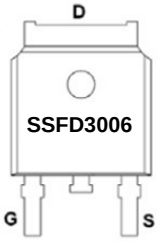
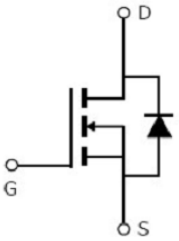
Main Product Characteristics:

V_{DSS}	30V
R_{DS}(on)	3.8mΩ (typ.)
I_D	90A

TO-252 (D-PAK)



Marking and pin Assignment



Schematic diagram

Features and Benefits:

- Advanced trench MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- High Power and current handing capability
- 175℃ operating temperature

Description:

It utilizes the advanced trench processing techniques to achieve extremely low on resistance and low gate charge. These features combine to make this design an extremely efficient and reliable device for use in PWM, load switching and a wide variety of other applications.

Absolute max Rating:

Symbol	Parameter	Max.	Units
I_D @ TC = 25°C	Continuous Drain Current, VGS @ 10V①	90	A
I_D @ TC = 100°C	Continuous Drain Current, VGS @ 10V①	66	
I_{DM}	Pulsed Drain Current②	360	
I_{SM}	Pulsed Source Current (Body Diode)②	360	
P_D @TC = 25°C	Power Dissipation③	75	W
P_D @TC =100°C	Power Dissipation③	78	W
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak diode recovery voltage	1.5	V/nS
E_{AS}	Single Pulse Avalanche Energy @ L=0.1mH	90	mJ
I_{AS}	Avalanche Current @ L=0.1mH	42	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 175	°C

Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case③	—	2	℃/W
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	—	100	℃/W
	Junction-to-Ambient (PCB mounted, steady-state) ④	—	50	℃/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

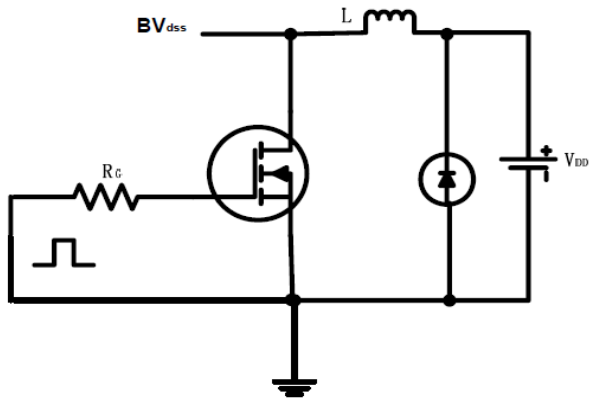
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	30	—	—	V	V_{GS} = 0V, ID = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	3.8	6	mΩ	V_{GS}=10V,I_D = 15A
		—	6.4	—		T_J = 125℃
		—	4.9	8.5		V_{GS}=4.5V,I_D =11.5A
		—	7.2	—		T_J = 125℃
$V_{GS(th)}$	Gate threshold voltage	1	1.5	3	V	V_{DS} = V_{GS}, I_D = 250μA
		—	1.21	—		T_J = 125℃
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} = 30V,V_{GS} = 0V
		—	—	50		T_J = 125°C
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		-100	—	—		V_{GS} = -20V
Q_g	Total gate charge	—	35	—	nC	I_D = 32A, V_{DS}=15V, V_{GS} =4.5V
Q_{gs}	Gate-to-Source charge	—	8	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	18	—		
$t_{d(on)}$	Turn-on delay time	—	12	—	ns	V_{GS}=4.5V, VDS=15V, R_{GEN}=2Ω， I_D = 32A,
t_r	Rise time	—	63	—		
$t_{d(off)}$	Turn-Off delay time	—	41	—		
t_f	Fall time	—	11	—		
C_{iss}	Input capacitance	—	3833	—	pF	V_{GS} = 0V V_{DS} = 15V f = 800kHz
C_{oss}	Output capacitance	—	459	—		
C_{rss}	Reverse transfer capacitance	—	427	—		

Source-Drain Ratings and Characteristics

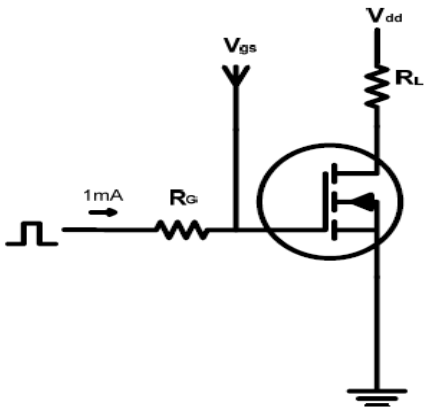
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Maximum Body-Diode Continuous Curren	—	—	90	A	
V_{SD}	Diode Forward Voltage	—	0.72	1.2	V	I_S=2.8A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	16	—	ns	T_J = 25°C, I_F =30A, di/dt = 150A/μs
Q_{rr}	Reverse Recovery Charge	—	8.8	—	nC	

Test circuits and Waveforms

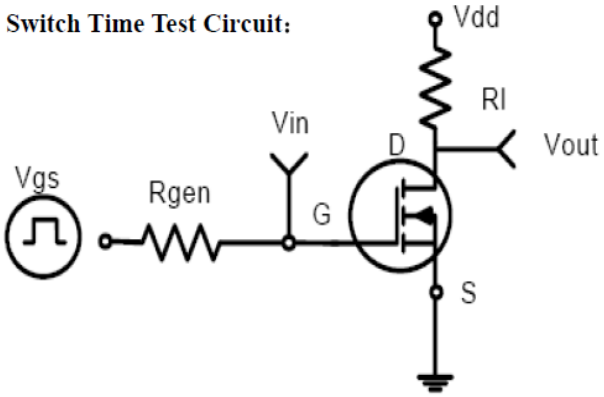
EAS test circuits:



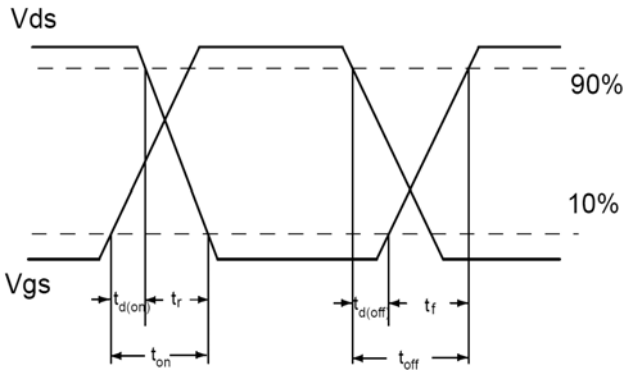
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



Notes:

①The maximum current rating is limited by bond-wires.

②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

④The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C

⑤These curves are based on the junction-to-case thermal impedence which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=175°C.

Typical electrical and thermal characteristics

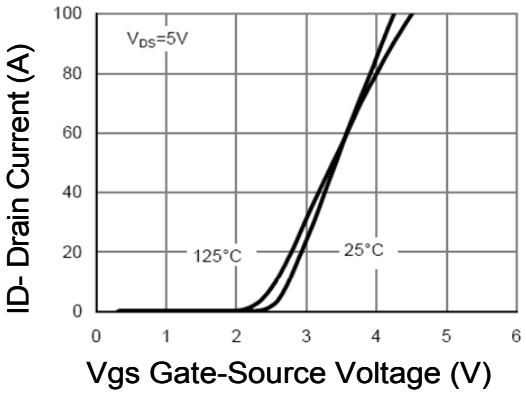


Figure 1: Typical Transfer Characteristics

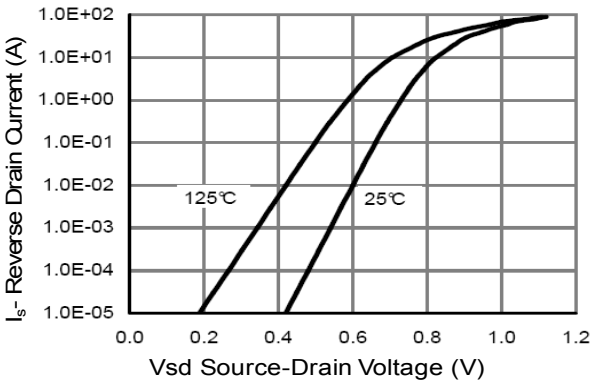


Figure 6: Body-Diode Characteristics

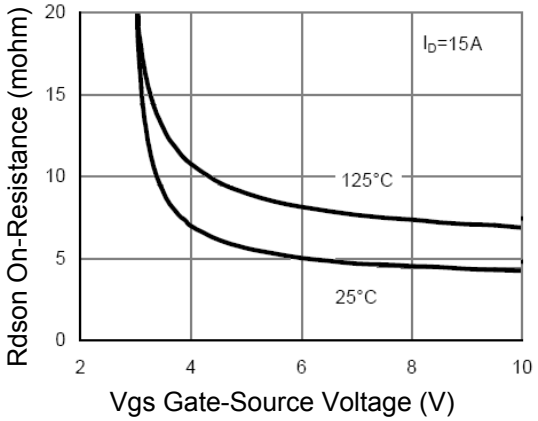


Figure 5: On-Resistance vs. Gate-Source Voltage

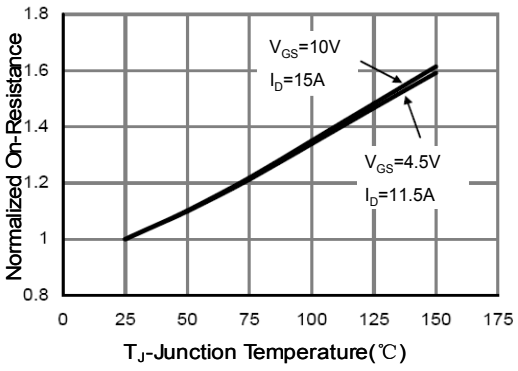


Figure 4: On-Resistance vs. Junction Temperature

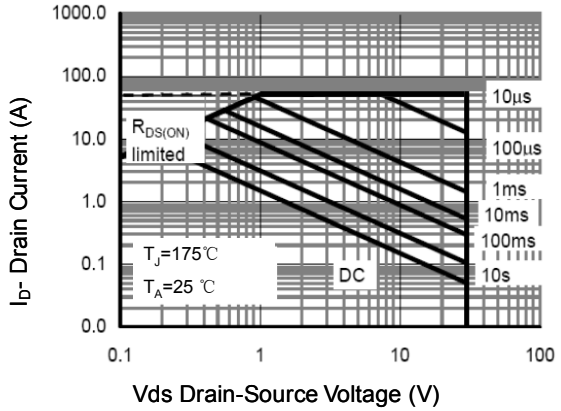


Figure 5: Maximum Forward Biased Safe Operating Area⑤

Typical electrical and thermal characteristics

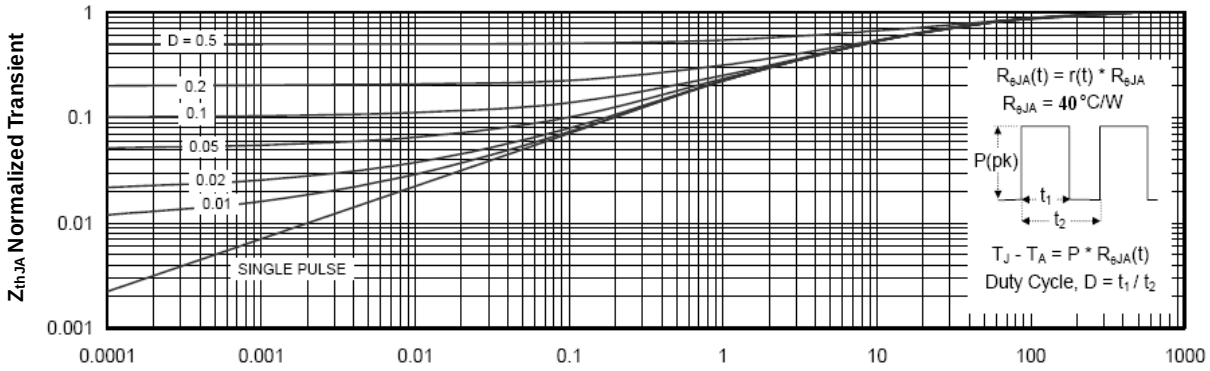
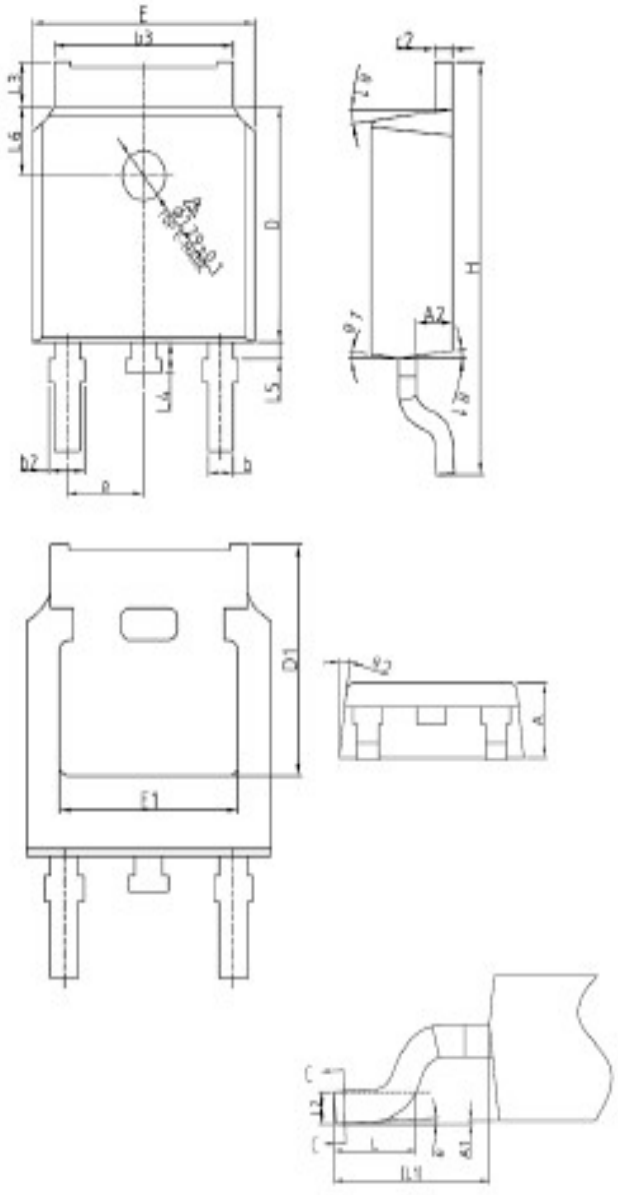


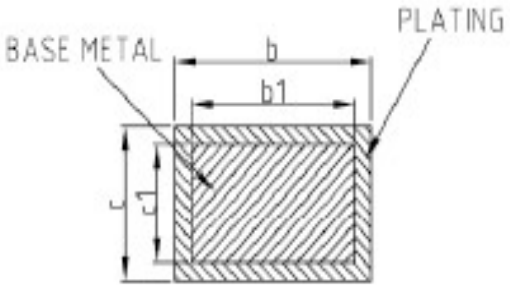
Figure 6: Normalized Maximum Transient Thermal Impedance⑥

TO-252E-2-M PACKAGE INFORMATION



Dimensions in Millimeters

SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0	–	0.10
A2	0.90	1.01	1.10
b	0.72	–	0.85
b1	0.71	0.76	0.81
b2	0.72	–	0.90
b3	5.13	5.33	5.46
c	0.47	–	0.60
c1	0.46	0.51	0.56
c2	0.47	–	0.60
D	6.00	6.10	6.20
D1	5.25	–	–
E	6.50	6.60	6.70
E1	4.70	–	–
e	2.186	2.286	2.386
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1	2.90REF		
L2	0.51BSC		
L3	0.90	–	1.25
L4	0.60	0.80	1.00
L5	0.15	–	0.75
L6	1.80REF		
θ	0°	–	8°
θ1	5°	7°	9°
θ2	5°	7°	9°



Ordering and Marking Information

Device Marking: SSFD3006

Package (Available)
TO-252
Operating Temperature Range
C : -55 to 175 ºC

Devices per Unit

Option1：

Package Type	Units/ Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
TO-252	80	50	4000	10	40000

Option2：

Package Type	Units/ Tape	Tapes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
TO-252	2500	2	5000	7	35000

Option3：

Package Type	Units/ Tape	Tapes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
TO-252	2500	1	2500	10	25000

ATTENTION:

- Any and all Silikron products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your Silikron representative nearest you before using any Silikron products described or contained herein in such applications.
- Silikron assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all Silikron products described or contained herein.
- Specifications of any and all Silikron products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- Silikron Semiconductor CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all Silikron products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of Silikron Semiconductor CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. Silikron believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the Silikron product that you intend to use.
- This catalog provides information as of Dec, 2008. Specifications and information herein are subject to change without notice.

Customer Service

Worldwide Sales and Service:

Sales@silikron.com

Technical Support:

Technical@silikron.com

Suzhou Silikron Semiconductor Corp.

Building 11A Suchun Industrial Square, 428# Xinglong Street, Suzhou P.R. China

TEL: (86-512) 62560688

FAX: (86-512) 65160705

E-mail: Sales@silikron.com