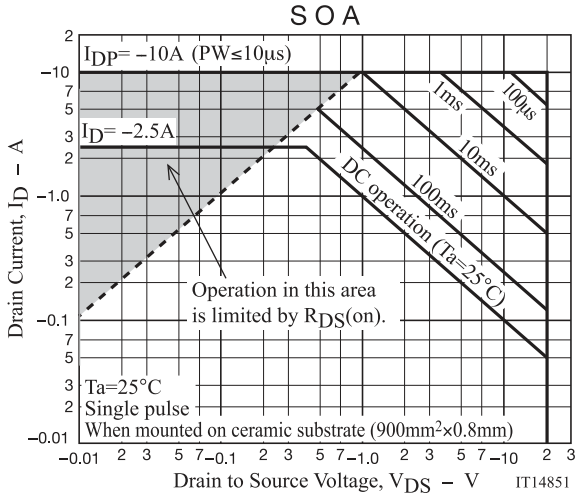

gFS – ID
VDS= –10V
Ta= –25°C
75°C
25°C
Forward Transconductance, gFS – S
Drain Current, ID – A
IT13012

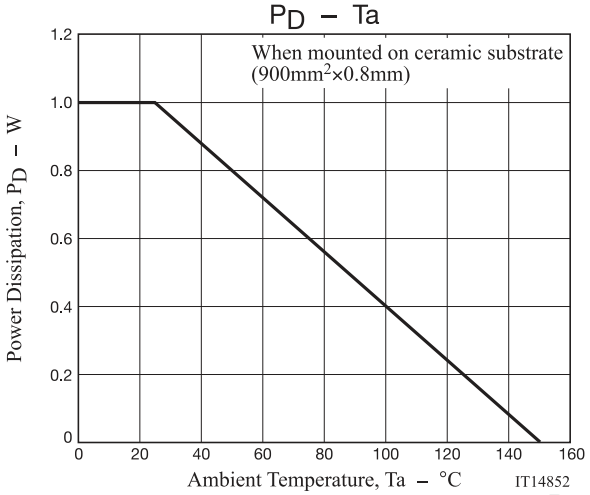

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Forward Diode Voltage, VSD – V
IT13013

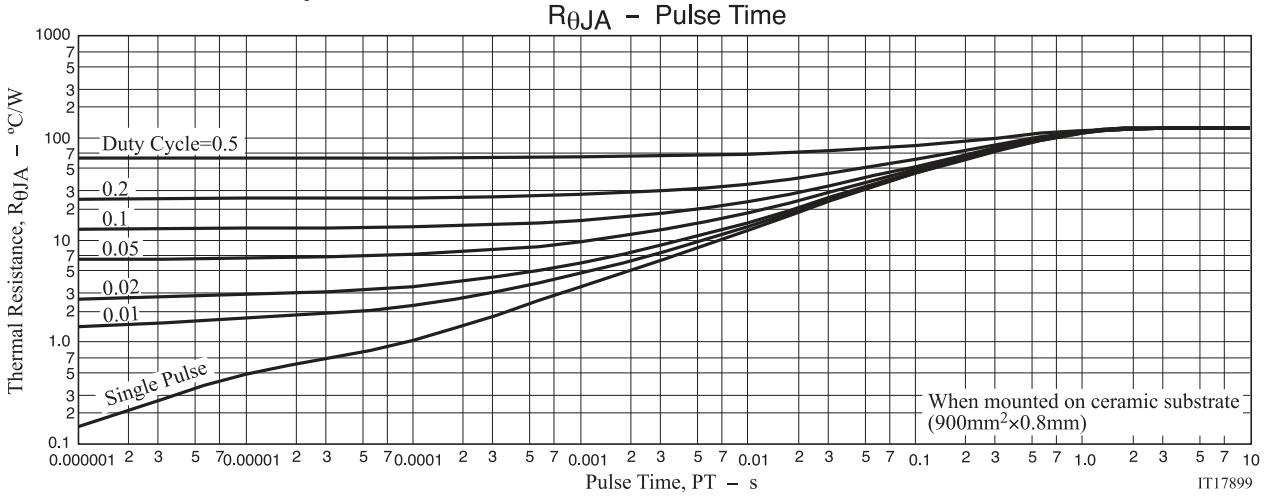

SW Time – ID
VDD= –10V
VGS= –4.5V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT13014


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT13015


VGS – Qg
VDS= –10V
ID= –2.5A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT14850


S O A
IDP= –10A (PW≤10μs)
ID= –2.5A
1ms
100μs
10ms
100ms
DC operation (Ta=25°C)
Operation in this area
is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (900mm2×0.8mm)
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT14851

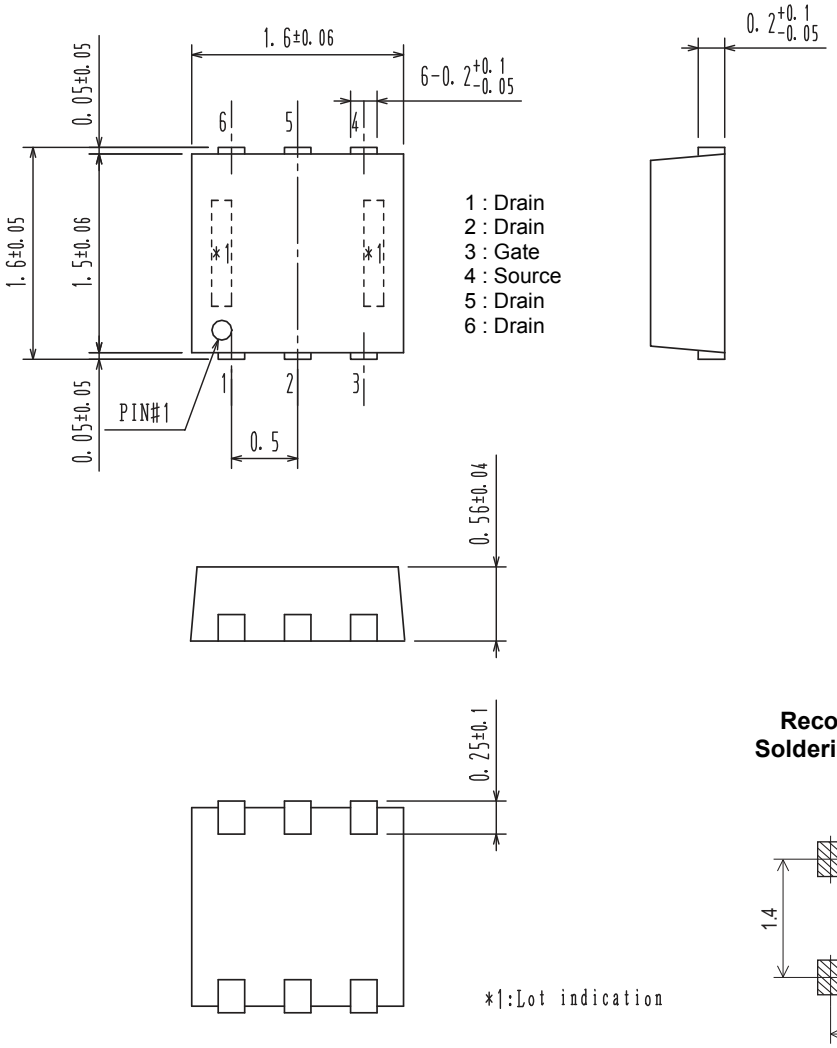

PD – Ta
When mounted on ceramic substrate
(900mm2×0.8mm)
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT14852


RθJA – Pulse Time
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
When mounted on ceramic substrate
(900mm2×0.8mm)
Thermal Resistance, RθJA – °C/W
Pulse Time, PT – s
IT17899

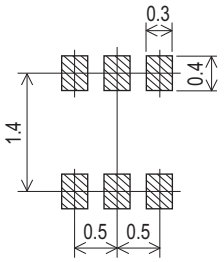
PACKAGE DIMENSIONS

unit : mm

SOT-563 / **SCH6**
CASE 463AB
ISSUE O



Recommended Soldering Footprint



ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
SCH1332-TL-H	YH	SOT-563 / SCH6 (Pb-Free / Halogen Free)	5,000 / Tape & Reel
SCH1332-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

Note on usage : Since the SCH1332 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.