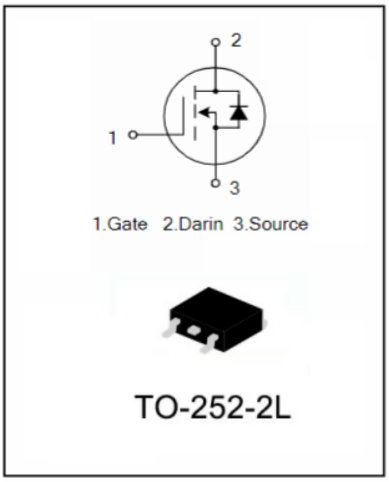
100A, 30V N-CHANNEL MOSFET

GENERAL DESCRIPTION

The SFD3010T 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

- 100A,30V,$R_{DS(on)(typ.)}$=4mΩ@V_{GS}=10V
- 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
SFD3010T	TO-252-2L	SFD3010T	Pb free	Reel

ABSOLUTE MAXIMUM RATINGS TC = 25℃ unless otherwise noted

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current	T_C = 25°C	I_D	100	A
	T_C = 100°C		63	
Drain Current Pulsed (Note 1)		I_{DM}	400	A
Maximum Power Dissipation		PD	83	W
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	200	mJ
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	1.52	℃/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,	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current, Forward	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.0	-	3.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10V, I_D = 20A	-	4.0	5.5	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f =1.0MHz	-	2190	-	pF
C_{oss}	Output Capacitance		-	268	-	pF
C_{rss}	Reverse Transfer Capacitance		-	206	-	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 20V, I_D=60A,V_{GS}= 4.5V RGEN =1.8Ω	-	12	-	ns
t_r	Turn-On Rise Time		-	88	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	140	-	ns
t_f	Turn-Off Fall Time		-	83	-	ns
Q_g	Total Gate Charge	V_{DS} = 24V, I_D =30.0A, V_{GS} =10V	-	47	-	nC
Q_{gs}	Gate-Source Charge		-	8.5	-	nC
Q_{gd}	Gate-Drain Charge		-	9.9	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		-	-	100	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_S = 20.0A	-	-	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V, I_S = 30A, dI_F/dt=100A/μs	-	16	-	ns
Q_{rr}	Reverse Recovery Charge		-	6.9	-	μC

Notes:

1.L=0.5mH,VG=10V,VDD=15V, RG=25Ω, starting temperature TJ=25°C;
2. Pulse Test: Pulse width ≤300μs,Duty cycle≤2%;
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristics (Curves)

Figure 1. On-Region Characteristics

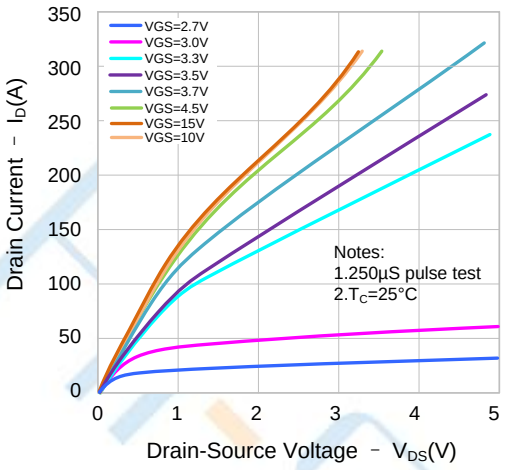


Figure 2. Transfer Characteristics

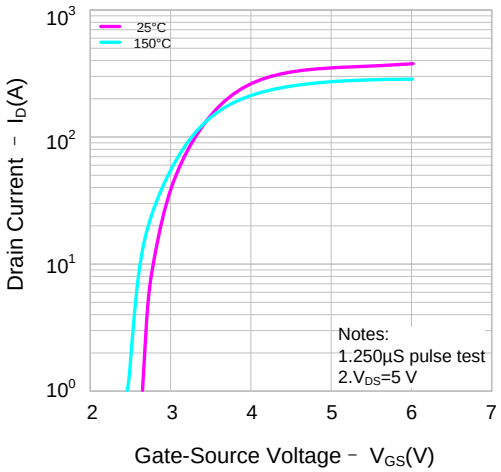


Figure 3. On-Resitance Variation vs. Drain Current

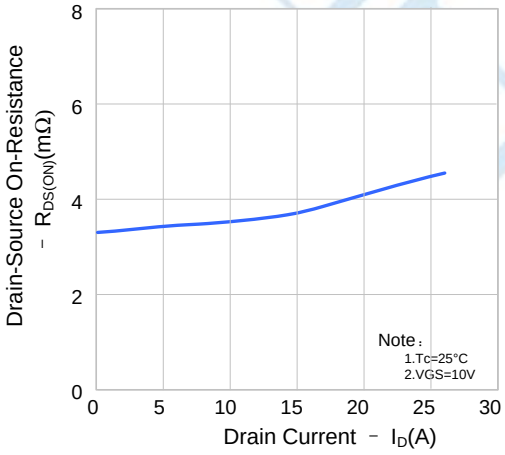


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

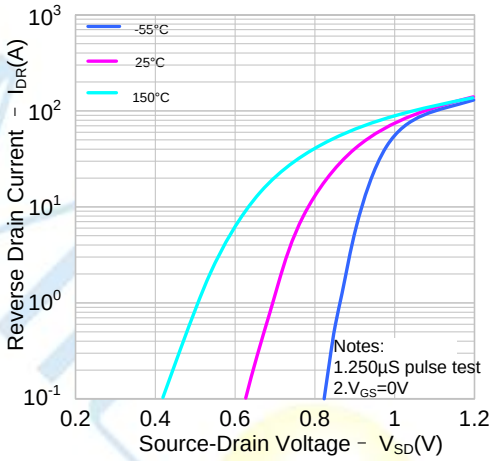


Figure 5. Capacitance Characteristics

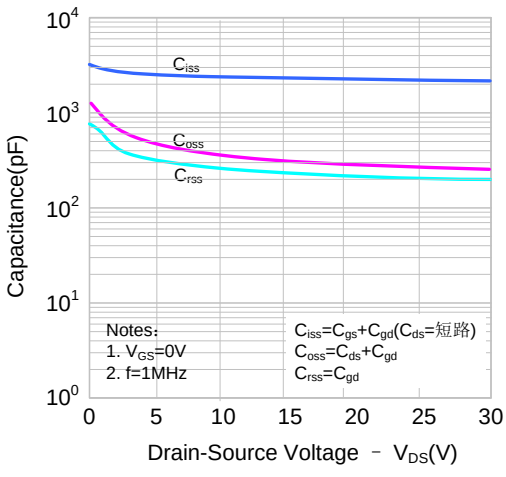


Figure 6. Gate Charge Characteristics

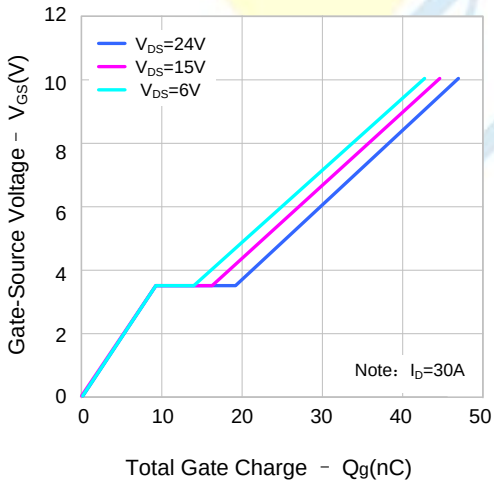


Figure 7. Breakdown Voltage Variation vs Temperature

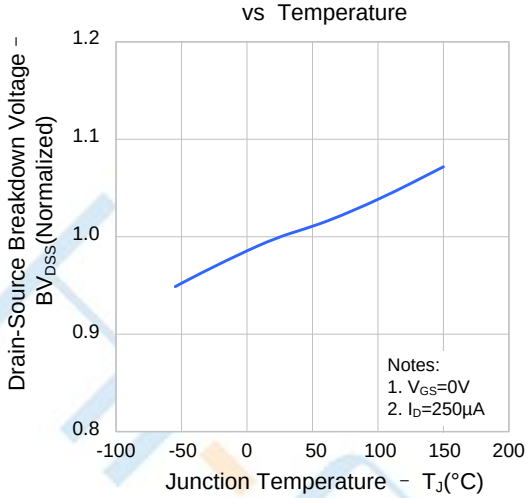


Figure 8. On-resistance Variation vs Temperature

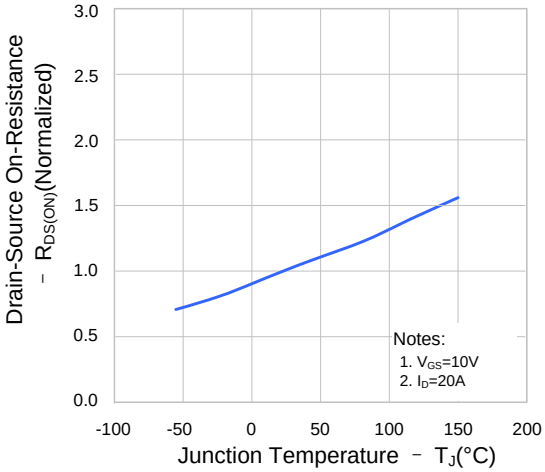
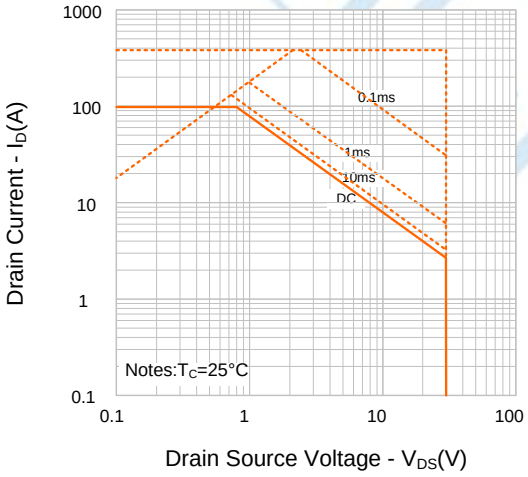
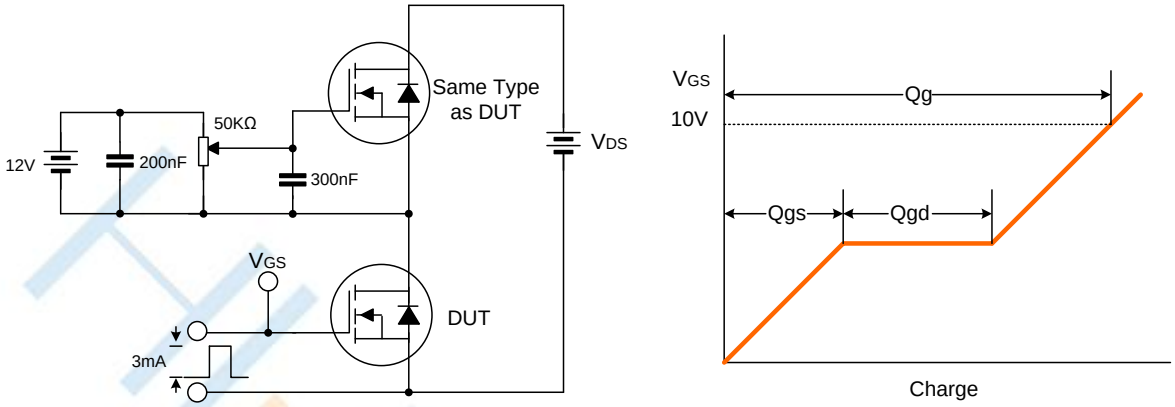


Figure 9. Max. Safe Operating Area

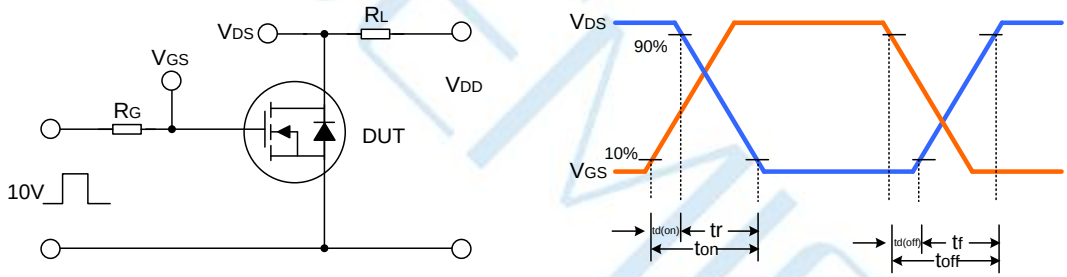


Test circuits

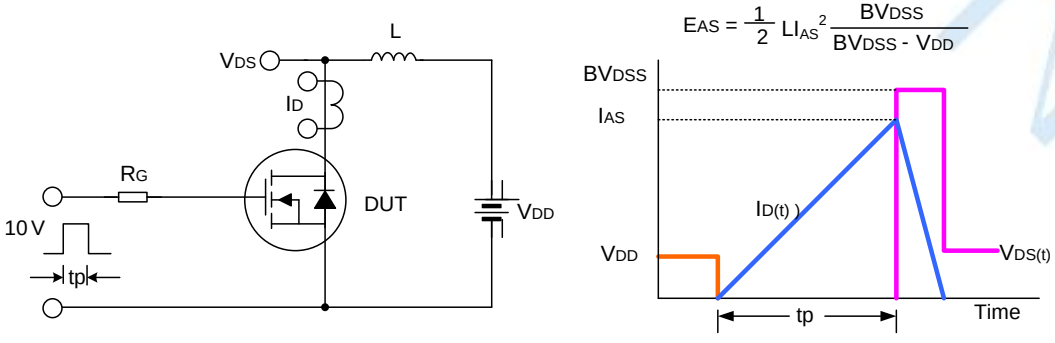
Gate Charge Test Circuit & Waveform



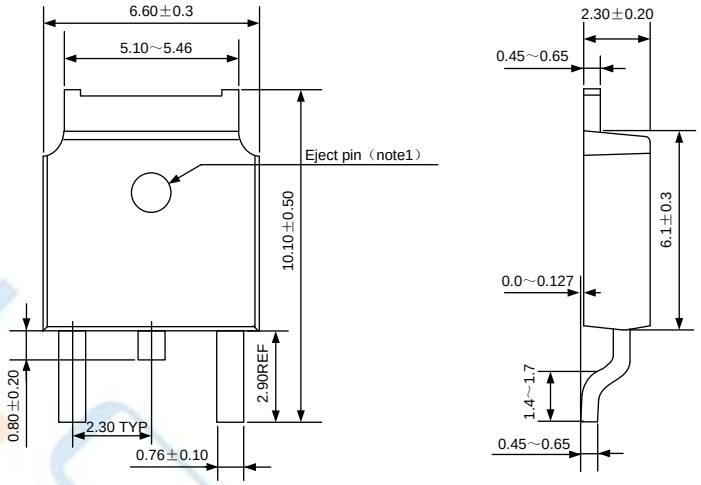
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



TO-252-2L UNIT: mm



NOTE1 There are two conditions for this position:has an eject pin or has no eject pin.