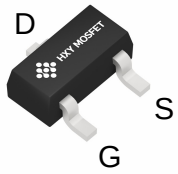
Description

The ST2304 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.

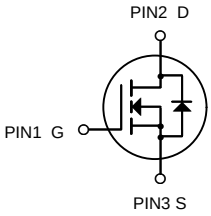


SOT-23-3L

General Features

V_{DS} = 30V I_D =5.8A

$R_{DS(ON)}$ < 28mΩ@ V_{GS}=10V



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
ST2304	SOT-23-3L	HXY MOSFET	3000

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

symbol	parameter	limit	unit
V_{DS}	Drain-source voltage	30	V
V_{GS}	Gate-source voltage	±20	V
I_D	Drain current-continuous[a]@Tj=125℃	5.8	A
IDM	-pulse [b]	20	A
Is	Drain-source Diode forward current	5.8	A
P_D	Maximum power dissipation	1.4	W
Tj	Operating junction Temperature range	-55—150	℃
Rth JA	Thermal Resistance junction-to ambient	100	℃/W

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30	-	-	V
Zero gate voltage drain current	IDSS	V_{DS}=30V, V_{GS}=0V	-	-	1	μA
Gate-body leakage	IGSS	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
Gate threshold voltage	VGS(th)	V_{DS}=V_{GS}, I_D=250μA	0.8	1.4	2.2	V
Drain-source on-state resistance	RDS(ON)	V_{GS}=10V, I_D=5A	-	24	28	mΩ
		V_{GS}=4.5V, I_D=4A		26	32	
Forward transconductance	gfs	V_{GS}=5V, I_D=5A	-	33	-	S
Input capacitance	C_{ISS}	V_{DS}=15V ,V_{GS}=0V f=1.0MHz		255		pF
Output capacitance	COSS			45		
Reverse transfer capacitance	CRSS			35		
Turn-on delay time	tD(ON)	V_{DS}=15V V_{GS}=10V R_L=2.6 ohm R_{GEN}=3ohm	-	4.5	-	ns
Rise time	tr		-	2.5	-	
Turn-off delay time	tD(OFF)		-	14.5	-	
Fall time	tf		-	3.5	-	
Total gate charge	Qg	V_{DS}=15V,I_D=5.8A V_{GS}=10V	-	5.2	-	nC
Gate-source charge	Qgs		-	0.85	-	
Gate-drain charge	Qgd		-	1.3	-	
Diode forward voltage	V_{SD}	V_{GS}=0V,Is=1A	-	0.76	1.16	V

Notes:

1、surface mounted on FR4 board,t≤10sec

2、pulse test: pulse width≤300μs,duty≤2%

3、guaranteed by design, not subject to production testing

Typical Performance Characteristics

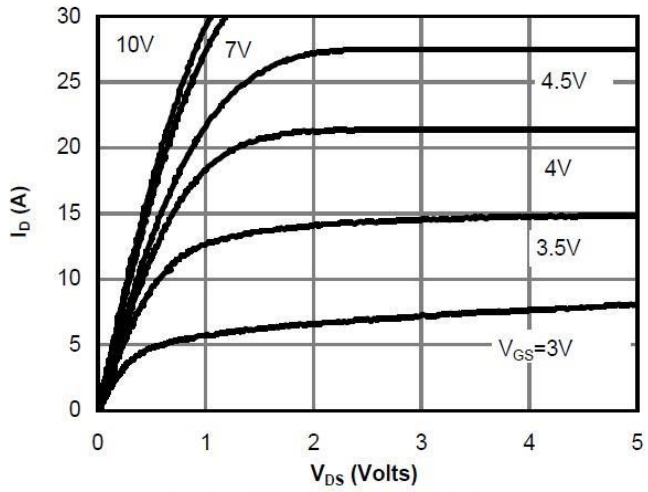


Fig 1: On-Region Characteristics

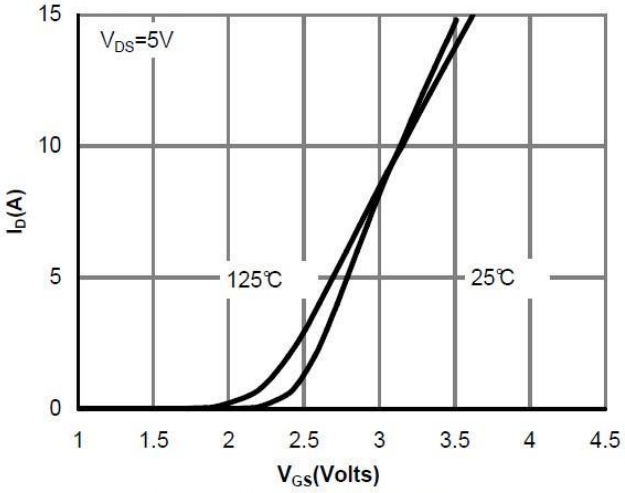


Figure 2: Transfer Characteristics

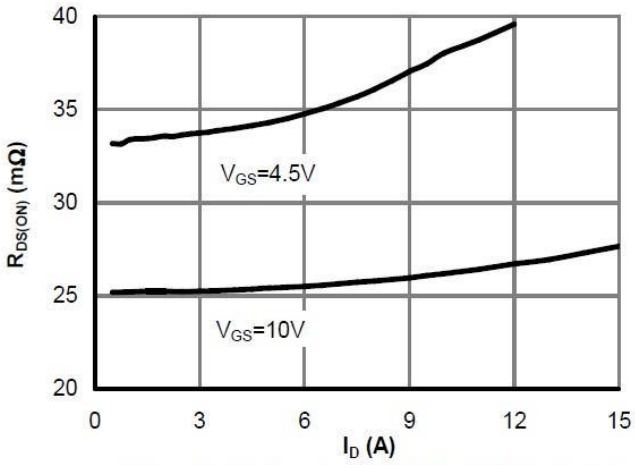


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

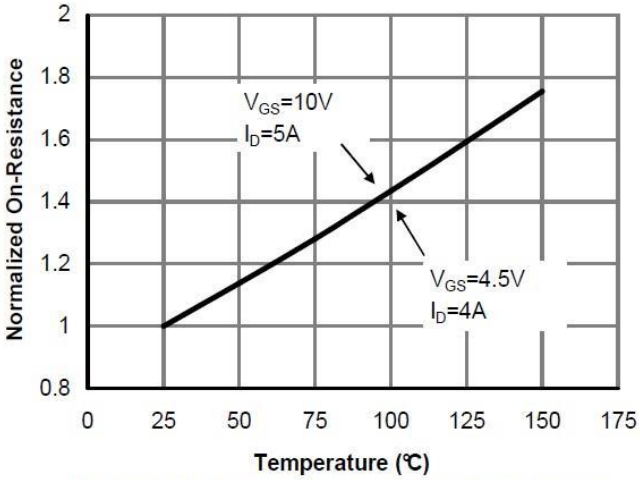


Figure 4: On-Resistance vs. Junction Temperature

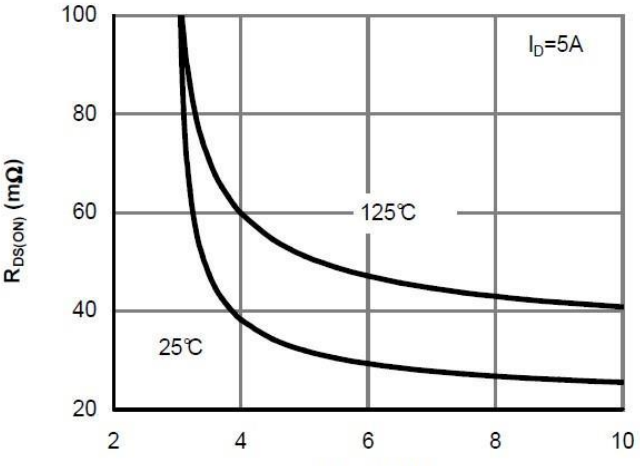


Figure 5: On-Resistance vs. Gate-Source Voltage

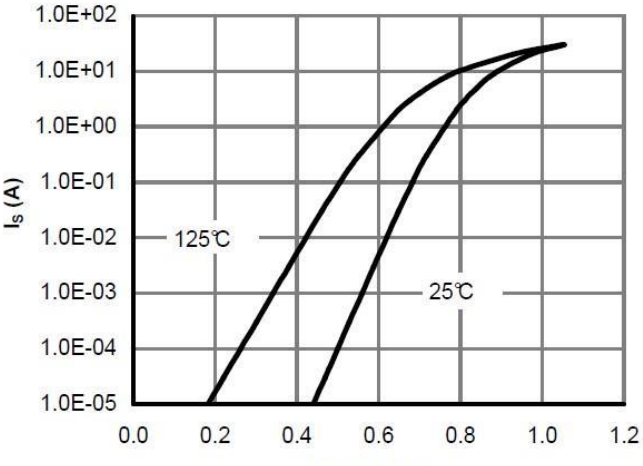


Figure 6: Body-Diode Characteristics

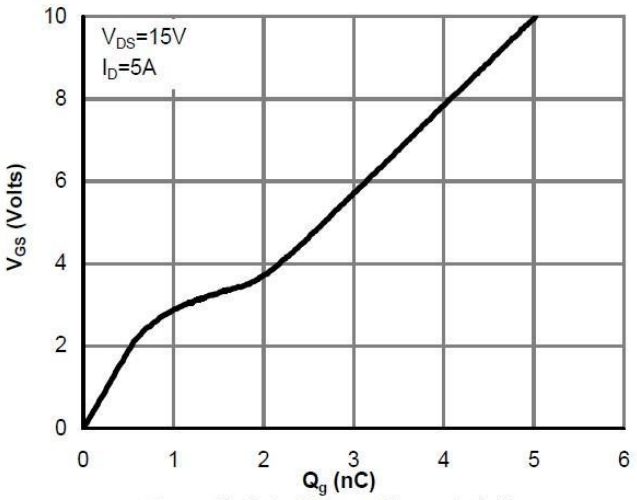


Figure 7: Gate-Charge Characteristics

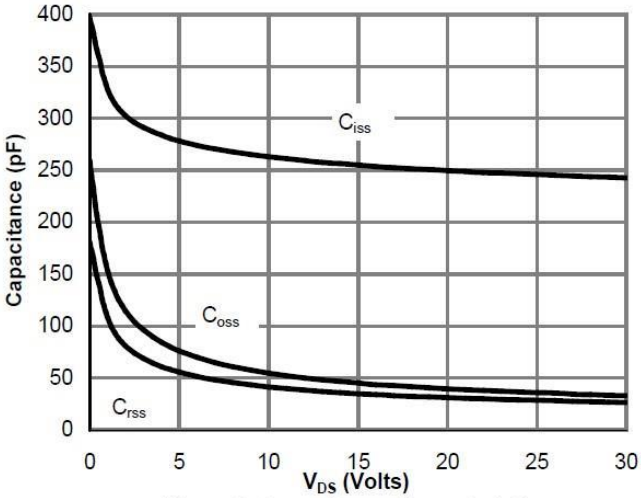


Figure 8: Capacitance Characteristics

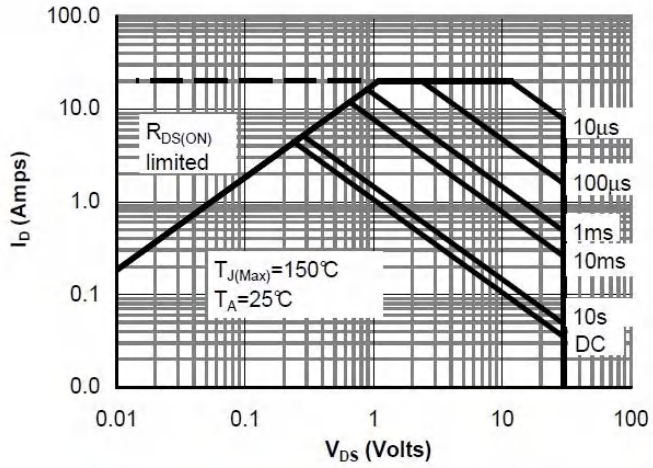


Figure 10: Maximum Forward Biased Safe Operating Area

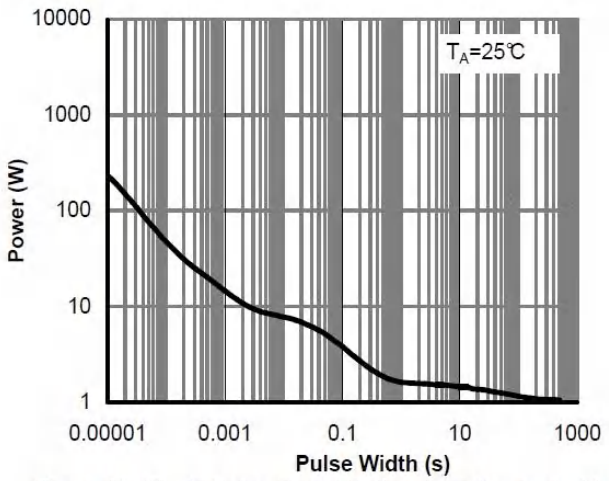


Figure 11: Single Pulse Power Rating Junction-to-Ambient

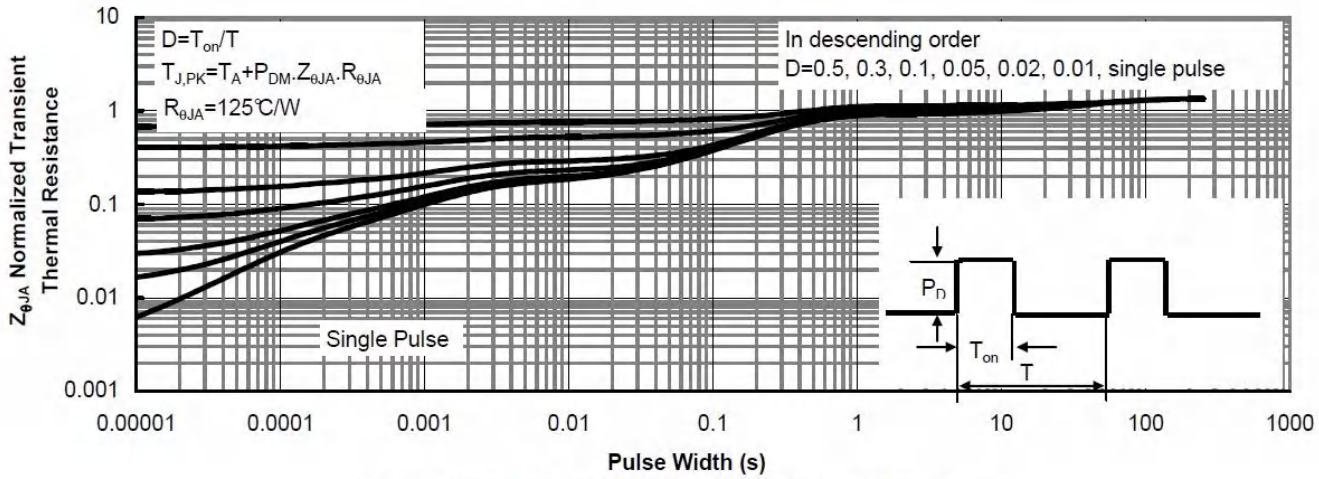
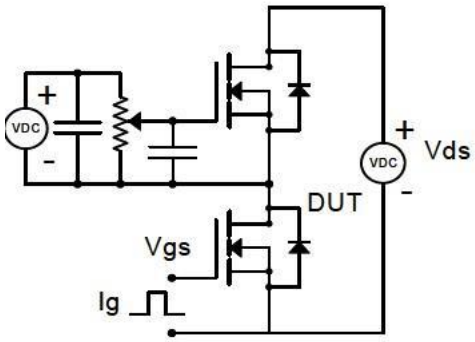
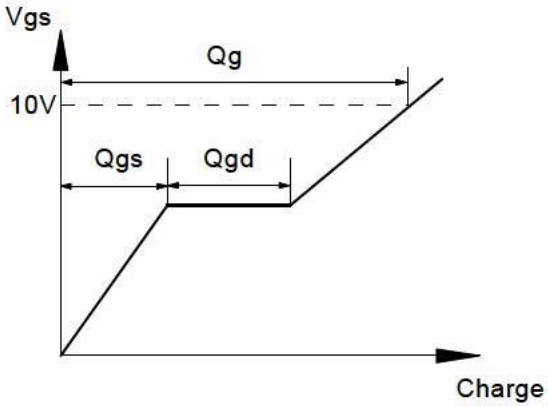


Figure 12: Normalized Maximum Transient Thermal Impedance

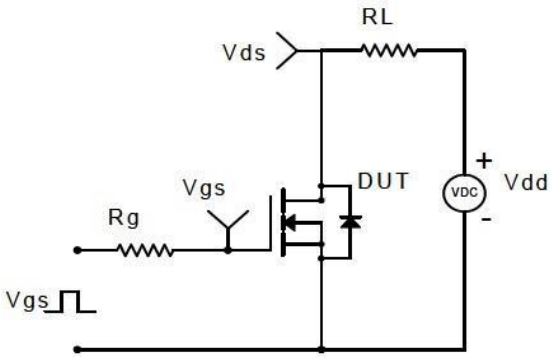
Gate Charge Test Circuit & Waveform

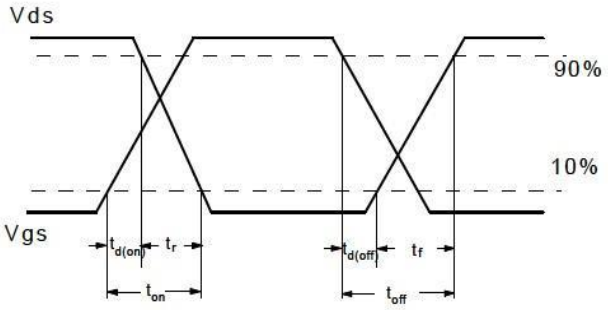




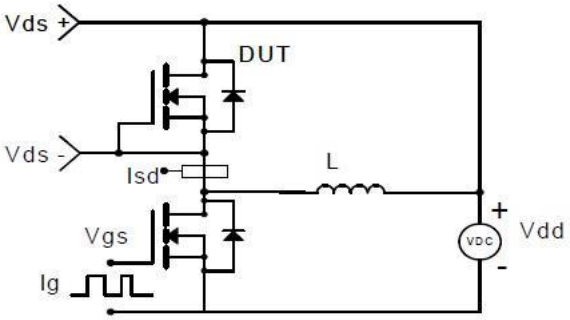
Resistive Switching Test Circuit & Waveforms

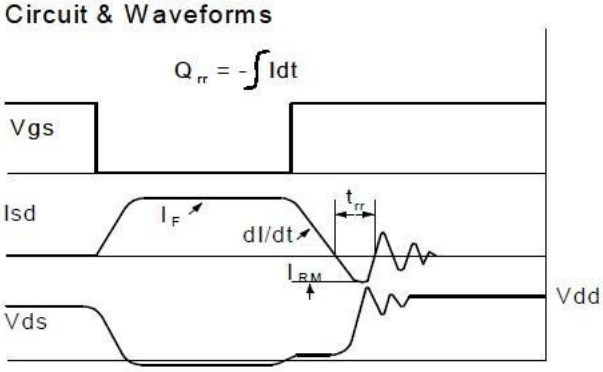
Resistive Switching Test Circuit & Waveforms



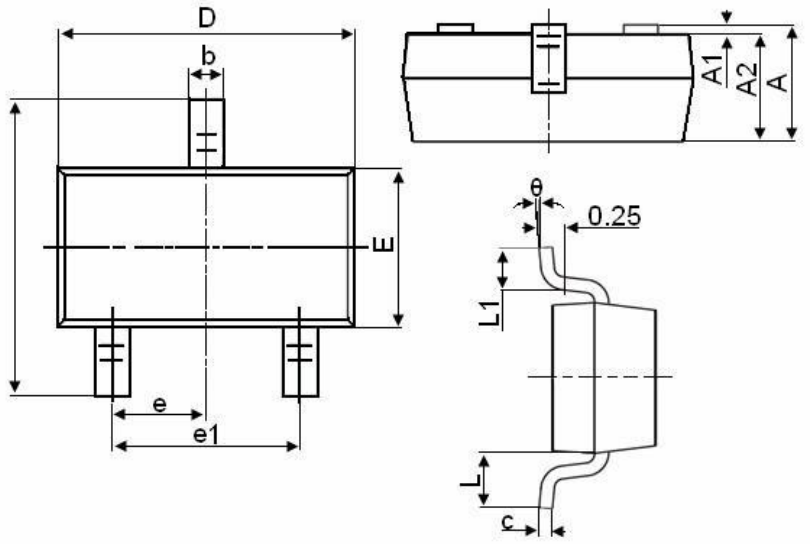


Diode Recovery Test Circuit & Waveforms





SOT-23-3L Package Information



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.800	3.000
E	1.500	1.700
E1	2.650	2.950
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.600
θ	0°	8°

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HT7540-1 HXY2101EI IRLML6246PBF HMCP602-I/SN HT7150 P6SMB200A PESD5V0S1BB SS10100
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