

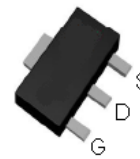
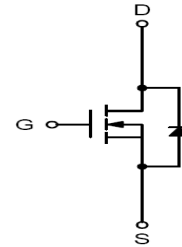
The 3401 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

- $R_{DS(ON)} < 70\text{m}\Omega$ @ $V_{GS} = -4.5\text{V}$
 $R_{DS(ON)} < 60\text{m}\Omega$ @ $V_{GS} = -10\text{V}$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management



Top View SOT-89

ABSOLUTE MAXIMUM RATINGS($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage	± 12	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	-30	V	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ\text{C}$	
I_S	Diode Continuous Forward Current ^①	$T_C=25^\circ\text{C}$	-4.2	A
I_{DM}	Pulse Drain Current Tested ^①	$T_C=25^\circ\text{C}$	-16	A
I_D	Continuous Drain Current($V_{GS}=-10\text{V}$) ^①	$T_C=25^\circ\text{C}$	-4.2	A

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$, $I_D=-250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V$, $V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V$, $V_{DS}=0V$			± 100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu A$	-0.6		-1.8	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V$, $I_D=-4A$		46		$m\Omega$
		$V_{GS}=-4.5V$, $I_D=-2A$		52		$m\Omega$
DYNAMIC CHARACTERISTICS (Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=-15V$, $V_{GS}=0V$, $F=1.0\text{MHz}$		580		PF
Output Capacitance	C_{oss}			125		PF
Reverse Transfer Capacitance	C_{rss}			85		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-15V$, $I_D=-1A$, $V_{GEN}=-10V$, $R_{GEN}=6$, $R_L=15$		10		nS
Turn-on Rise Time	t_r			10		nS
Turn-Off Delay Time	$t_{d(off)}$			36		nS
Turn-Off Fall Time	t_f			25		nS
Total Gate Charge	Q_g	$V_{DS}=-15V$, $I_D=-5.5A$, $V_{GS}=-10V$		12		nC
Gate-Source Charge	Q_{gs}	$V_{DS}=-15V$, $I_D=-5.5A$, $V_{GS}=-4.5V$		2		nC
Gate-Drain Charge	Q_{gd}	$V_{DS}=-15V$, $I_D=-5.5A$, $V_{GS}=-10V$		3		nC
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V$, $I_S=-1A$		-0.8	-1.3	V

NOTES:

- Surface Mounted on FR4 Board, $t \leq 10$ sec.
- Pulse Test : Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

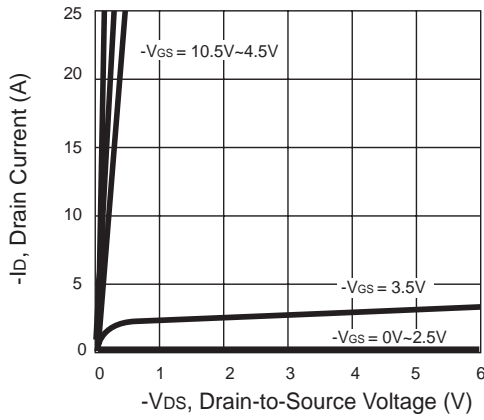


Figure 1. Output Characteristics

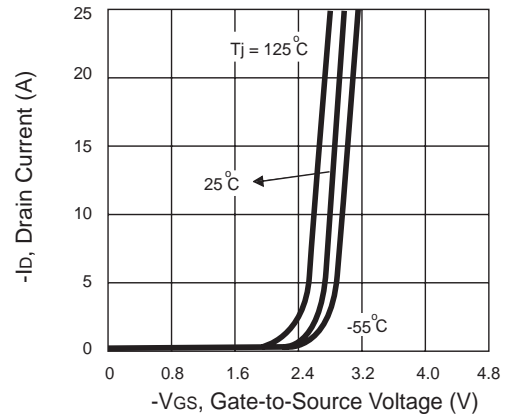


Figure 2. Transfer Characteristics

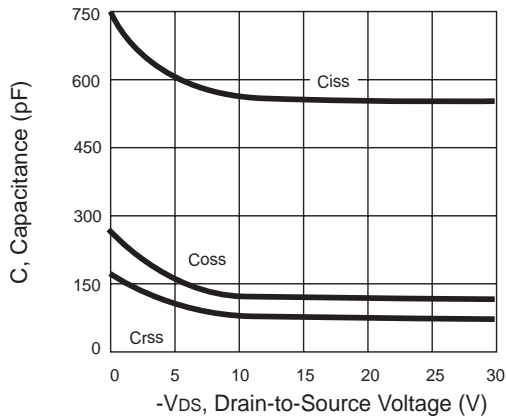


Figure 3. Capacitance

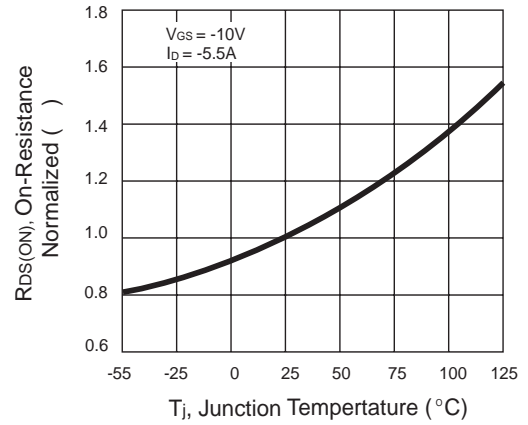


Figure 4. On-Resistance Variation with Temperature

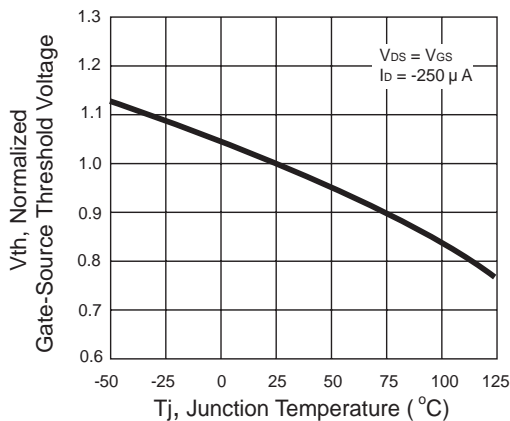


Figure 5. Gate Threshold Variation with Temperature

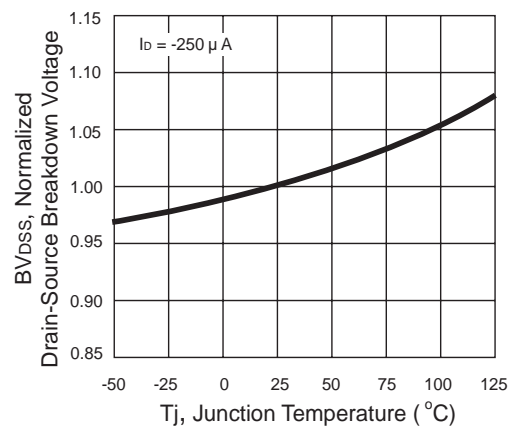


Figure 6. Breakdown Voltage Variation with Temperature

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

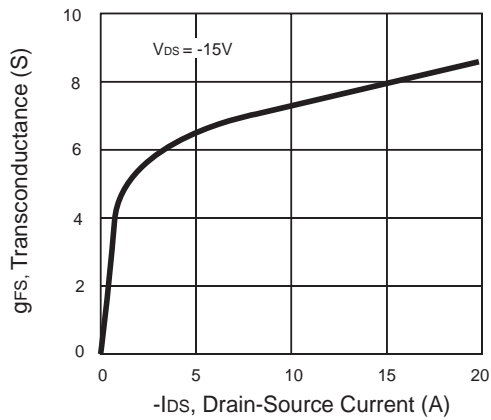


Figure 7. Transconductance Variation with Drain Current

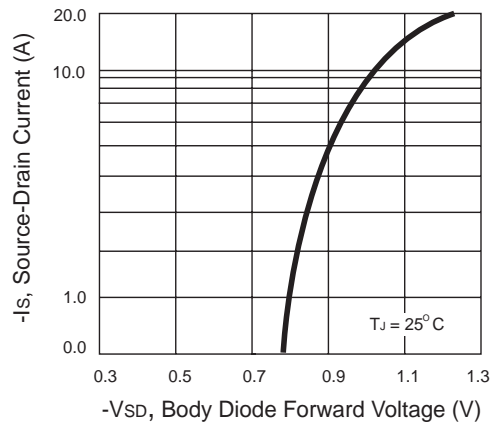


Figure 8. Body Diode Forward Voltage Variation with Source Current

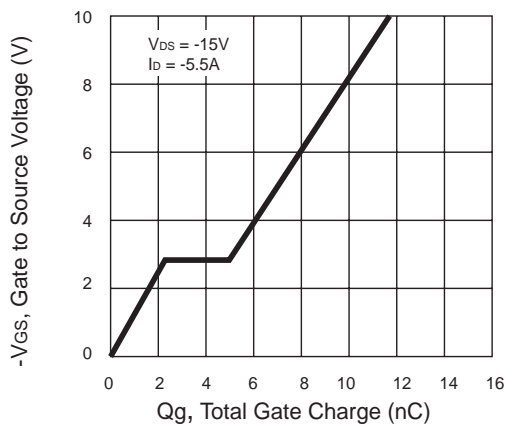


Figure 9. Gate Charge

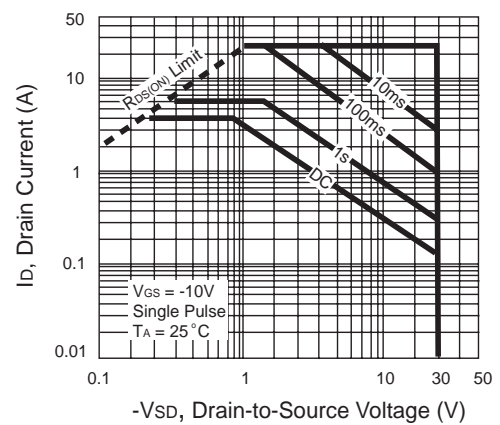


Figure 10. Maximum Safe Operating Area

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

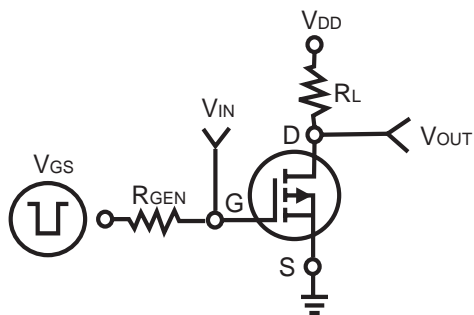


Figure 11. Switching Test Circuit

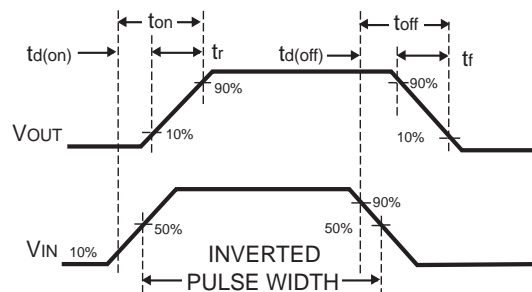


Figure 12. Switching Waveforms

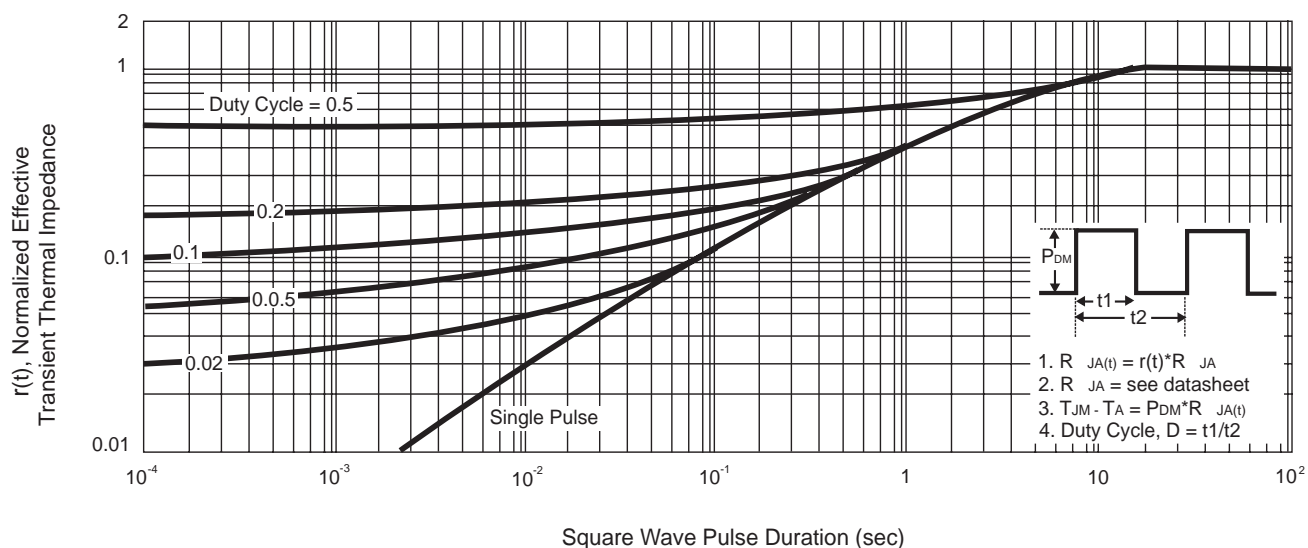
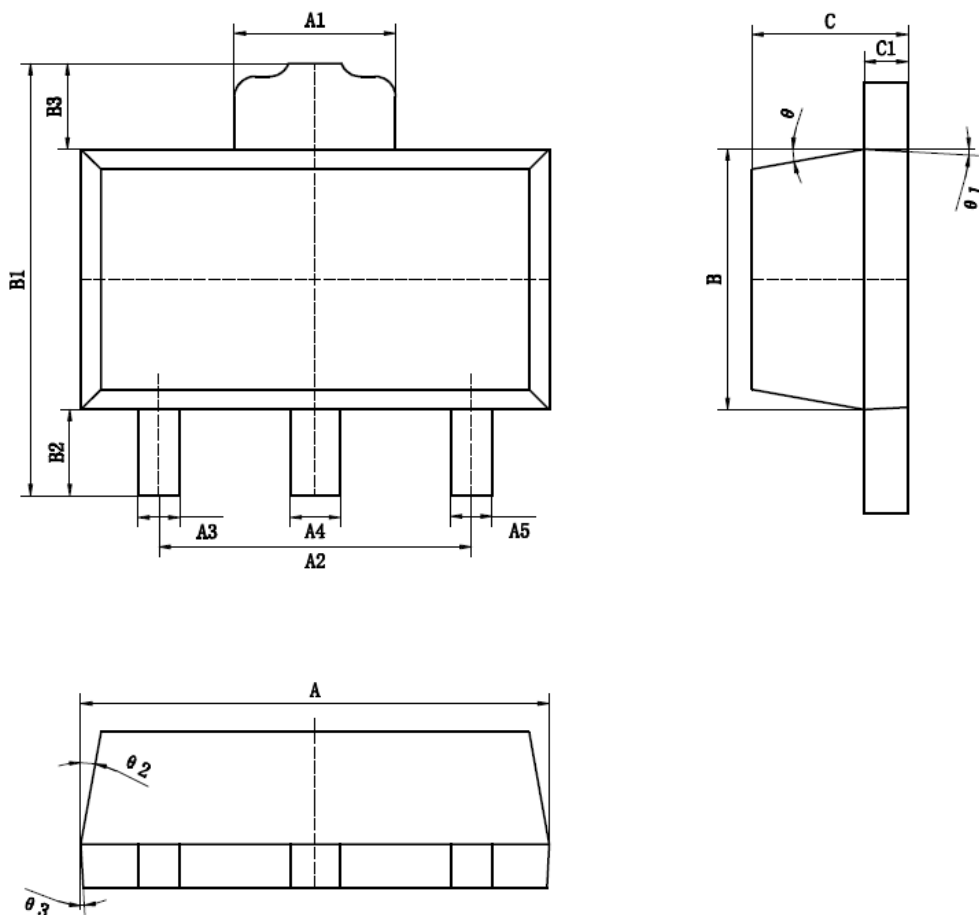


Figure 13. Normalized Thermal Transient Impedance Curve

Package Information

SOT89-3 Package



标注	尺寸	最小(mm)	最大(mm)	标注	尺寸	最小(mm)	最大(mm)
A		4.40	4.60	B3		0.82	0.83
A1		1.65	1.75	C		1.40	1.60
A2		2.95	3.05	C1		0.35	0.45
A3		0.35	0.45	θ		6° TYP4	
A4		0.43	0.53	θ 1		3° TYP4	
A5		0.35	0.45	θ 2		6° TYP4	
B		2.40	2.60	θ 3		3° TYP4	
B1		4.05	4.25				
B2		0.82	0.83				