

Description

The SX10P10D uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = -100V$ $I_D = -10A$

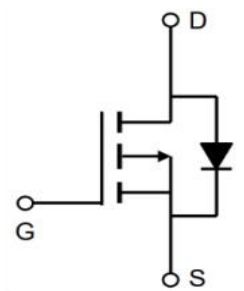
$R_{DS(ON)} < 280m\Omega$ @ $V_{GS} = 10V$

Application

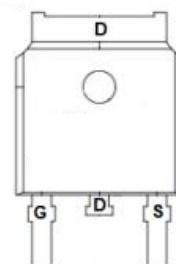
Brushless motor

Load switch

Uninterruptible power supply



TO-252-3L



Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-10	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-6.7	A
I_{DM}	Pulsed Drain Current ²	-50	A
EAS	Single Pulse Avalanche Energy ³	87.2	mJ
I_{AS}	Avalanche Current	-7	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ⁴	4.5	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62.5	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	6.45	$^\circ C/W$

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

Symbol	Parameter	Test Condition	Min.	Typ	Max.	Units
BVDSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-100	117	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} = -100V, V _{GS} = 0V	-	-	1	μA
IGSS	Gate to Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1.2	-1.85	-2.5	V
RDS(on)	Static Drain-Source On-Resistance ^{note1}	V _{GS} = -10V, I _D = -5A	-	235	280	mΩ
		V _{GS} = -4.5V, I _D = -3A	-	260	300	
Ciss	Input Capacitance	V _{DS} = -50V, V _{GS} = 0V, f = 1.0MHz	-	760	-	pF
Coss	Output Capacitance		-	25	-	pF
Crss	Reverse Transfer Capacitance		-	12	-	pF
Qg	Total Gate Charge	V _{DD} = -50V, I _D = -5A, V _{GS} = -10V	-	11.5	-	nC
Qgs	Gate-Source Charge		-	1.3	-	nC
Qgd	Gate-Drain("Miller") Charge		-	2.9	-	nC
td(on)	Turn-On Delay Time	V _{DS} = -50V, I _D = -5A R _G =4.5Ω, R _L =25Ω V _{GEN} = - 10 V	-	12	-	ns
t _r	Turn-On Rise Time		-	5	-	ns
td(off)	Turn-Off Delay Time		-	35	-	ns
t _f	Turn-Off Fall Time		-	20	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-12.8	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = -1A	-	-	-1.3	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0V, I _{sd} = -3A, di/dt =100A/μs	-	25	-	nS
Q _{rr}	Reverse Recovery Charge		-	20	-	nC

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is V_{DD} =-72V,V_{GS} =-10V,L=0.1mH,I_{AS} =-17A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

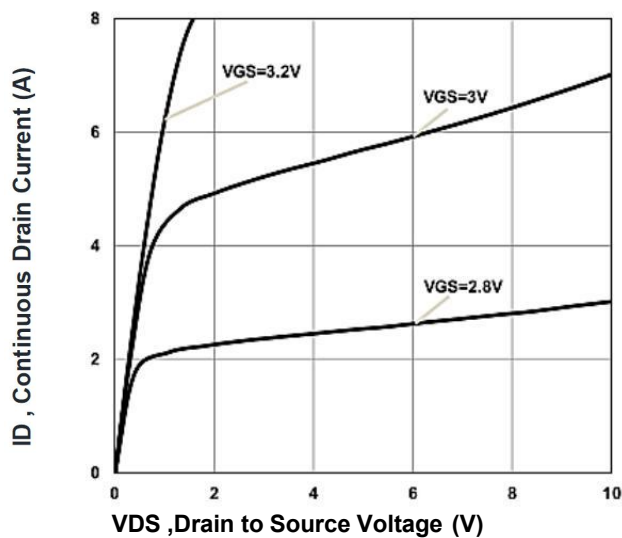


Figure 1. Typical Output Characteristics

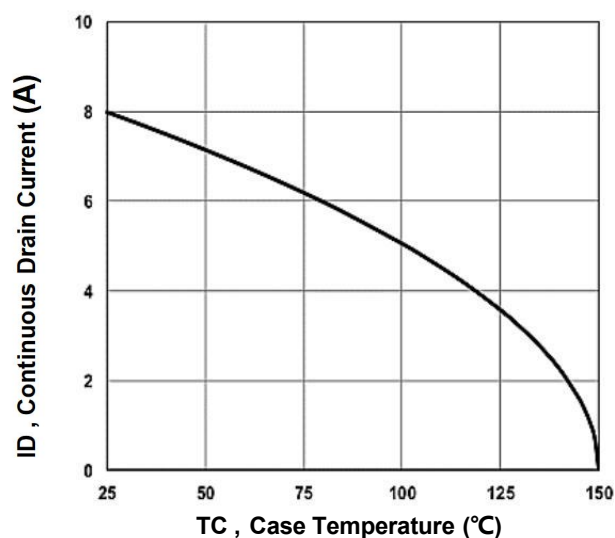


Figure 2. Continuous Drain Current vs. T_C

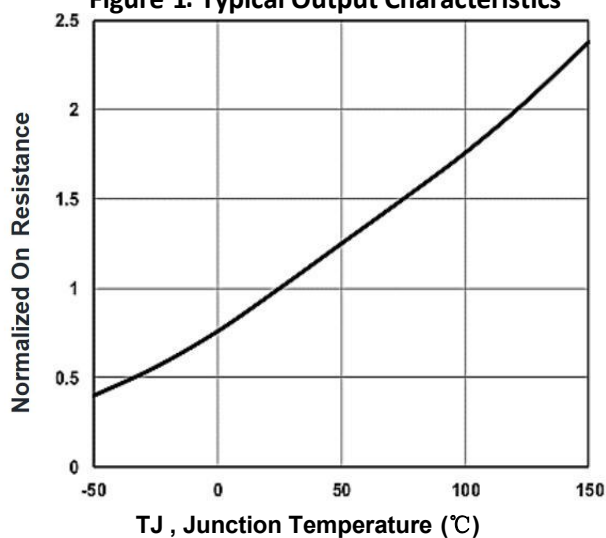


Figure 3. Normalized $R_{DS(on)}$ vs. T_J

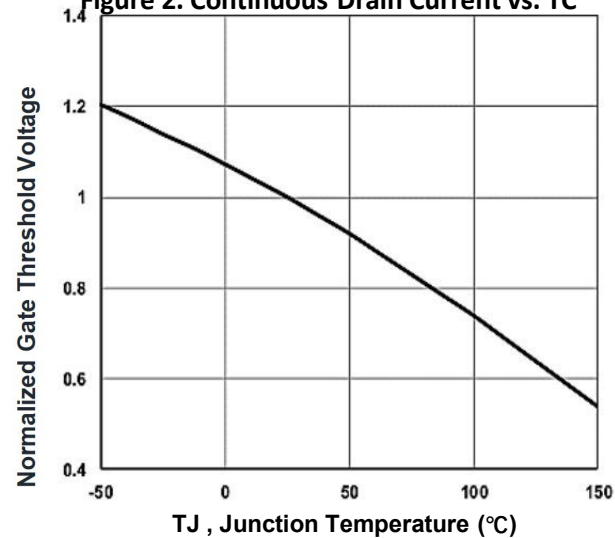


Figure 5. Normalized V_{th} vs. T_J

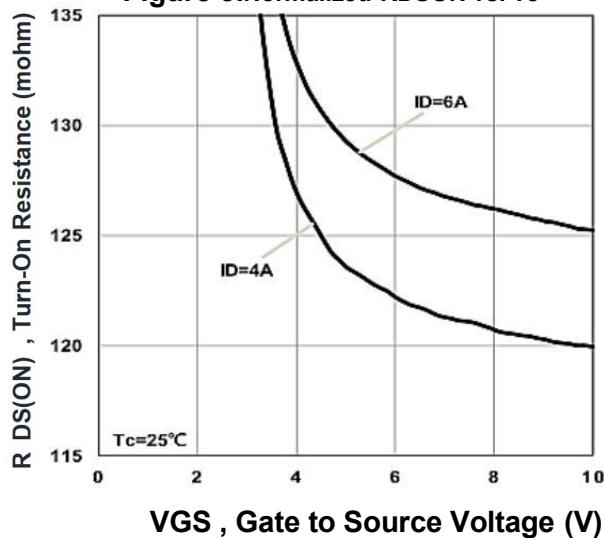


Figure 6. Turn-On Resistance vs. V_{GS}

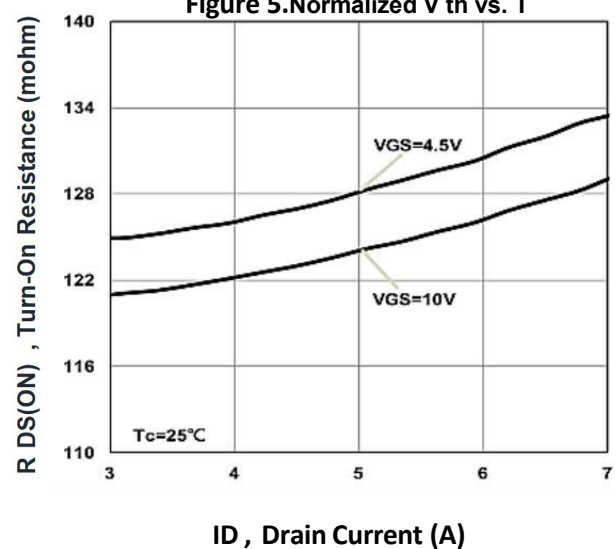
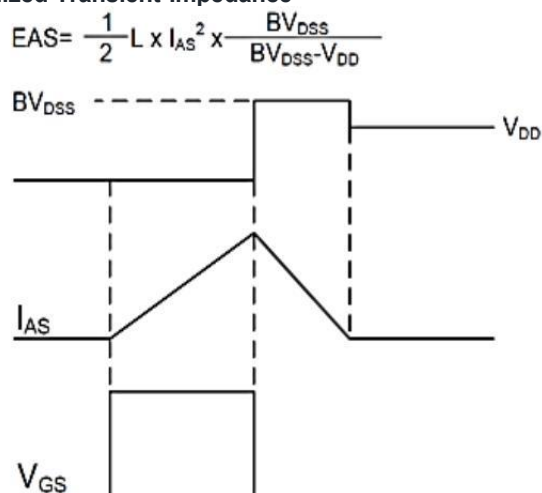
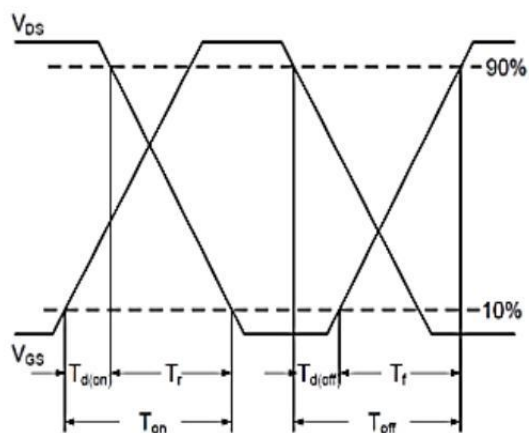
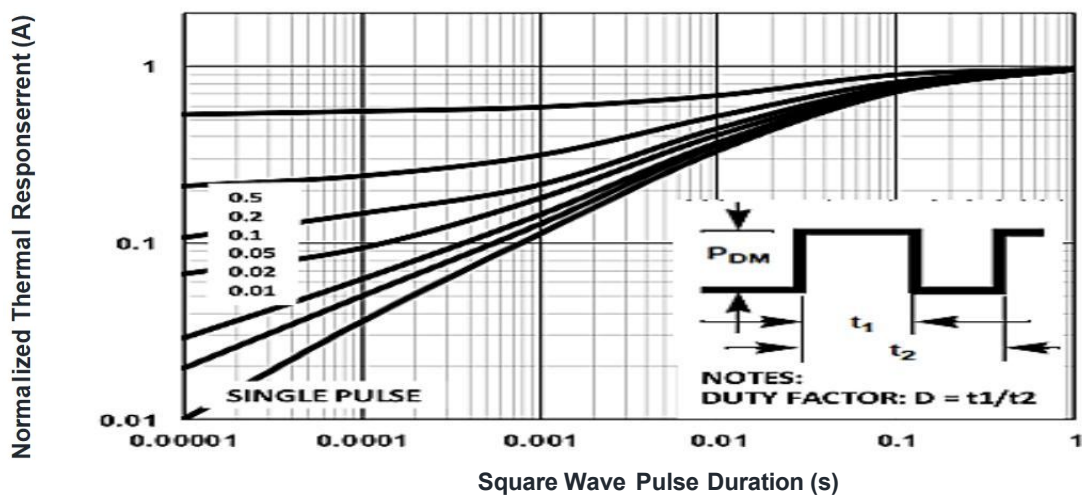
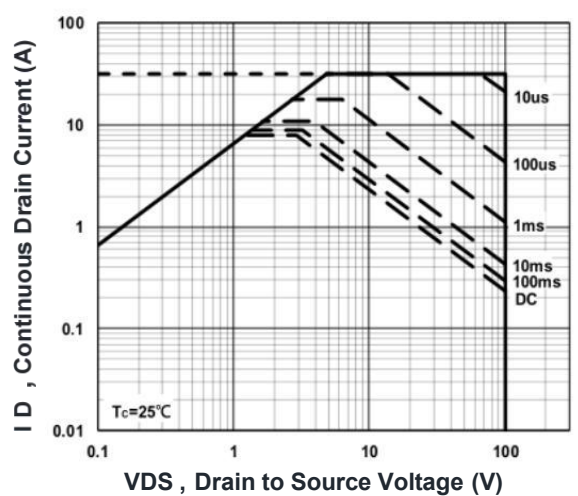
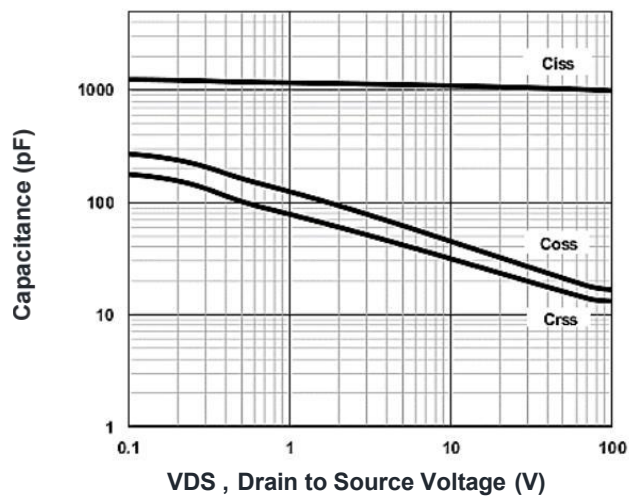
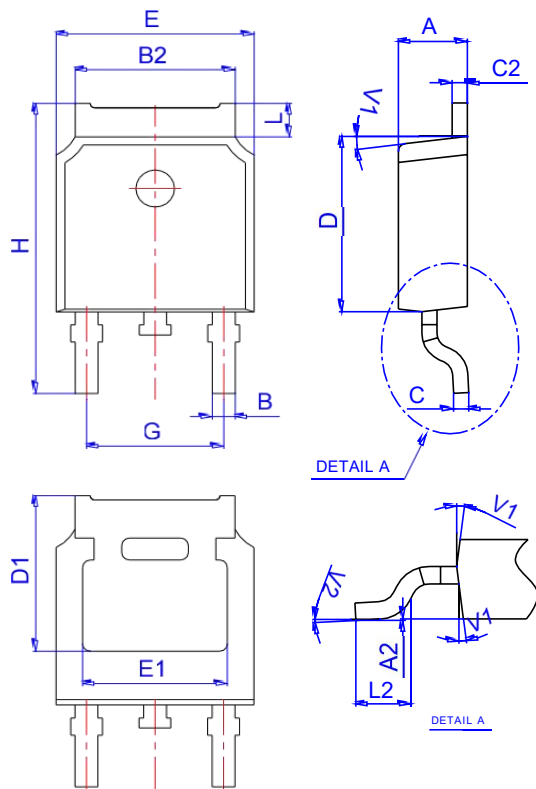


Figure 7. Turn-On Resistance vs. I_D

Typical Characteristics



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