

Features

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary

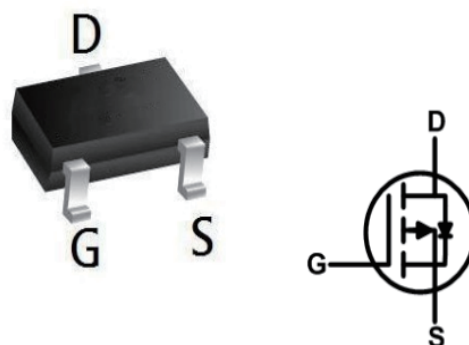
RoHS

BVDSS	RDSON	ID
-30V	42mΩ	-4.5A

Description

THE 3401A is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and efficiency for most of the small power switching and load switch applications. The 3401A meet the RoHS and Green Product requireme n t with full function reliability approved.

SOT 23 Pin Configurations



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_A=25^\circ C$	Continuous Drain Current	-4.5	A
$I_D@T_A=70^\circ C$	Continuous Drain Current	-3.6	A
I_{DM}	Pulsed Drain Current ₂	-16	A
$P_D@T_A=25^\circ C$	Total Power Dissipation ₃	1.4	W
$P_D@T_A=70^\circ C$	Total Power Dissipation ₃	0.9	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ₁	---	105	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ₁ (t ≤ 10s)	---	---	$^\circ C/W$

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -30V, V _{GS} = 0V	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{DS} = 0V, V _{GS} = ±12V	-	-	±100	nA
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.7	-1	-1.3	V
R _{DS(on)}	Drain-Source on-Resistance ₃	V _{GS} = -10V, I _D = -4.2A		42	60	mΩ
		V _{GS} = -4.5V, I _D = -4A	-	52	75	
		V _{GS} = -2.5V, I _D = -1A	-	60	90	
Dynamic Characteristics 4						
C _{iss}	Input Capacitance	V _{DS} = -15V, V _{GS} = 0V, f = 1MHz	-	745	-	pF
C _{oss}	Output Capacitance		-	70	-	
C _{rss}	Reverse Transfer Capacitance		-	57	-	
Switching Characteristics 4						
Q _g	Total Gate Charge	V _{GS} = -4.5V, V _{DS} = -15V, I _D = -4.2A	-	8	-	nC
Q _{gs}	Gate-Source Charge		-	1.8	-	
Q _{gd}	Gate-Drain Charge		-	2.7	-	
t _{d(on)}	Turn-on Delay Time	V _{GS} = -10V, V _{DD} = -15V, I _D = -4.2A, R _{GEN} = 6Ω	-	7	-	ns
t _r	Rise Time		-	3	-	
t _{d(off)}	Turn-off Delay Time		-	30	-	
t _f	Fall Time		-	12	-	
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage ₃	I _S = -4.2A, V _{GS} = 0V	-	-	-1.2	V
I _S	Continuous Source Current		-	-	-4.2	A

Note :

- 1.Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$
- 2.The data tested by surface mounted on a 1 inch2 FR-4 board with 20Z copper, The value in any given application depends on the user's specific board design.
- 3.Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4..This value is guaranteed by design hence it is not included in the production test.

P-Channel Typical Performance Characteristics

Figure1:Typical Output Characteristics

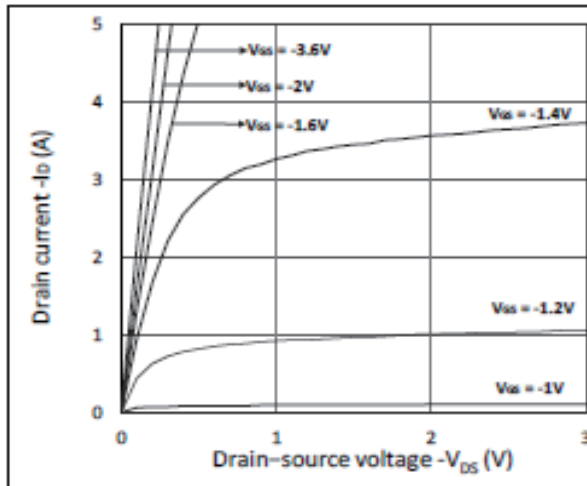


Figure 2:Transfer Characteristics

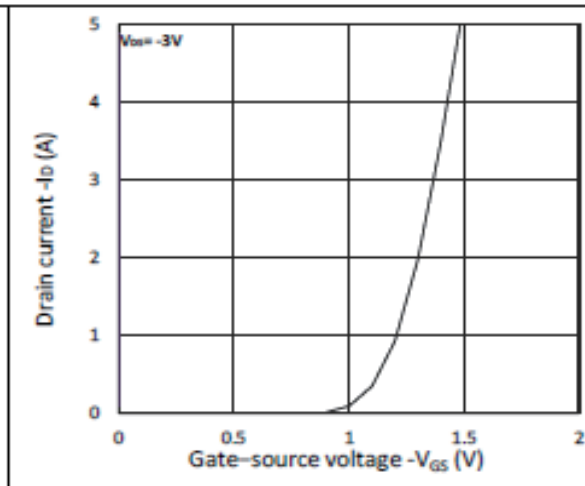


Figure 3:Forward Characteristics of Reverse

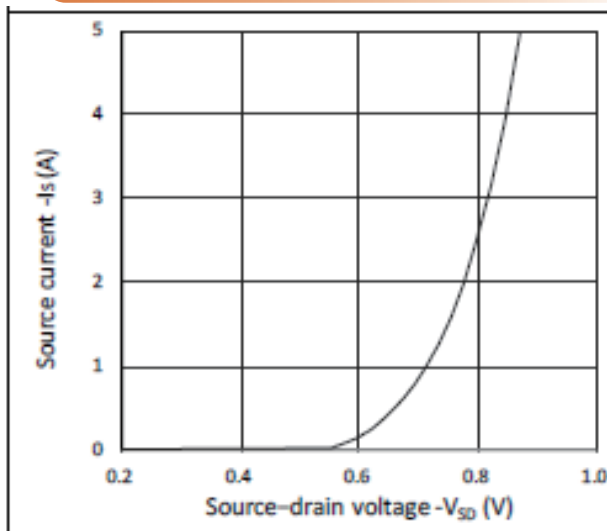


Figure 4: R_DS(ON) vs. V_GS

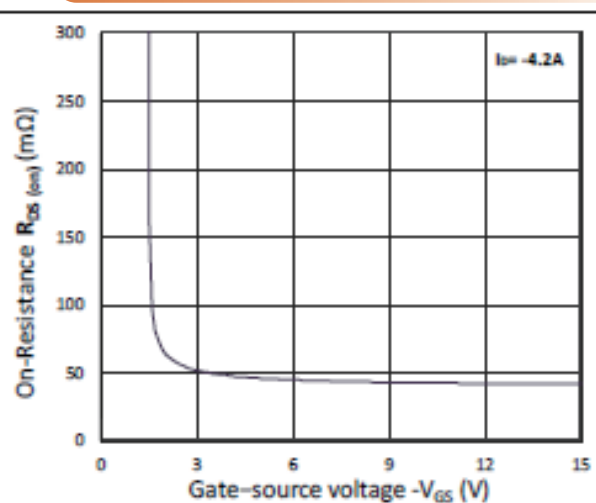


Figure 5: R_DS(ON) vs. I_D

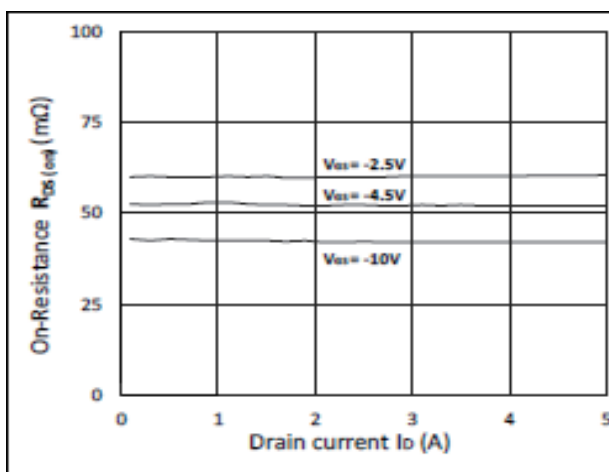
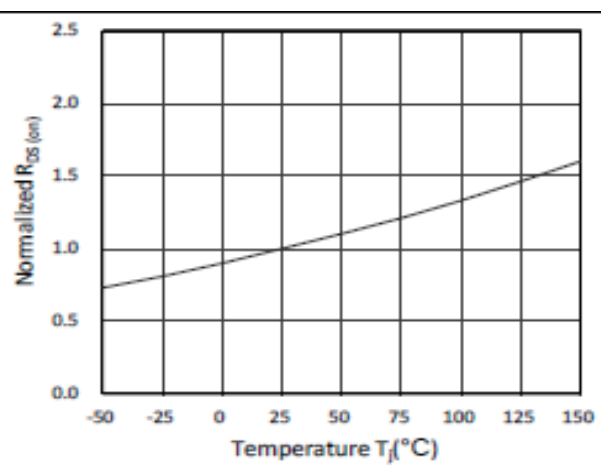


Figure 6: Normalized R_DS(on) vs. Temperature



P-Channel Typical Performance Characteristics

Figure7:Capacitance

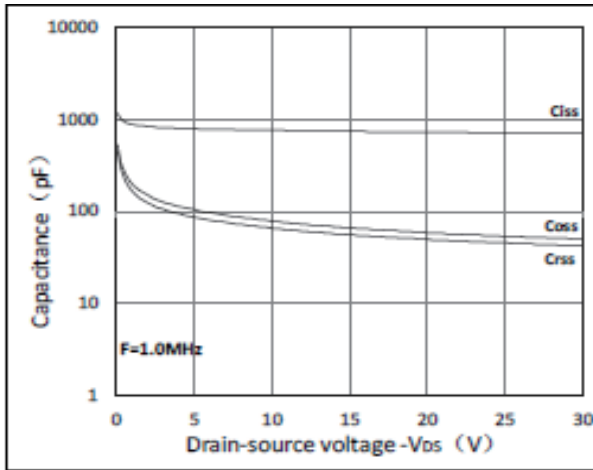


Figure 8: Safe Operating Area

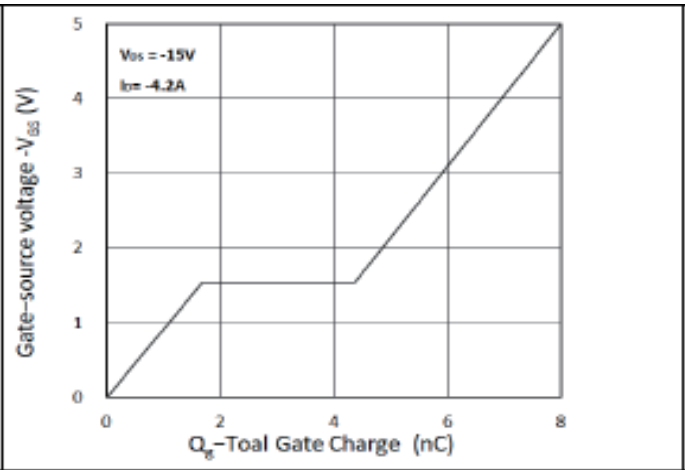


Figure9:Normalized Maximum Transient

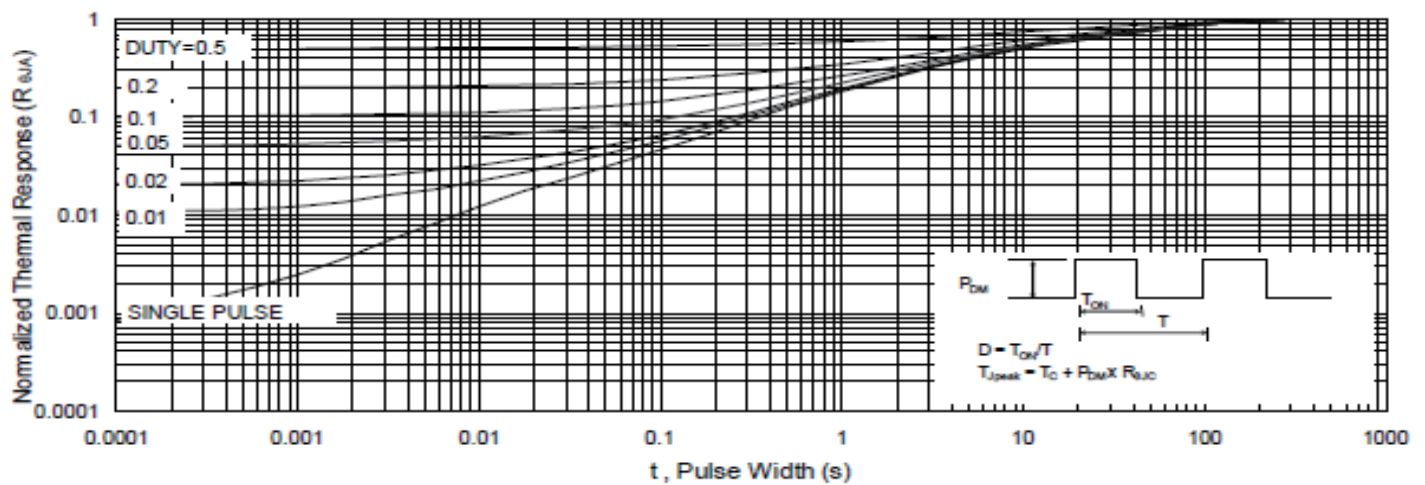


Figure10:Switching Time Waveform

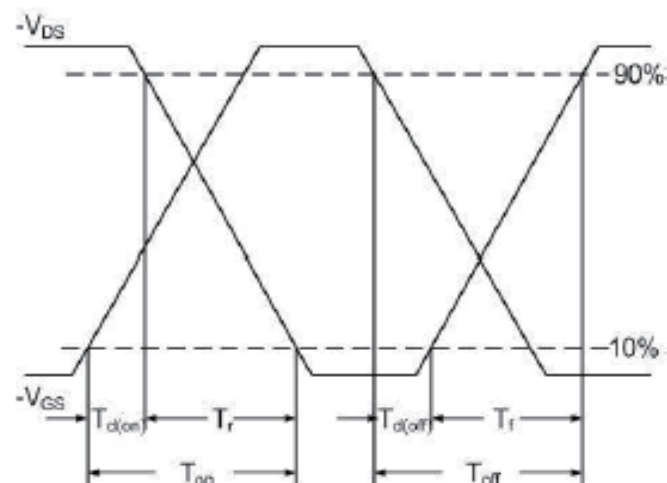
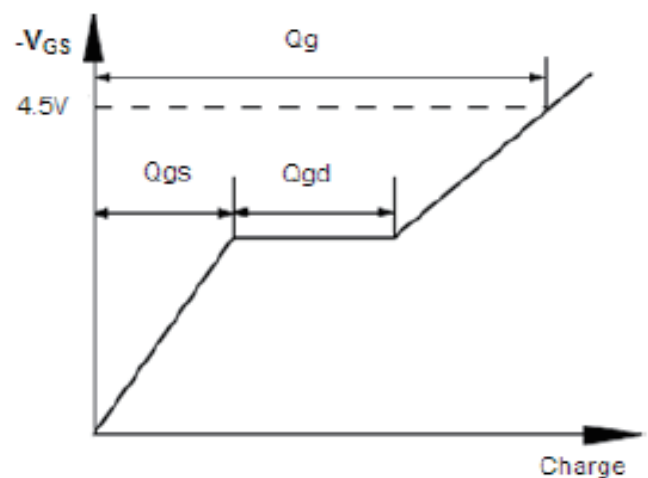
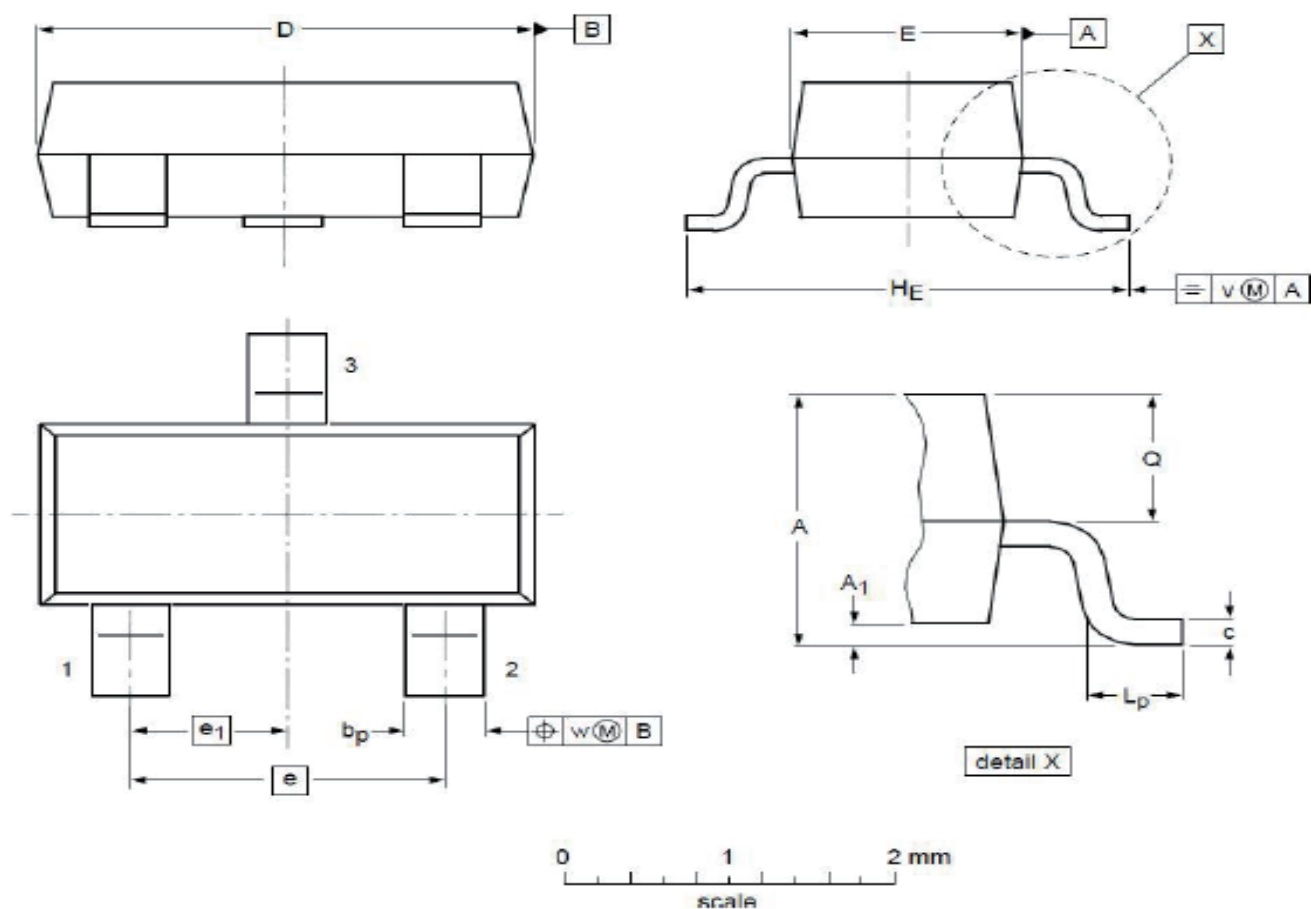


Figure 11: Gate Charge Waveform



PackageMechanicalData-SOT-23



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	A ₁	0.01	0.05	0.10
b _p	0.30	0.42	0.50	c	0.08	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	—	1.90	—	e ₁	—	0.95	—
H _E	2.25	2.40	2.55	L _p	0.30	0.42	0.50
Q	0.45	0.49	0.55	v	—	0.20	—
w	—	0.10	—				