

NCE P-Channel Enhancement Mode Power MOSFET



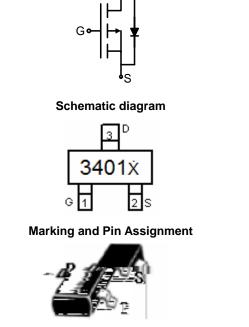
The NCE3401 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

General Features

- V_{DS} = -30V,I_D = -4.2A
 - $R_{DS(ON)} < 90m\Omega @ V_{GS}=-2.5V$
 - $R_{DS(ON)} < 75m\Omega @ V_{GS}$ =-4.5V
 - $R_{DS(ON)} < 55m\Omega @ V_{GS}=-10V$
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

- PWM applications
- Load switch
- Power management



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SOT-23 top view

Package Marking And Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3401 X	NCE3401	SOT-23	Ø180mm	8 mm	3000 units

Absolute Maximum Ratings (TA=25 unless otherwise noted)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	Vds	-30	V	
Gate-Source Voltage	Vgs	±12	V	
Drain Current-Continuous	I _D	-4.2	A	
Drain Current-Pulsed (Note 1)	I _{DM}	-30	A	
Maximum Power Dissipation	PD	1.2	W	
Operating Junction and Storage Temperature Range	TJ,TSTG	-55 To 150		

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	R _{0JA}	104	/W
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Electrical Characteristics (TA=25 unless otherwise noted)

Parameter	Symbol	Condition	Min	Тур	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250µA	-30		-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V,V _{GS} =0V	-	-	-1	μA



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Gate-Body Leakage Current	I _{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	±100	nA
On Characteristics (Note 3)					I.	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS}=V_{GS}$, $I_{D}=-250\mu A$	-0.7	-1	-1.3	V
		V _{GS} =-10V, I _D =-4.2A	-	48	55	mΩ
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-4A	-	56	75	mΩ
		V _{GS} =-2.5V, I _D =-1A		72	90	mΩ
Forward Transconductance	g fs	V _{DS} =-5V,I _D =-4.2A	-	10	-	S
Dynamic Characteristics (Note4)	·			•		
Input Capacitance	C _{lss}	- V _{DS} =-15V,V _{GS} =0V, F=1.0MHz	-	880	-	PF
Output Capacitance	C _{oss}		-	105	-	PF
Reverse Transfer Capacitance	C _{rss}		-	65	-	PF
Switching Characteristics (Note 4)	·			•		
Turn-on Delay Time	t _{d(on)}		-	7	-	nS
Turn-on Rise Time	tr	V _{DD} =-15V,I _D =-4.2A	-	3	-	nS
Turn-Off Delay Time	t _{d(off)}	V_{GS} =-10V, R_{GEN} =6 Ω	-	30	-	nS
Turn-Off Fall Time	t _f		-	12	-	nS
Total Gate Charge	Qg		-	8.5	-	nC
Gate-Source Charge	Q _{gs}	V _{DS} =-15V,I _D =-4.2A,V _{GS} =-4.5V	-	1.8	-	nC
Gate-Drain Charge	Q _{gd}		-	2.7	-	nC
Drain-Source Diode Characteristics		-	-			
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V,I _S =-4.2A	-	-	-1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, $t \le 10$ sec.

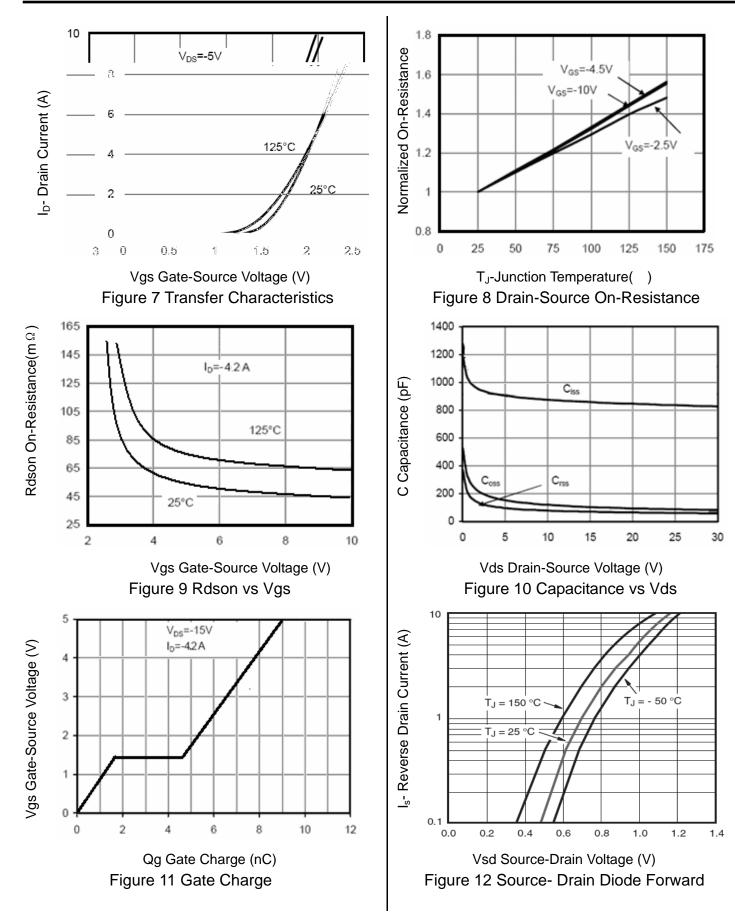
3. Pulse Test: Pulse Width \leq 300µs, Duty Cycle \leq 2%.

4. Guaranteed by design, not subject to production

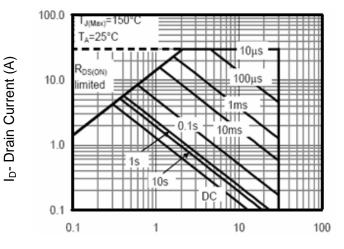


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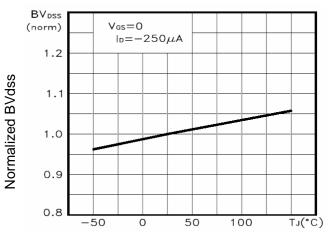




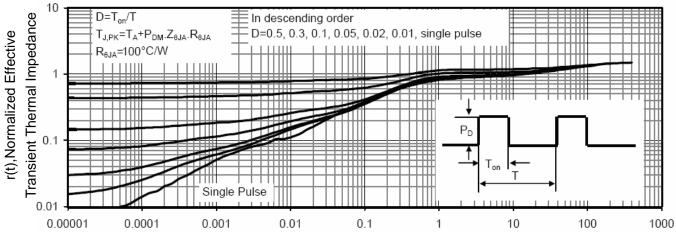


Vds Drain-Source Voltage (V)





T_J-Junction Temperature() Figure 14BV_{DSS} vs Junction Temperature

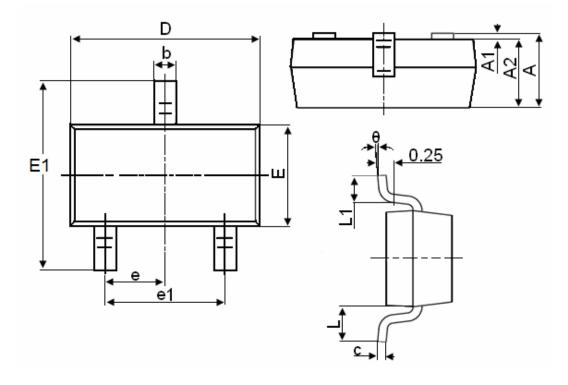


Square Wave Pluse Duration(sec)

Figure 15Normalized Maximum Transient Thermal Impedance



SOT-23 Package Information



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

Notes

- 1. All dimensions are in millimeters.
- 2. Tolerance ±0.10mm (4 mil) unless otherwise specified
- 3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
- 4. Dimension L is measured in gauge plane.
- 5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.



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