1. Product Information

1.1 Features

- ☑ Surface-mounted package
- ☑ Advanced trench cell design
- ☑ Extremely low threshold voltage

1.2 Applications

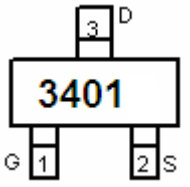
- ☑ Portable appliances
- ☑ Battery management

1.3 Quick reference

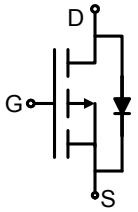
- ☑ BV ≧- 30 V
- ☑ P_{tot} ≦ 1.3 W
- ☑ I_D ≦ -4.2A
- ☑ $R_{DS(ON)}$ = 42 mΩ @ V_{GS} = -10V
  $R_{DS(ON)}$ = 48mΩ @ V_{GS} = -4.5V
  $R_{DS(ON)}$ = 68mΩ @ V_{GS} = -2.5V

2. Pin Description

Pin	Description	Simplified Outline	Symbol



SOT-23 top view



3. Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_A = 25 ℃	-	-30	V
V_{GS}	Gate-Source Voltage	T_A = 25 ℃	-	± 20	V
I_D*	Drain Current	T_A = 25 ℃, V_{GS} = 4.5 V	-	-4.7	A
I_{DM}*,**	Pulsed Drain Current	T_A = 25 ℃, V_{GS} = 4.5 V	-	-20	A
P_{tot}*	Total Power Dissipation	T_A = 25 ℃	-	1.3	W
		T_A = 100 ℃	-	0.8	
T_{stg}	Storage Temperature		- 55	150	℃
T_J	Junction Temperature		-	150	℃
I_S*	Diode Forward Current	T_A = 25 ℃	-	-4.7	A
$R_{\theta JA}$*	Thermal Resistance- Junction to Ambient		-	150	℃ / W

Notes：

* Surface Mounted on 1 in^2 pad area, t ≤ 10 sec

** Pulse width ≤ 300 μs, duty cycle ≤ 2 %

4. Marking Information

Product Name	Marking
WTM3401	**3401**

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
WTM3401	**SOT23**				

Note: NHCX defines " Green " as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C)

6. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = 250 μA	-30	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 μA	-0.5	-	-1.3	V
I_{DSS}	Drain Leakage Current	V_{DS} = -30 V, V_{GS} = 0 V	-	-	-1	μA
		T_J = 85 ℃	-	-	-30	μA
I_{GSS}	Gate Leakage Current	V_{GS} = ± 10 V, V_{DS} = 0 V	-	-	± 100	nA
$R_{DS(ON)}$[a]	On-State Resistance	V_{GS} = -10 V, I_{DS} = -4 A	-	42	52	mΩ
		V_{GS} = -4.5 V, I_{DS} = -2 A	-	48	65	
		V_{GS} = -2.5 V, I_{DS} = -1 A		68	85	
Diode Characteristics						
V_{SD}[a]	Diode Forward Voltage	I_{SD} = -4.4 A, V_{GS} = 0 V	-	-	-1.2	V
t_{rr}	Reverse Recovery Time	I_{SD} =-4.4 A, dI_{SD}/dt = 100 A/μs	-	38	-	nS
Q_{rr}	Reverse Recovery Charge		-	17	-	nC
Dynamic Characteristics[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = -15 V Frequency = 1 MHz	-	950	-	pF
C_{oss}	Output Capacitance		-	115	-	
C_{rss}	Reverse Transfer Capacitance		-	75	-	
t_d(on)	Turn-on Delay Time	V_{DS} = -15 V, V_{GEN} = -10 V, R_G = 6 Ω, R_L = 6 Ω, I_{DS} = -4 A	-	7	-	nS
t_r	Turn-on Rise Time		-	3	-	
t_d(off)	Turn-off Delay Time		-	30	-	
t_f	Turn-off Fall Time		-	12	-	
Gate Charge Characteristics[b]						
Q_g	Total Gate Charge	V_{DS} = -15 V, V_{GS} = -4.5 V, I_{DS} =-4 A	-	9.5	-	nC
Q_{gs}	Gate-Source Charge		-	2	-	
Q_{gd}	Gate-Drain Charge		-	3	-	

Notes：

a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

7. Typical Characteristics

Typical Electrical and Thermal Characteristics

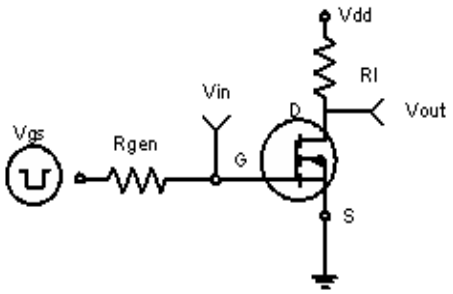


Figure 1:Switching Test Circuit

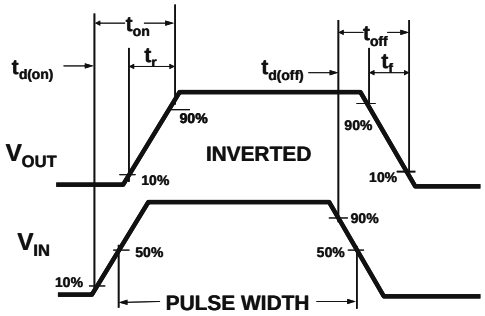
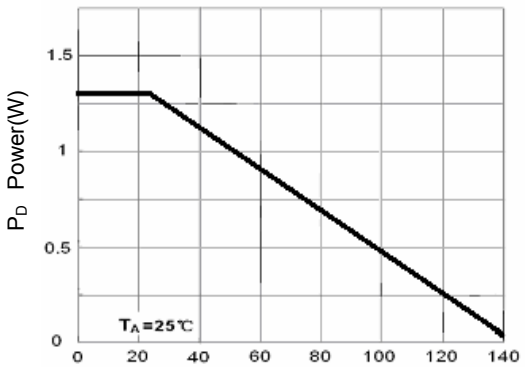
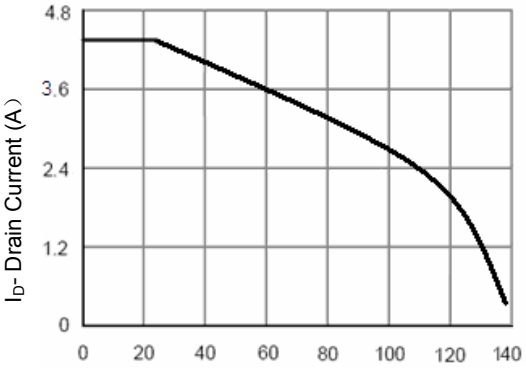


Figure 2:Switching Waveforms



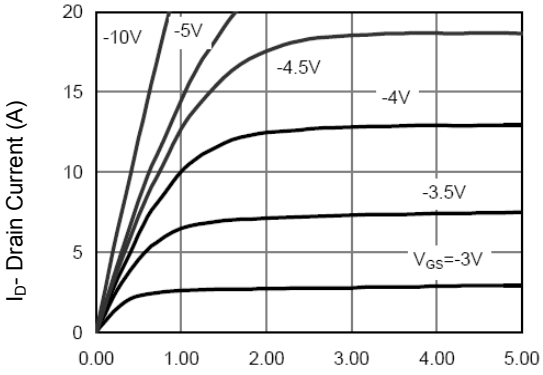
TJ-Junction Temperature(℃)

Figure 3 Power Dissipation



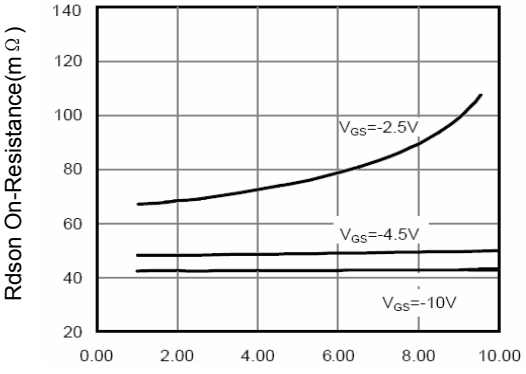
TJ-Junction Temperature(℃)

Figure 4 Drain Current



Vds Drain-Source Voltage (V)

Figure 5 Output Characteristics



ID- Drain Current (A)

Figure 6 Drain-Source On-Resistance

7. Typical Characteristics (cont.)

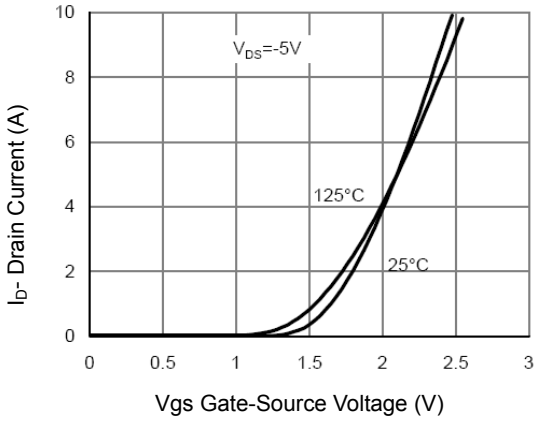


Figure 7 Transfer Characteristics

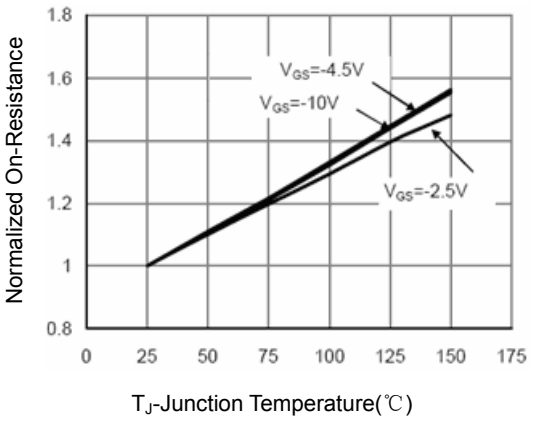


Figure 8 Drain-Source On-Resistance

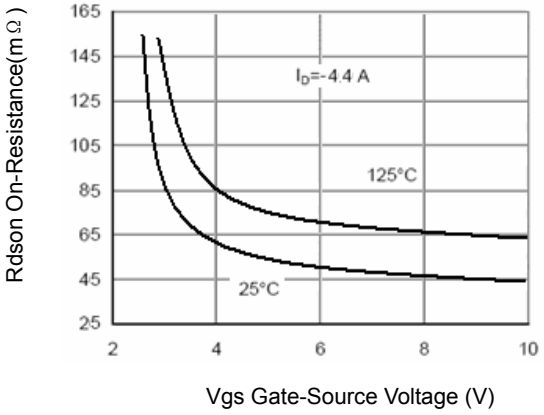


Figure 9 Rdson vs Vgs

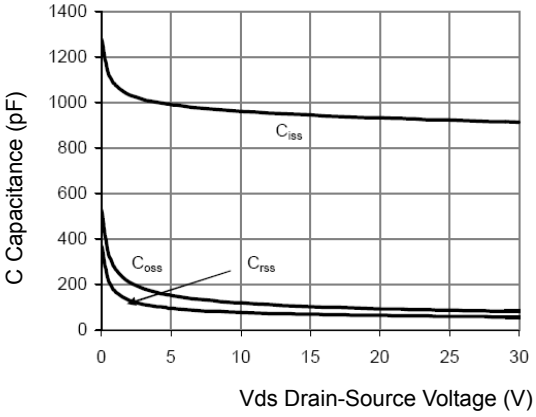


Figure 10 Capacitance vs Vds

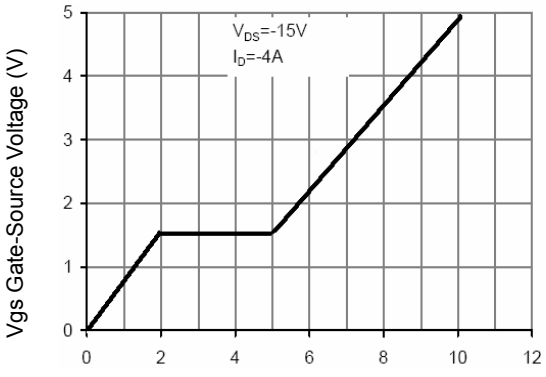


Figure 11 Gate Charge

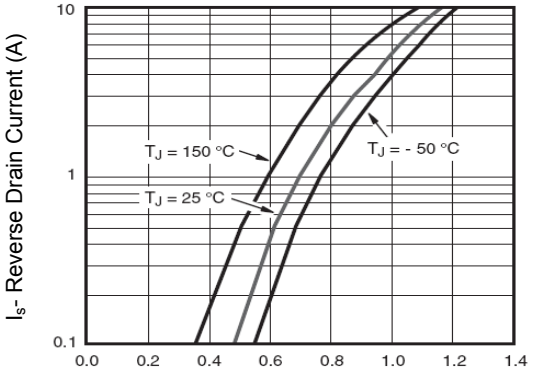
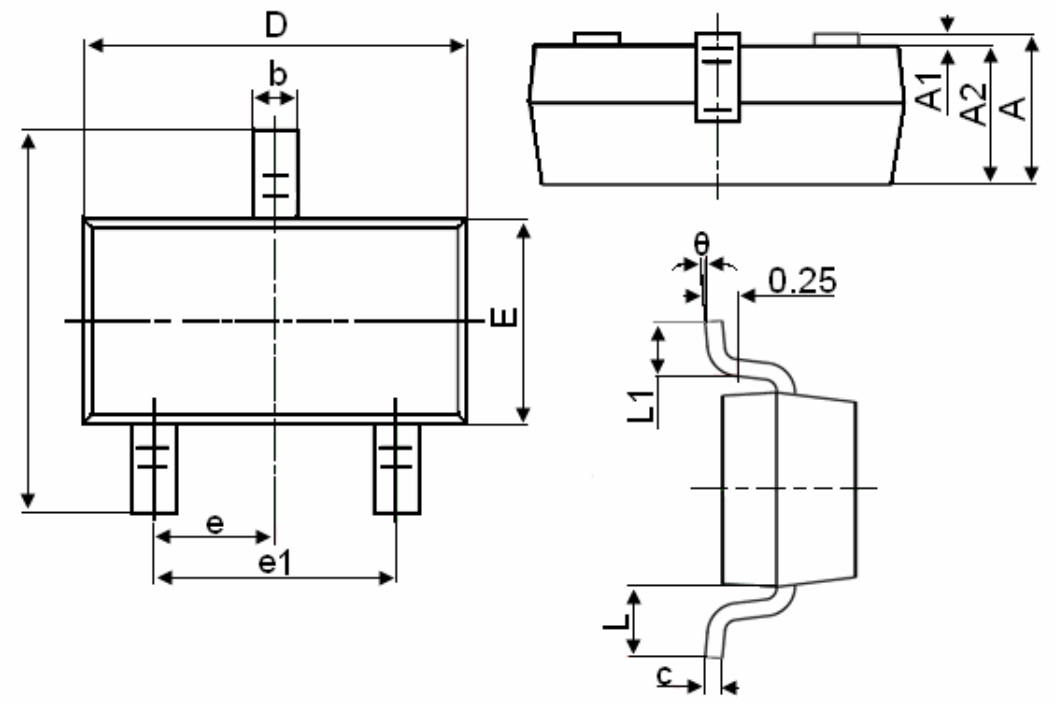


Figure 12 Source- Drain Diode Forward

8. Package Dimensions

SOT23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

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