

General Description :

The HM3401AL uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge and operation with gate voltage as low as 2.5V. It can be used in a wide variety of applications. The package form is SOT23-3L, which accords with the RoHS standard and Halogen Free standard.

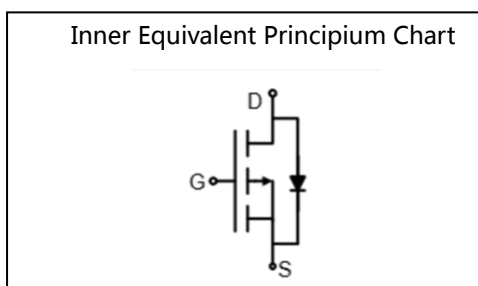
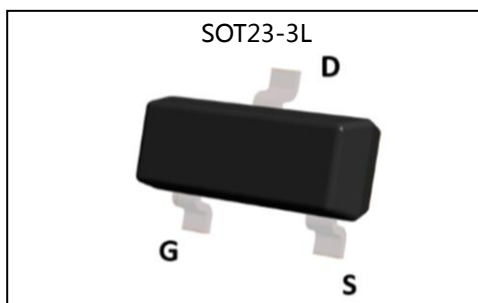
Features :

- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- Low Reverse transfer capacitances

Applications :

- Power switching application
- Hard switched and high frequency circuits
- Power management

V_{DSS}	-30	V
I_D	-4.3	A
P_D	1.5	W
$R_{DS(ON)}$ TYPE	42	mΩ



Package Marking and Ordering Information:

Device Marking	Device	Device Package	Quantity
3401A	HM3401AL	SOT23-3L	3000 units

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise specified) :

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-30	V
I_D	Continuous Drain Current $T_C = 25^\circ\text{C}$	-4.3	A
	Continuous Drain Current $T_C = 70^\circ\text{C}$	-3.0	A
I_{DM}^{a1}	Pulsed Drain Current	-30	A
V_{GS}	Gate-to-Source Voltage	± 12	V
P_D	Power Dissipation	1.5	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150 , -55 to 150	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	300	$^\circ\text{C}$

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

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS} = -30V, V_{GS}= 0V$	--	--	1	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS} = +12V$	--	--	+100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS} = -12V$	--	--	-100	nA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-4.1A$	--	40	52	m Ω
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=-4.5V, I_D=-4.0A$	--	48	65	m Ω
$R_{DS(ON)3}$	Drain-to-Source On-Resistance	$V_{GS}=-2.5V, I_D=-2.0A$	--	75	105	m Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.6	-0.95	-1.3	V

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{FS}	Forward Transconductance	$V_{DS}=-5V, I_D=-4.1A$	5.5	--	--	S
C_{iss}	Input Capacitance	$V_{GS} = 0V$	--	850	--	pF
C_{oss}	Output Capacitance	$V_{DS} = -15V$	--	110	--	
C_{rss}	Reverse Transfer Capacitance	$f = 1.0MHz$	--	70	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D = -4.0A$	--	8.5	--	ns
t_r	Rise Time	$V_{DS} = -15V$	--	4.5	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS} = 10V$	--	26	--	
t_f	Fall Time	$R_G = 3.0\Omega, R_L = 3.6\Omega$	--	12.5	--	
Q_g	Total Gate Charge	$I_D = -4.0A$	--	12.5	--	nC
Q_{gs}	Gate to Source Charge	$V_{DS} = -15V$	--	2.8	--	
Q_{gd}	Gate to Drain ("Miller") Charge	$V_{GS} = -10V$	--	2.7	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current		--	--	-4.1	A
V_{SD}	Diode Forward Voltage	$I_S = -4.1A, V_{GS} = 0V$	--	--	-1.2	V

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient	82	°C/W

^{a1} : Repetitive rating; pulse width limited by maximum junction temperature

■ Typical Performance Characteristics

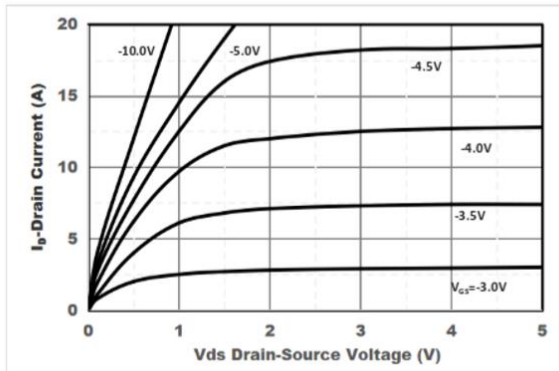


Figure1. Output Characteristics

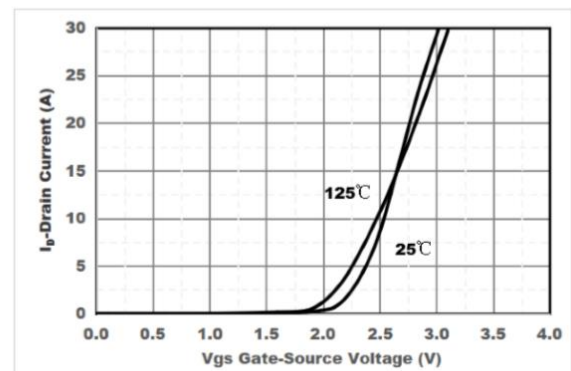


Figure2. Transfer Characteristics

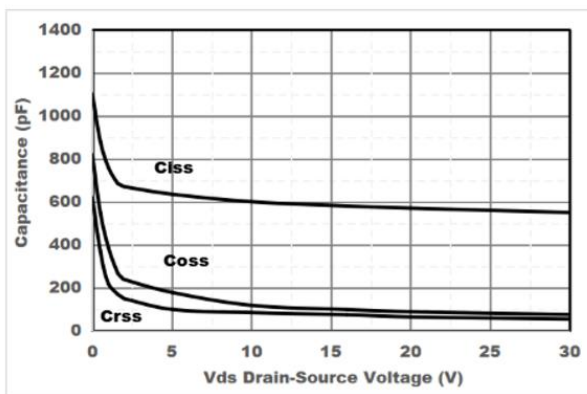


Figure3. Capacitance Characteristics

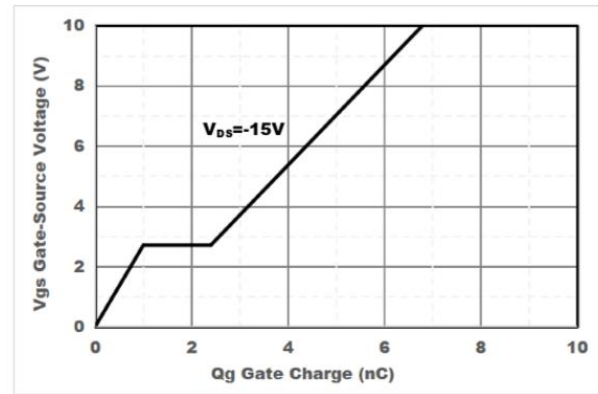


Figure4. Gate Charge

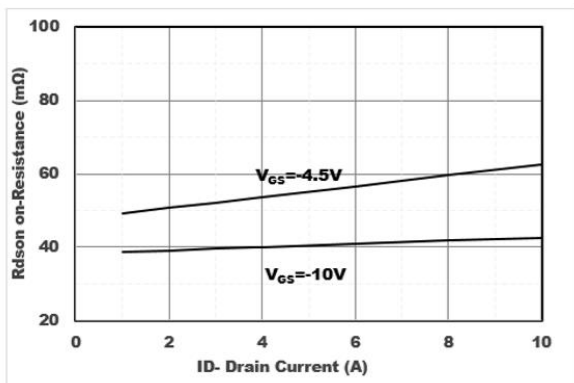


Figure5. Drain-Source on Resistance

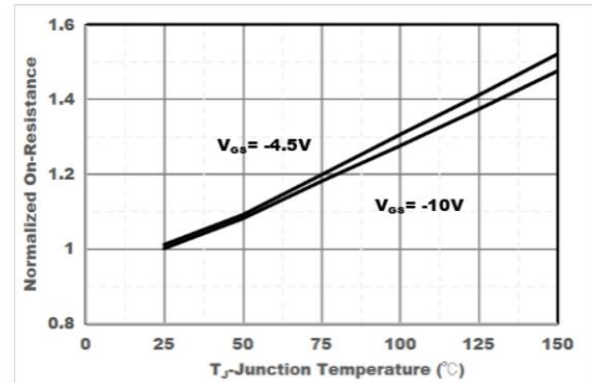


Figure6. Drain-Source on Resistance

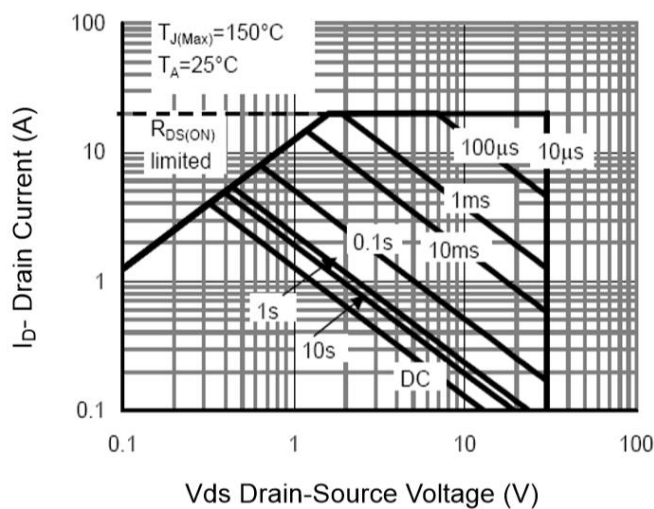


Figure7 Safe Operation Area

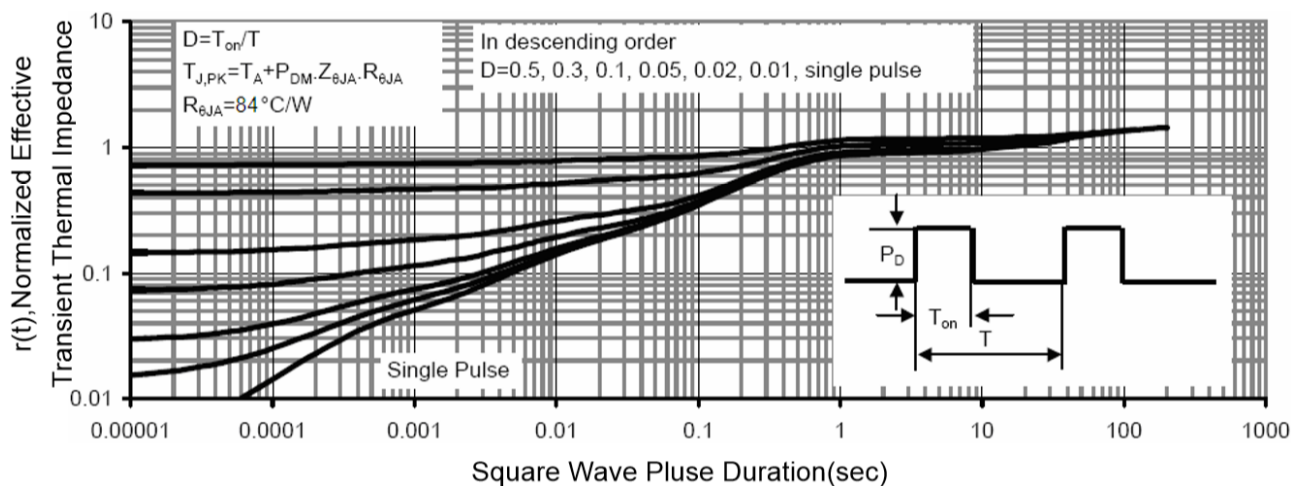
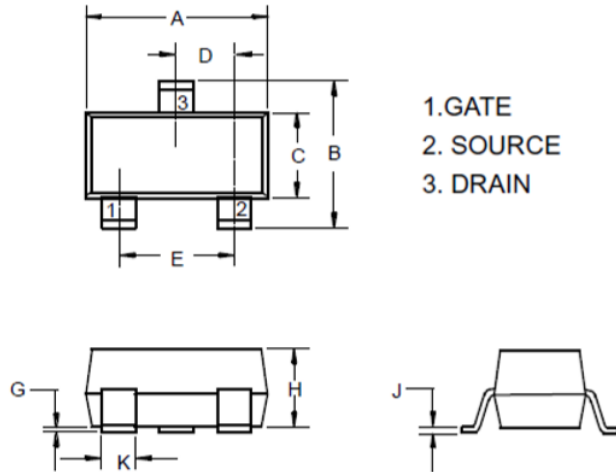


Figure8 Normalized Maximum Transient Thermal Impedance

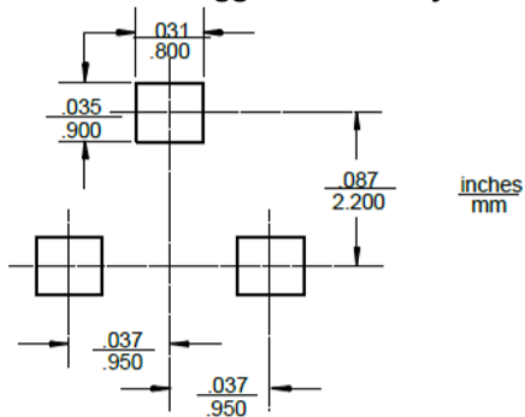
Package Information

SOT-23-3L



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.113	.117	2.87	2.97	
B	.108	.112	2.75	2.85	
C	.061	.065	1.55	1.65	
D	.036	.038	.914	.965	
E	.073	.077	1.85	1.95	
G	.0016	.0039	.04	.100	
H	.044	.049	1.12	1.25	
J	.006	.007	.14	.17	
K	.013	.015	.34	.37	

■ SOT-23-3L Suggested Pad Layout



Revision History

Revision	Date	Descriptions
REV.1.0	Sep, 2017	Initial Version