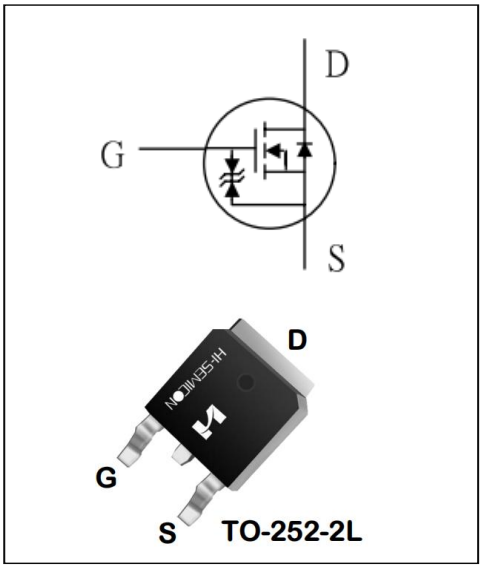
30A, 20V N-CHANNEL MOSFET

GENERAL DESCRIPTION

The SFD2003T uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.



FEATURES

- 30A,20V,$R_{DS(on)(typ.)}$=8.8mΩ@V_{GS}=4.5V
- Excellent package for good heat dissipation
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- High density cell design for ultra low Rdson
- Special process technology for high ESD capability
- Exceptional on-resistance and maximum DC currentcapability

ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SFD2003T	TO-252-2L	SFD2003T	Pb free	Reel

ABSOLUTE MAXIMUM RATINGS TC = 25℃ unless otherwise noted

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±12	V
Drain Current	T_C = 25°C	I_D	30	A
	T_C = 70°C		20	
Drain Current Pulsed (Note 1)		I_{DM}	78	A
Maximum Power Dissipation		PD	40	W
Operation Junction Temperature Range		T_J	-55～+150	°C
Storage Temperature Range		T_{stg}	-55～+150	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
RθJC	Thermal Resistance, Junction-to-Case	2.4	℃/W

Electrical Characteristics TC = 25℃ unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA,	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =20V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current, Forward	V_{GS} = ±12V, V_{DS} = 0V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 1mA	0.5	0.7	0.9	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 2.5V, I_D = 30A	-	8.8	11.5	mΩ
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 4.5V, I_D = 10A	-	10.8	14.0	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =15V, V_{GS} = 0V, f =1.0MHz	-	915	-	pF
C_{oss}	Output Capacitance		-	160	-	pF
C_{rss}	Reverse Transfer Capacitance		-	100	-	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 15V, I_D=15A, V_{GS}= 10V RGEN =3.3Ω	-	5	-	ns
t_r	Turn-On Rise Time		-	8.9	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	18.2	-	ns
t_f	Turn-Off Fall Time		-	3.2	-	ns
Q_g	Total Gate Charge	V_{DS} = 10V, I_D =20.0A, V_{GS} =4.5V	-	15	-	nC
Q_{gs}	Gate-Source Charge		-	1.9	-	nC
Q_{gd}	Gate-Drain Charge		-	3.0	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		-	-	30	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_S = 2.5A	-	-	1.2	V

Notes:

1.Pulse width limited by maximum junction temperature;
2.Pulse test
3.Surface mounted on 1in² 2oz copper pad of FR4 board ,t<10sec; 135℃/W when mounted on min.copper pad.
4.Maximum current limited by package.

Typical Electrical and Thermal Characteristics (Curves)

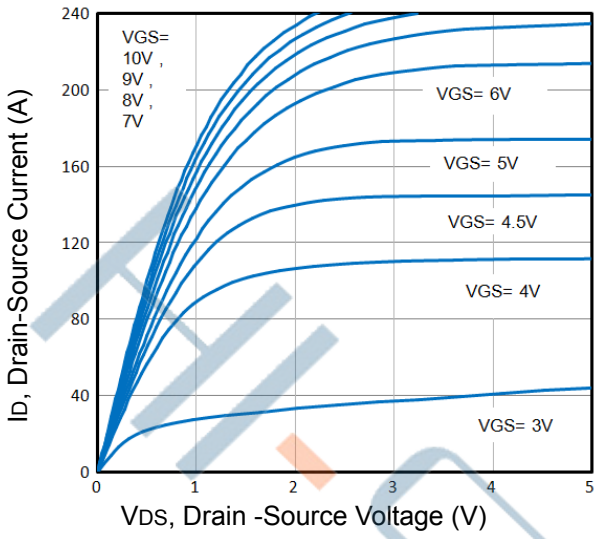


Fig1. Typical Output Characteristics

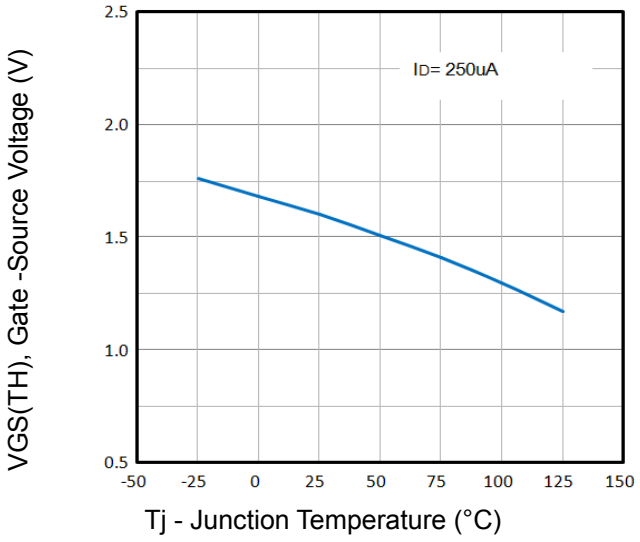


Fig2. VGS(TH) Voltage Vs. Temperature

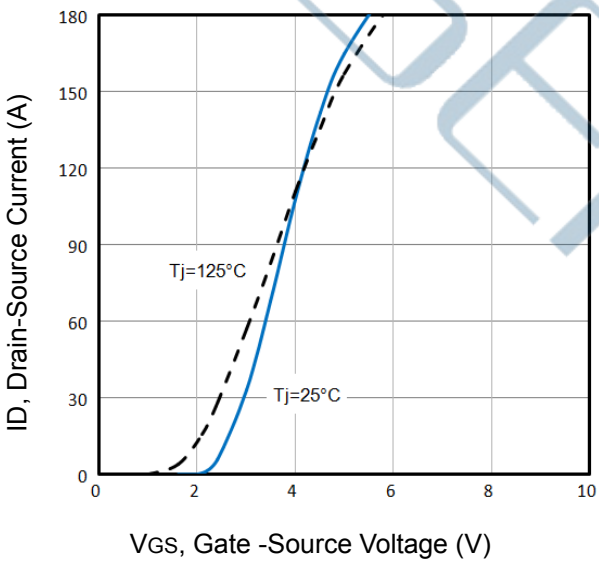


Fig3. Typical Transfer Characteristics

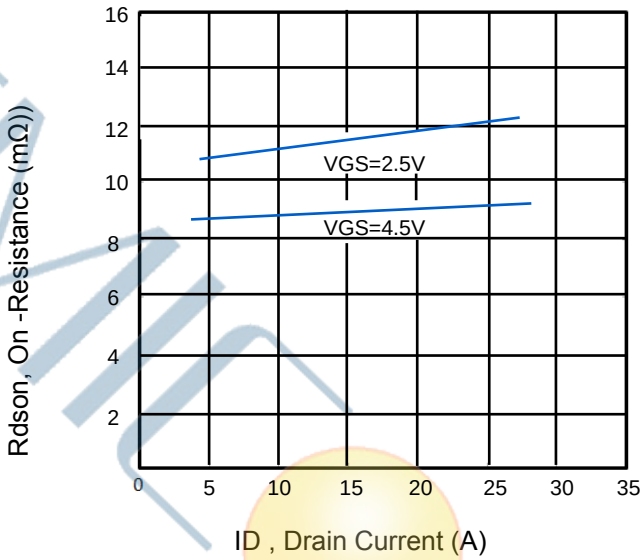


Fig4. On-Resistance vs. Drain Current and Gate Voltage

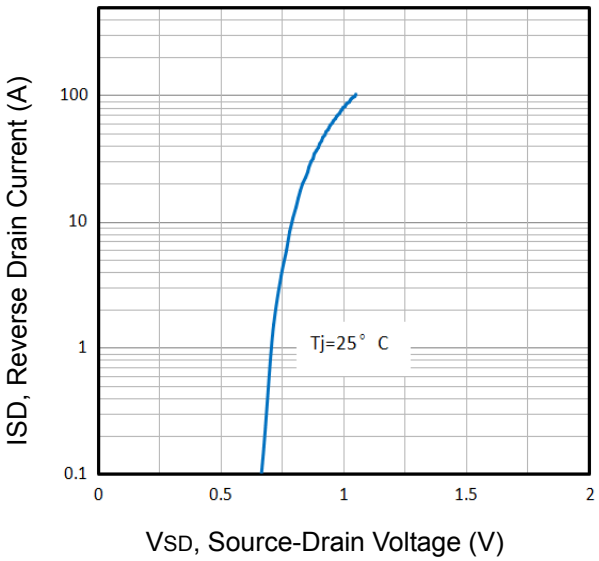


Fig5. Typical Source-Drain Diode Forward Voltage

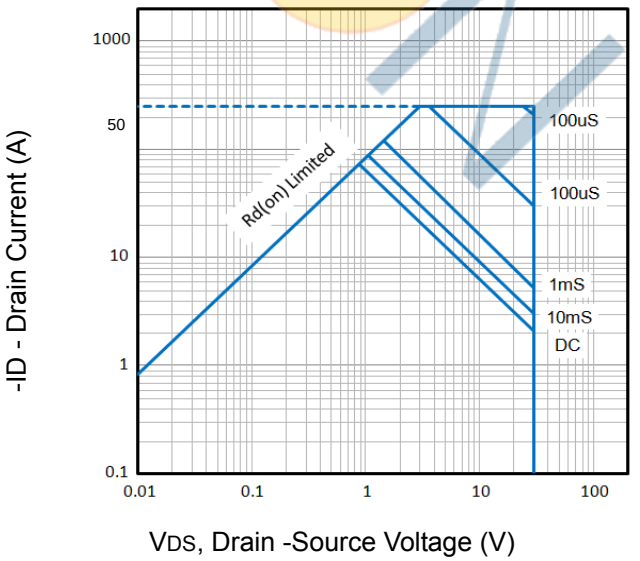


Fig6. Maximum Safe Operating Area

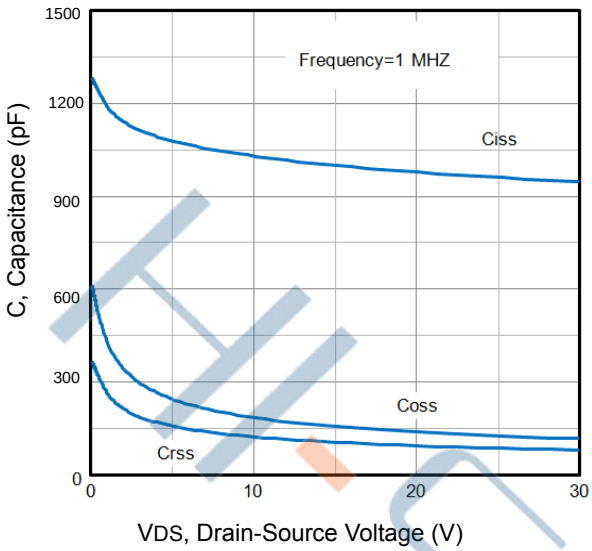


Fig7. Typical Capacitance Vs. Drain-Source Voltage

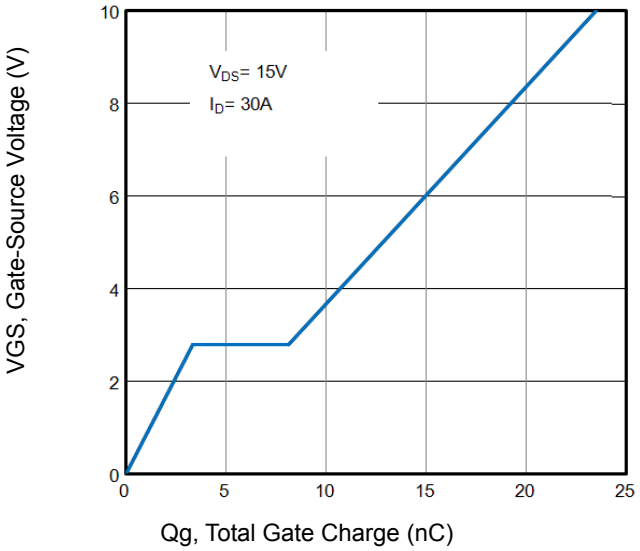


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

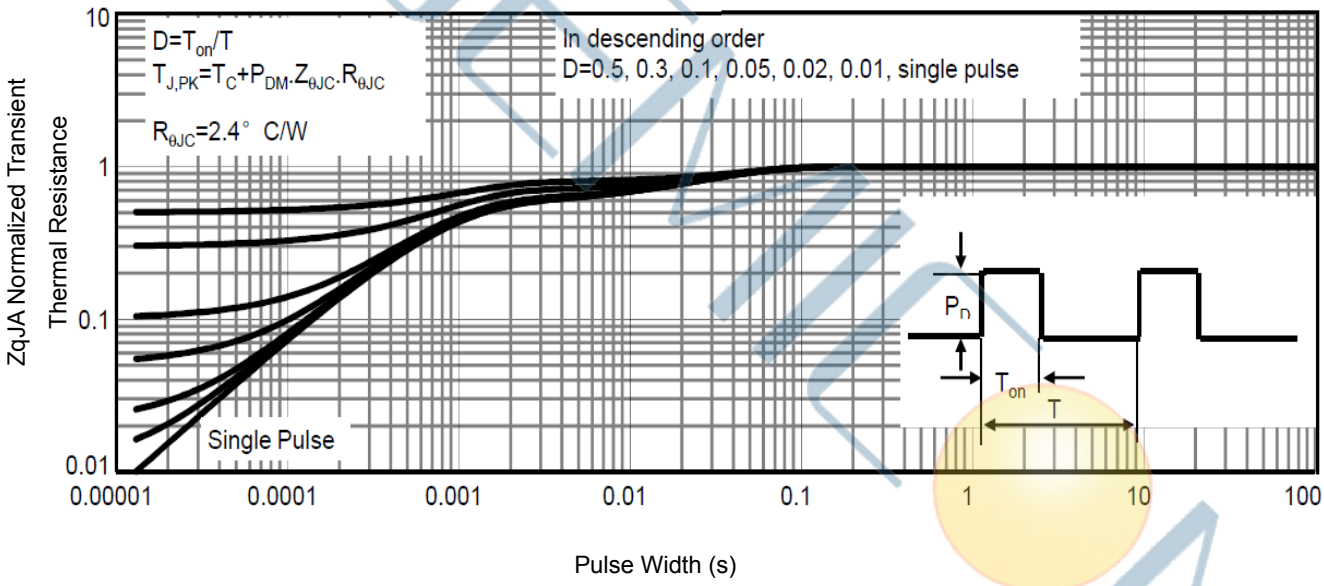
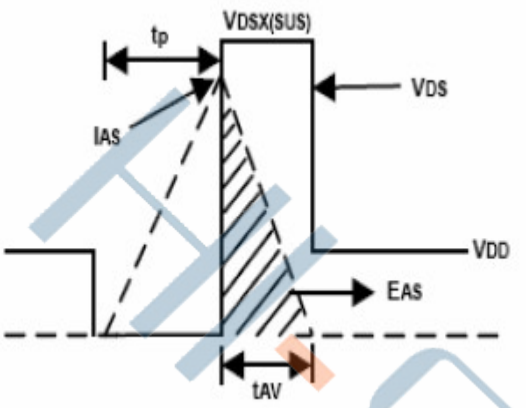
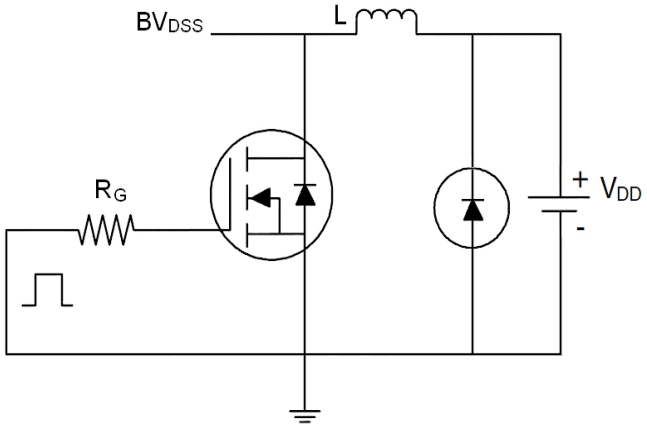


Fig9. Normalized Maximum Transient Thermal Impedance

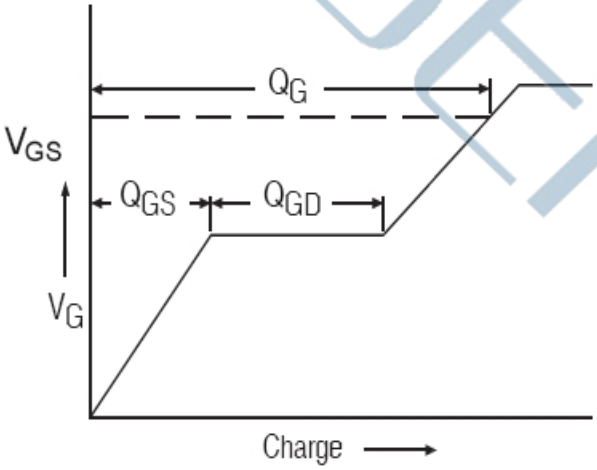
TYPICAL TEST CIRCURT

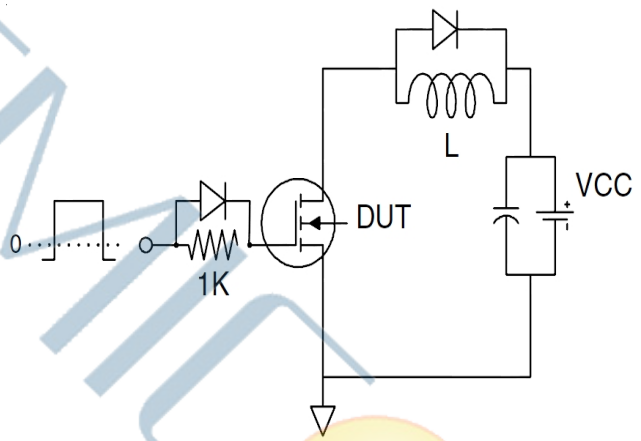
1）E_{AS} Test Circuits



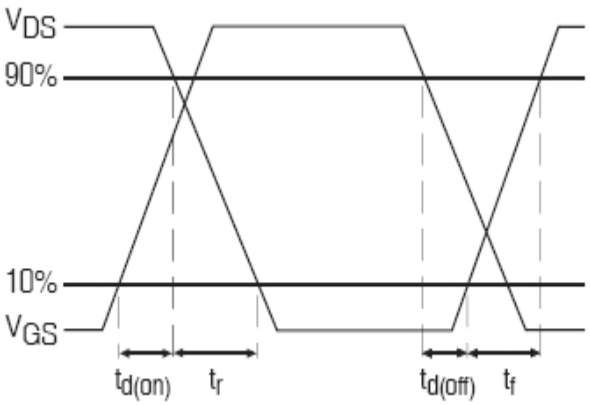


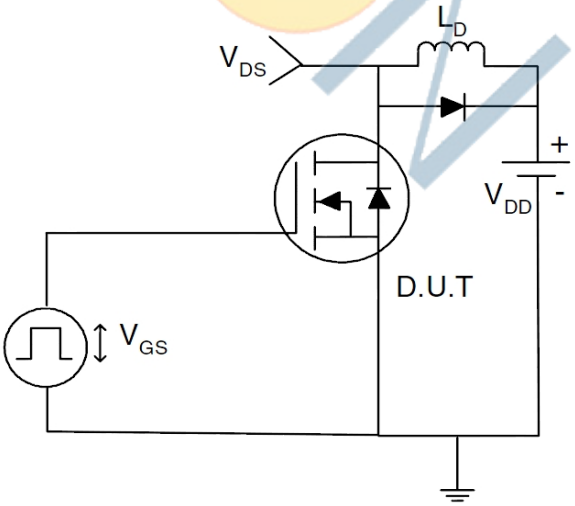
2）Gate Charge Test Circuit:





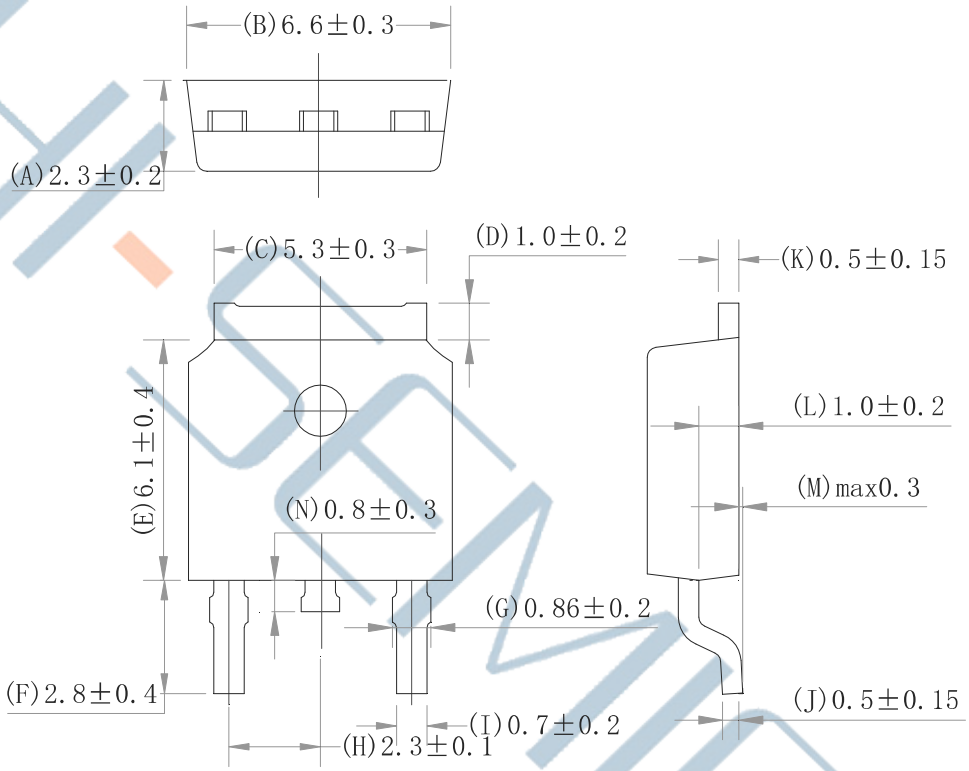
3）Switch Time Test Circuit:





Package Dimensions of TO-252-2L

Unit:mm



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