

1. Product Information

1.1 Features

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

1.2 Applications

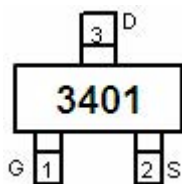
- ☒ Portable appliances
- ☒ Battery management

1.3 Quick reference

- ☒ $BV \geq -30\text{ V}$
- ☒ $P_{\text{tot}} \leq 1.3\text{ W}$
- ☒ $I_D \leq -4.2\text{ A}$
- ☒ $R_{\text{DS(ON)}} = 42\text{ m}\Omega @ V_{\text{GS}} = -10\text{ V}$
- $R_{\text{DS(ON)}} = 48\text{ m}\Omega @ V_{\text{GS}} = -4.5\text{ V}$
- $R_{\text{DS(ON)}} = 68\text{ m}\Omega @ V_{\text{GS}} = -2.5\text{ V}$

2. Pin Description

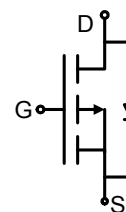
Pin Description



Simplified Outline



Symbol



3. Values

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

Notes :

* Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$

** Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

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 ($T_A = 25\text{ }^{\circ}\text{C}$ 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 °C	-	-	-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 $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
 b : Guaranteed by design, not subject to production testing

7. Typical Characteristics

Typical Electrical and Thermal Characteristics

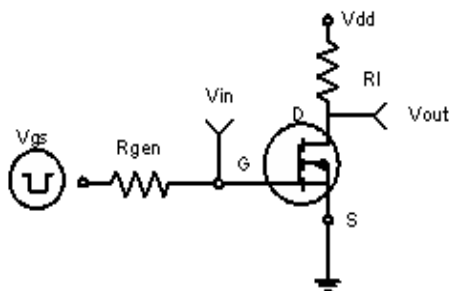


Figure 1: Switching Test Circuit

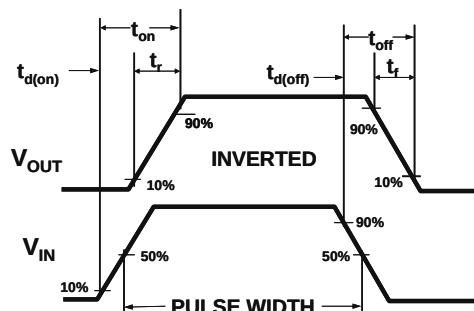


Figure 2: Switching Waveforms

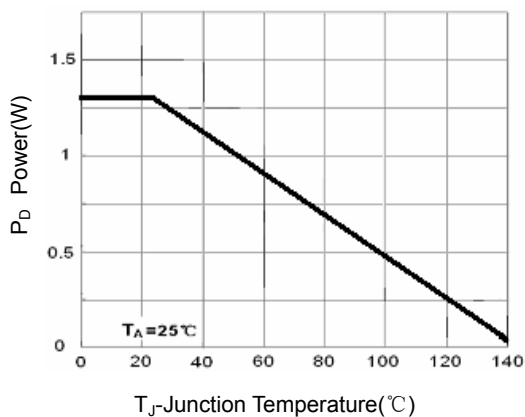


Figure 3 Power Dissipation

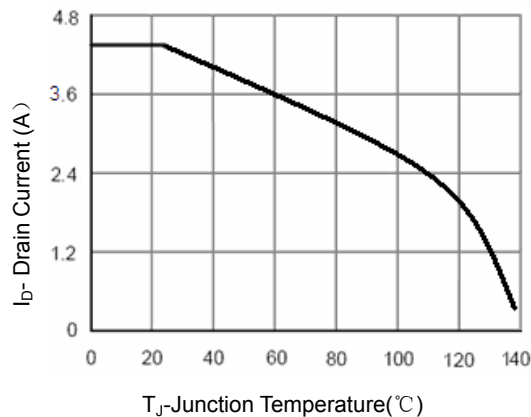


Figure 4 Drain Current

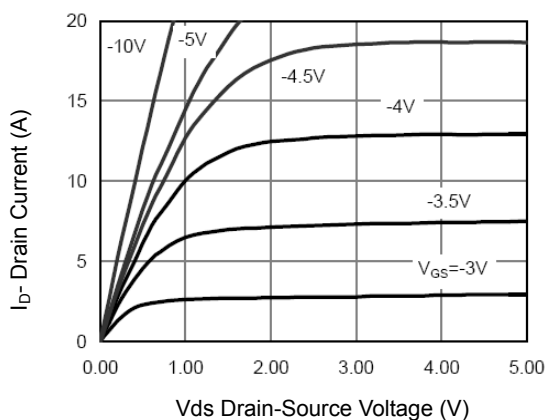


Figure 5 Output Characteristics

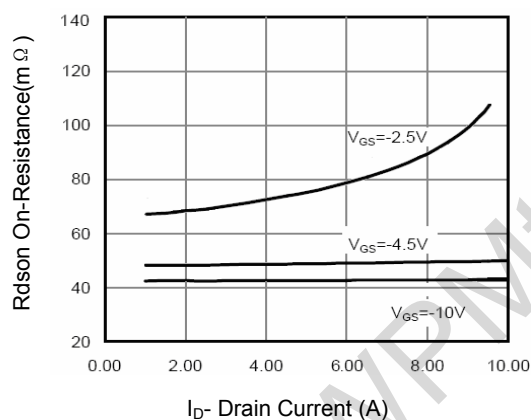


Figure 6 Drain-Source On-Resistance

7. Typical Characteristics (cont.)

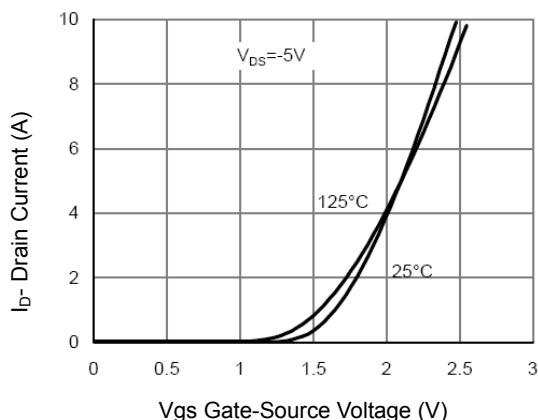


Figure 7 Transfer Characteristics

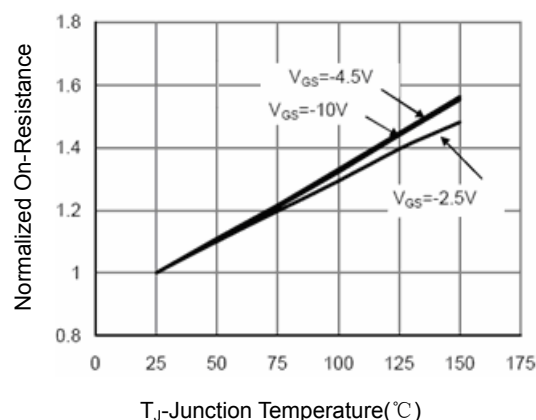


Figure 8 Drain-Source On-Resistance

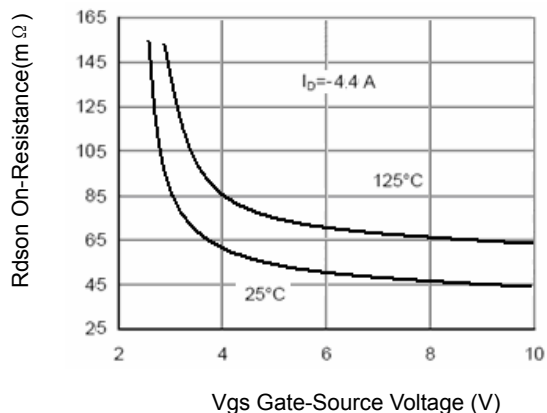


Figure 9 Rdson vs Vgs

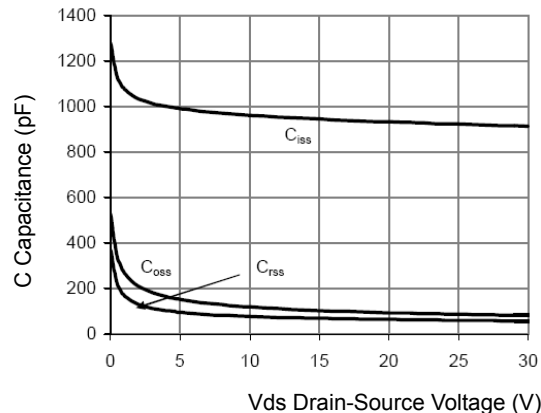


Figure 10 Capacitance vs Vds

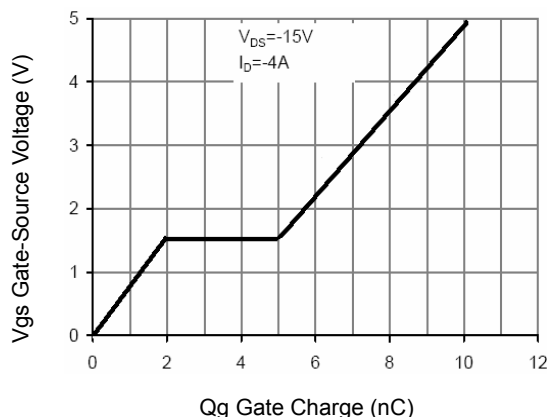


Figure 11 Gate Charge

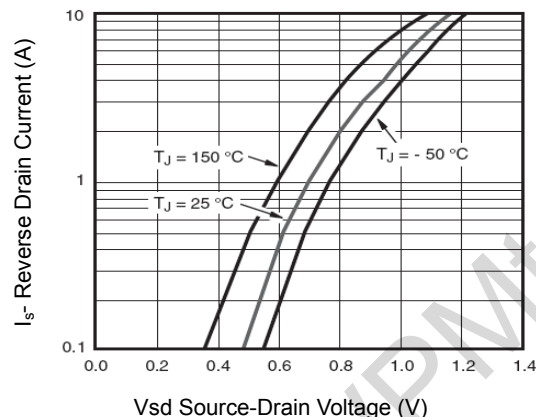
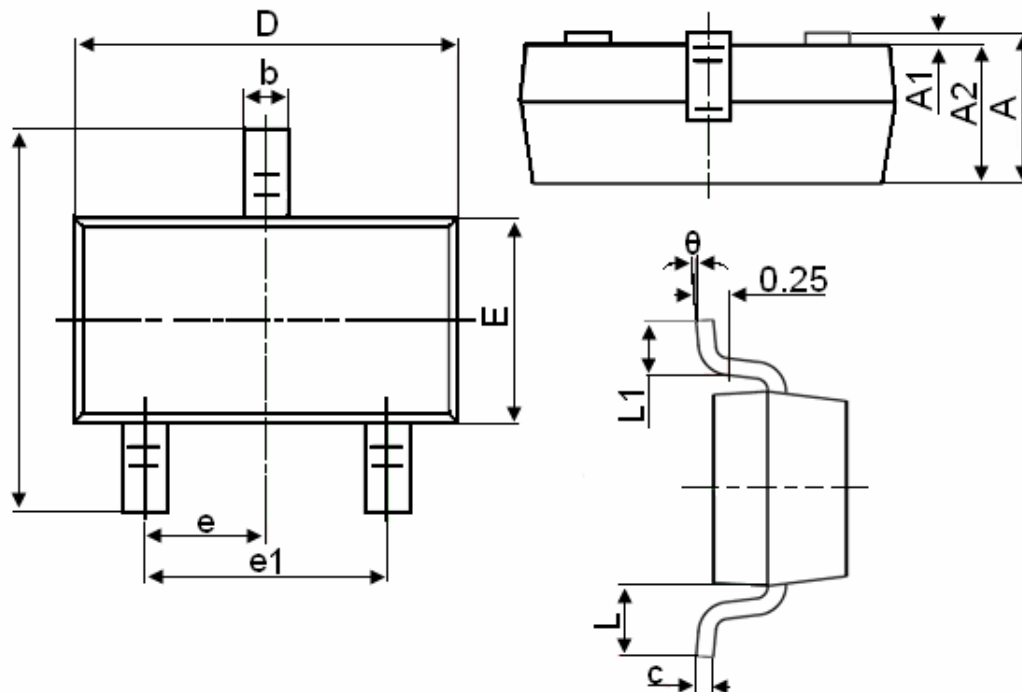


Figure 12 Source- Drain Diode Forward

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°

WPMtek reserves the right to make changes to the product specification and data in this document without notice. WPMtek makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does WPMtek assume any liability arising from the application or use of any products or circuits, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Any enquiry, please write to sales@wpmtek.com for further information.