

Description

The SX30N02D uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 20V$ $I_D = 30A$

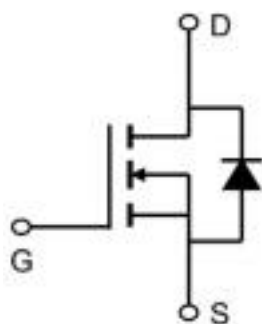
$R_{DS(ON)} = 11m\Omega @ V_{GS}=4.5V$

Application

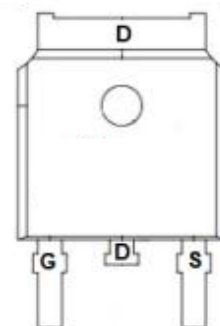
solar road lights

Load switch

Uninterruptible power supply



TO-252-3L



Absolute Maximum Ratings ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_c=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	30	A
$I_D @ T_c=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	13	A
$I_D @ T_A=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	6.3	A
$I_D @ T_A=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	5.8	A
I_{DM}	Pulsed Drain Current ²	50	A
EAS	Single Pulse Avalanche Energy ³	8.1	mJ
I_{AS}	Avalanche Current	12.7	A
$P_D @ T_c=25^\circ\text{C}$	Total Power Dissipation ⁴	20.8	W
$P_D @ T_A=25^\circ\text{C}$	Total Power Dissipation ⁴	2	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	6	$^\circ\text{C/W}$

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20	22		V
ΔBVDSS/ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.018	---	V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.50	0.65	1.0	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =7.6A		11	15	mΩ
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =2.5V, I _D =3.5A		15.5	20	
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =1.8V, I _D =2.5A		20.5	35	
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V			1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±10V, V _{DS} =0V			±100	nA
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHZ		888		pF
C _{oss}	Output Capacitance			133		
C _{rss}	Reverse Transfer Capacitance			117		
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =10V, I _D =6.8A		11.05		nC
Q _{gs}	Gate-Source Charge			1.73		
Q _{gd}	Gate-Drain Charge			3.1		
t _{D(on)}	Turn-on Delay Time	V _{GS} =4.5V, V _{DS} =10V, I _D =6.8A R _{GEN} =3Ω		7		ns
t _r	Turn-on Rise Time			46		
t _{D(off)}	Turn-off Delay Time			30		
t _f	Turn-off fall Time			52		
V _{SD}	Diode Forward Voltage	I _S =7.6A, V _{GS} =0V			1.2	V

Note :

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、The power dissipation is limited by 150°C junction temperature
- 4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

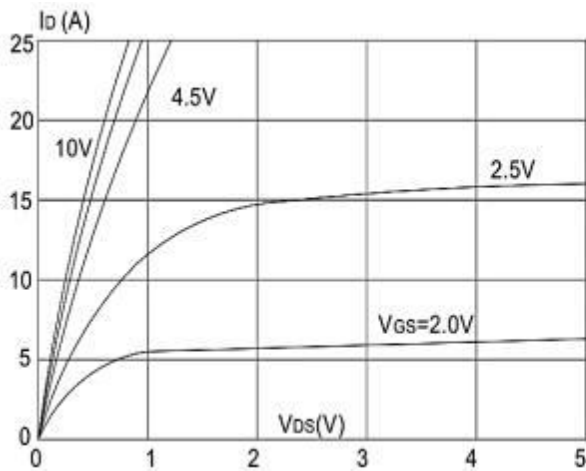


Figure1: Output Characteristics

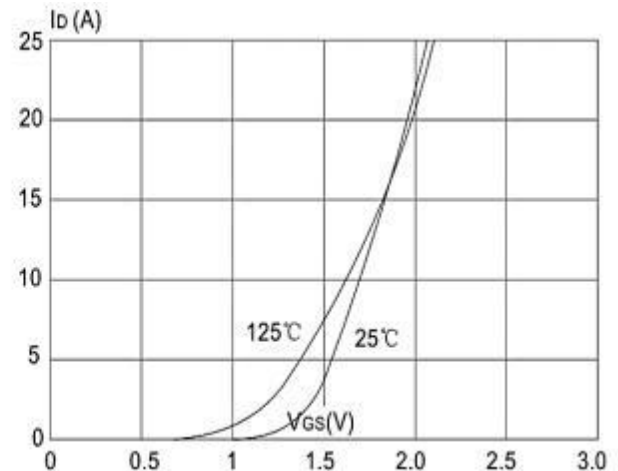


Figure 2: Typical Transfer Characteristics

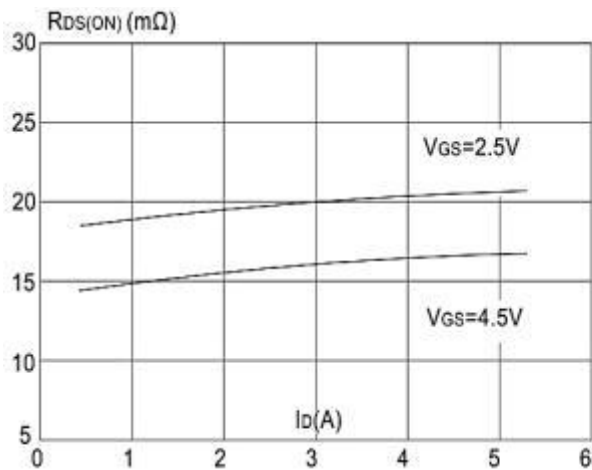


Figure 3: On-resistance vs. Drain Current

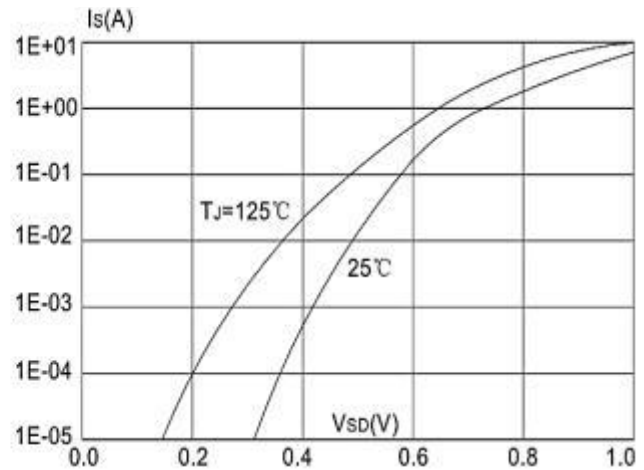


Figure 4: Body Diode Characteristics

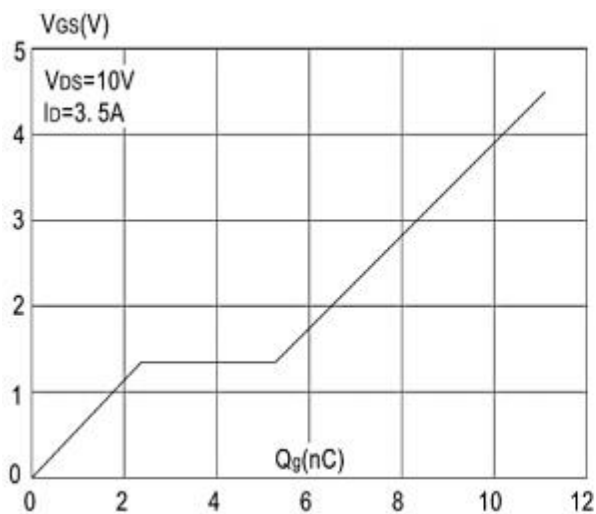


Figure 5: Gate Charge Characteristics

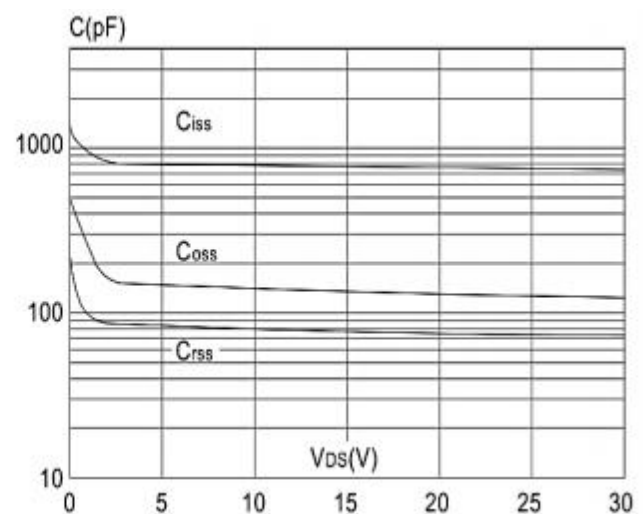


Figure 6: Capacitance Characteristics

Typical Characteristics

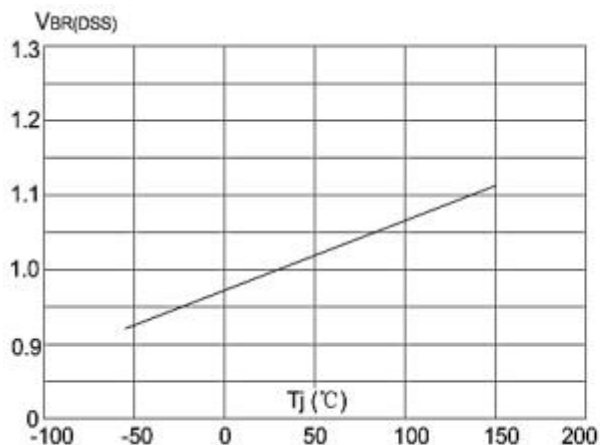


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

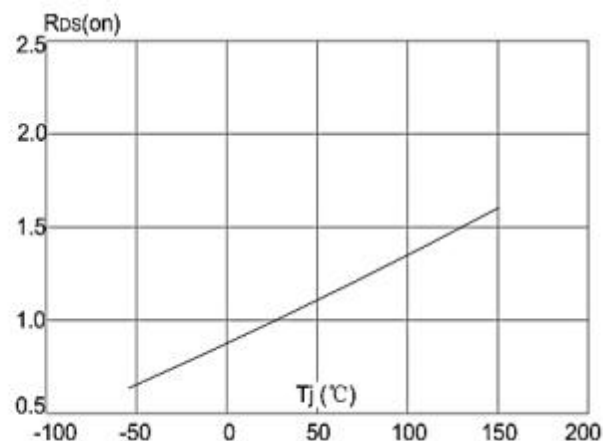


Figure 8: Normalized on Resistance vs. Junction Temperature

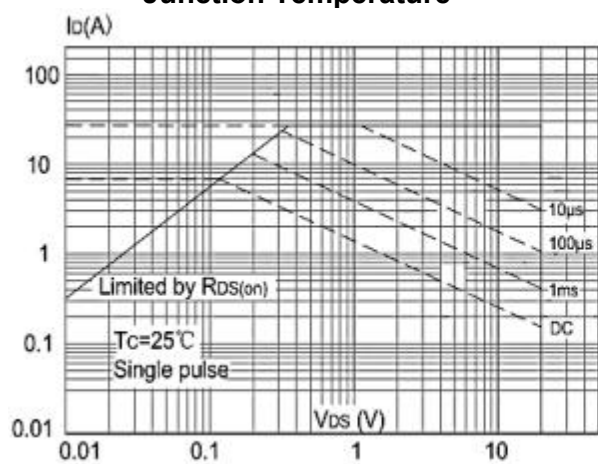


Figure 9: Maximum Safe Operating Area vs. Case Temperature

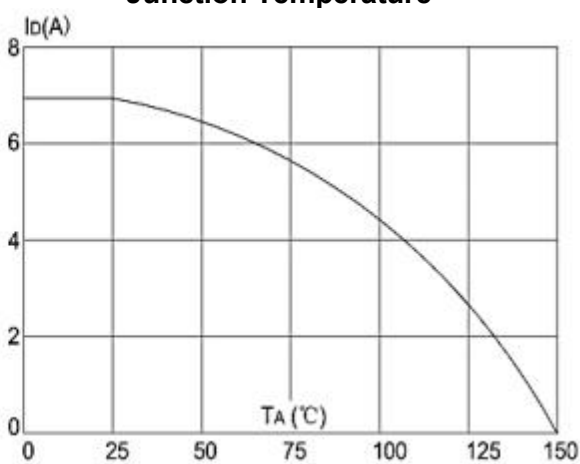


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

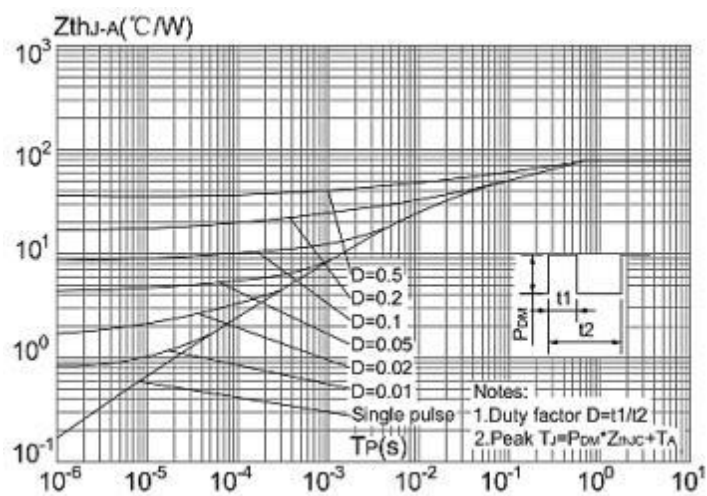
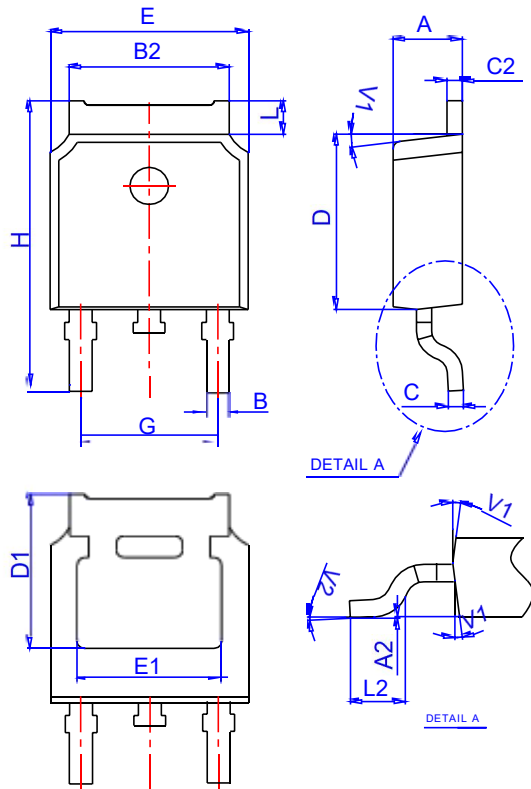


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Mechanical Data: TO-252-3L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-252-3L		2500