



## P-Channel MOSFET, -30V, -4.3A, 53mΩ

### General Description

The VAT3401AT utilizes the advanced Trench technology and low resistance package to achieve extremely low on-resistance device which makes the system design an efficient and reliable solution for use in a wide variety of applications.

### Features

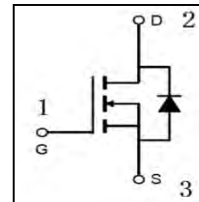
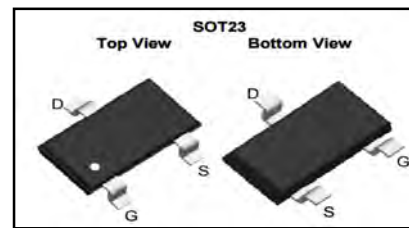
- -30V, -4.3A,  $R_{DS(on)}=53m\Omega@V_{GS}=-10V$
- High Efficiency
- Improved dv/dt, di/dt capability
- 100% EAS Guaranteed
- Green Device

### Application

Mother Board, VGA, SMPS

### Product Summary

$V_{DS}@T_{j,max}$	-30 V
$R_{DS(on)}@V_{GS}=-10V$	53mΩ
$I_D$ Continuous Current	-4.3 A



### Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	Condition
Drain-Source Voltage	$V_{DS}$	-30	V	
Continuous drain current <sup>(1)</sup>	$I_D$	-4.3 -3.6	A	$T_C=25^\circ C$ $T_C=70^\circ C$
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V	Static
Pulsed drain current <sup>(2)</sup>	$I_{DM}$	-20	A	$T_C=25^\circ C$
Power dissipation @ $T_C=25^\circ C$	$P_{diss1}$	1.4	W	$T_C=25^\circ C$
Power dissipation @ $T_C=70^\circ C$	$P_{diss2}$	0.9	W	$T_C=70^\circ C$
Continuous diode forward current	$I_S$	-4.3	A	$T_C=25^\circ C$
Storage Temperature Range	$T_{STG}$	-55 to 150	$^\circ C$	
Operation Junction Temperature Range	$T_J$	-55 to 150	$^\circ C$	

(1) Limited by  $T_{j,max}$ .

(2) Pulse width  $T_p$  limited by  $T_{j,max}$

### Thermal characteristics



Symbol	Parameter	Min	Typ	Max	Unit
$R_{thJA}$	Thermal resistance, junction-ambient, max	---	---	125	°C/W
$T_{sold}$	Soldering temperature, max	---	---	260	°C

## Package and Ordering Information

Device	Package
VAT3401AT	SOT23



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

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
<b>Static Characteristic</b>						
Drain-Source breakdown Voltage	$V_{(BR)DSS}$	-30	---	---	V	$V_{GS}=0\text{V}$ , $I_D=-0.25\text{mA}$
Gate Threshold Voltage	$V_{(GS)th}$	-0.7	-1.0	-1.3	V	$V_{DS}=V_{GS}$ , $I_D=-0.25\text{mA}$
Drain-Source on resistance	$R_{(DS)on}$	---	---	53	m $\Omega$	$V_{GS}=-10\text{V}$ , $I_D=-3\text{A}$ , $T_j=25^{\circ}\text{C}$
		---	---	60	m $\Omega$	$V_{GS}=-4.5\text{V}$ , $I_D=-3\text{A}$ , $T_j=25^{\circ}\text{C}$
		---	---	80	m $\Omega$	$V_{GS}=-2.5\text{V}$ , $I_D=-2\text{A}$ , $T_j=25^{\circ}\text{C}$
Zero gate voltage drain current	$I_{DSS}$	---	---	1	$\mu\text{A}$	$V_{DS}=-24\text{V}$ , $V_{GS}=0\text{V}$ , $T_j=25^{\circ}\text{C}$
Gate-Source leakage current	$I_{GSS}$	---	---	100	nA	$V_{GS}=\pm 12\text{V}$ , $V_{DS}=0\text{V}$
<b>Dynamic Characteristic</b>						
Input Capacitance	$C_{iss}$	---	920	---	pF	$V_{GS}=0\text{V}$ , $V_{DS}=15\text{V}$ , $f=1\text{MHz}$
Output Capacitance	$C_{oss}$	---	73	---	pF	$V_{GS}=0\text{V}$ , $V_{DS}=15\text{V}$ , $f=1\text{MHz}$
Turn-on delay time	$T_{d(on)}$	---	6.6	---	nS	$V_{DD}=15\text{V}$ , $V_{GS}=4.5\text{V}$ , $I_D=3\text{A}$ , $R_G=3.3\Omega$ ; See Figure 8
Rise time	$T_r$	---	27.8	---	nS	
Turn-off delay time	$T_{d(off)}$	---	46.2	---	nS	
Fall time	$T_f$	---	20.6	---	nS	
<b>Gate Charge Characteristic</b>						
Gate to source charge	$Q_{gs}$	---	1.8	---	nC	$V_{DD}=-15\text{V}$ , $I_D=-3\text{A}$ , $V_{GS}=-4.5\text{V}$
Gate to drain charge	$Q_{gd}$	---	3	---	nC	
Gate charge total	$Q_g$	---	11.9	---	nC	
<b>Reverse diode characteristic</b>						
Diode forward voltage	$V_{FD}$	---	---	-1.2	V	$V_{GS}=0\text{V}$ , $I_F=1\text{A}$ , $T_j=25^{\circ}\text{C}$
Continuous Source Current	$I_{csc}$	---	---	-4.3	A	$V_G=V_D=0\text{V}$ , Force current
Pulsed Source Current	$I_{sm}$	---	---	-16	A	



### Electrical Characteristic Diagrams

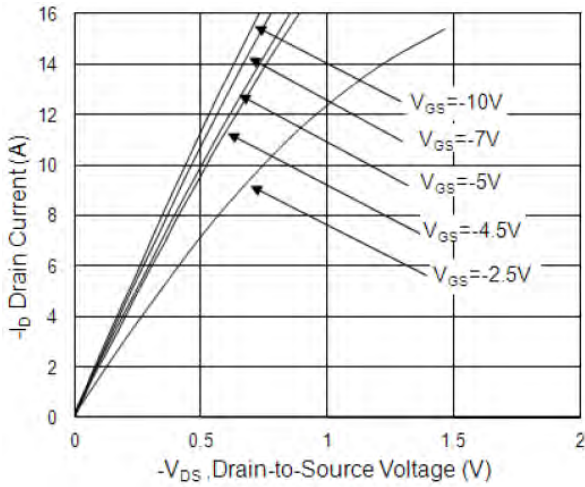


Figure 1 Typical Output Characteristic

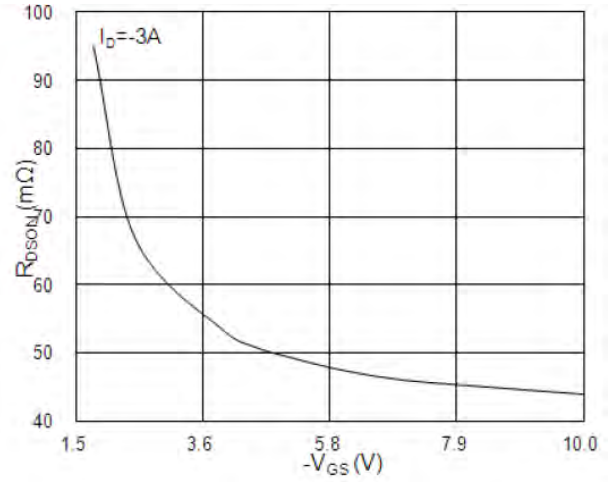


Figure 2 On-Resistance vs. GS voltage

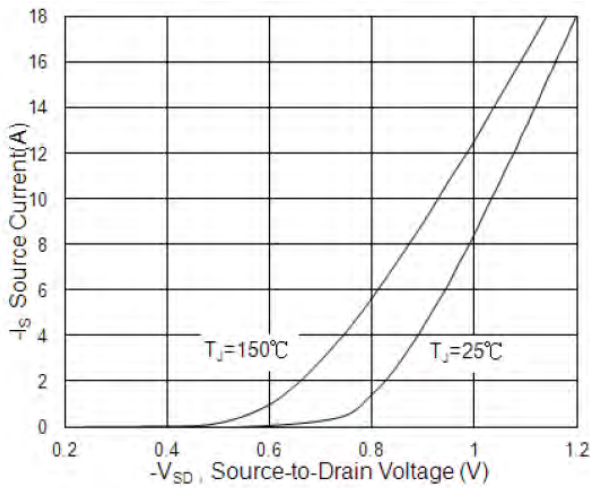


Figure 3 Forward Characteristic of Reverse

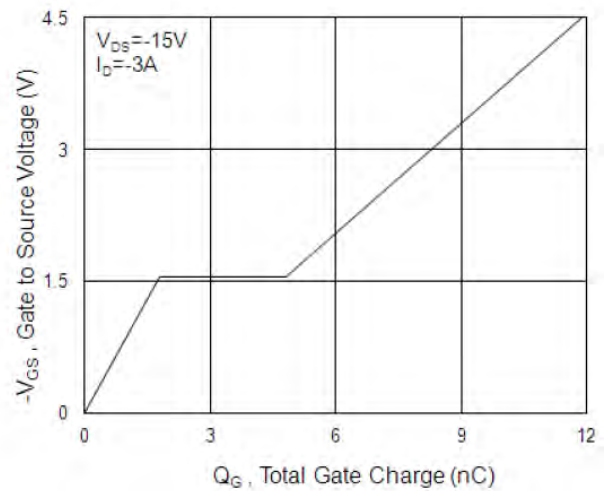


Figure 4 Gate Charge Waveform

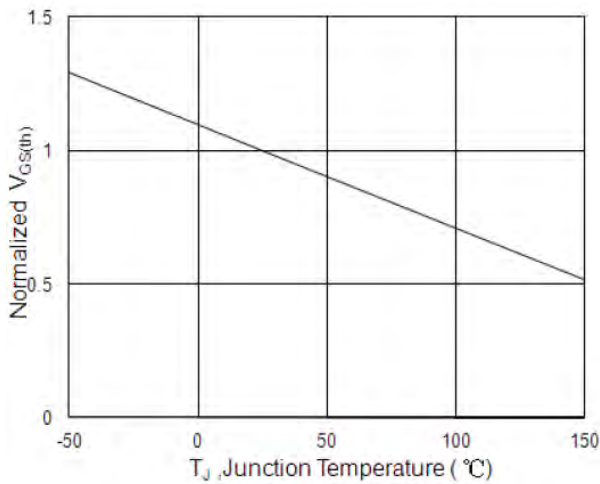


Figure 5 Normalized  $V_{GS(th)}$  vs.  $T_J$

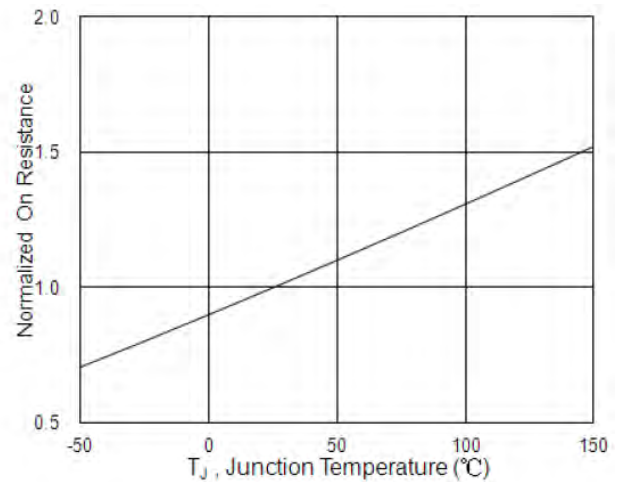


Figure 6 Normalized  $R_{DS(on)}$  vs.  $T_J$

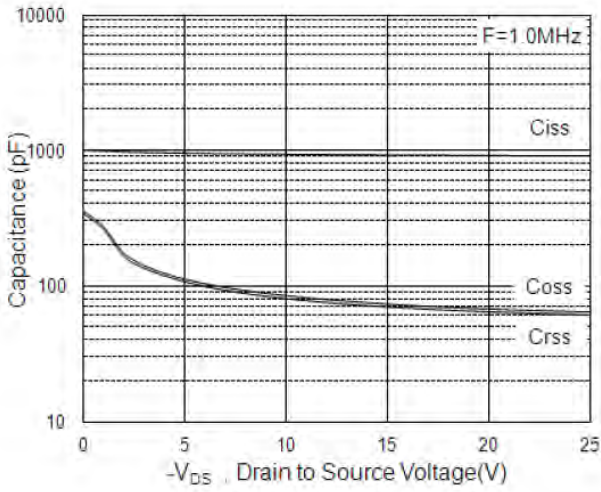


Figure 7 Capacitance Characteristic

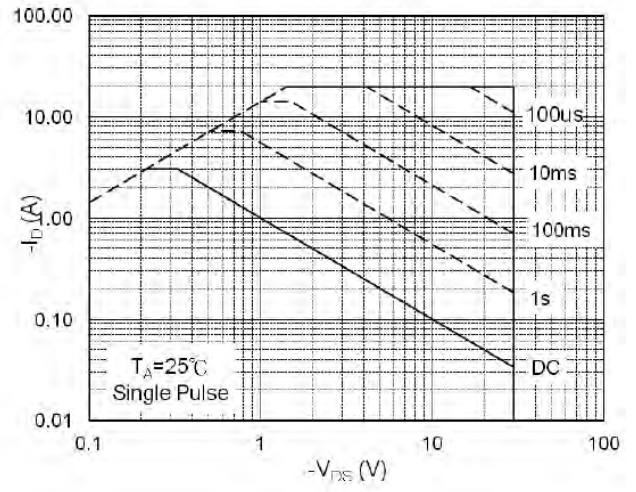


Figure 8 Safe Operating Area

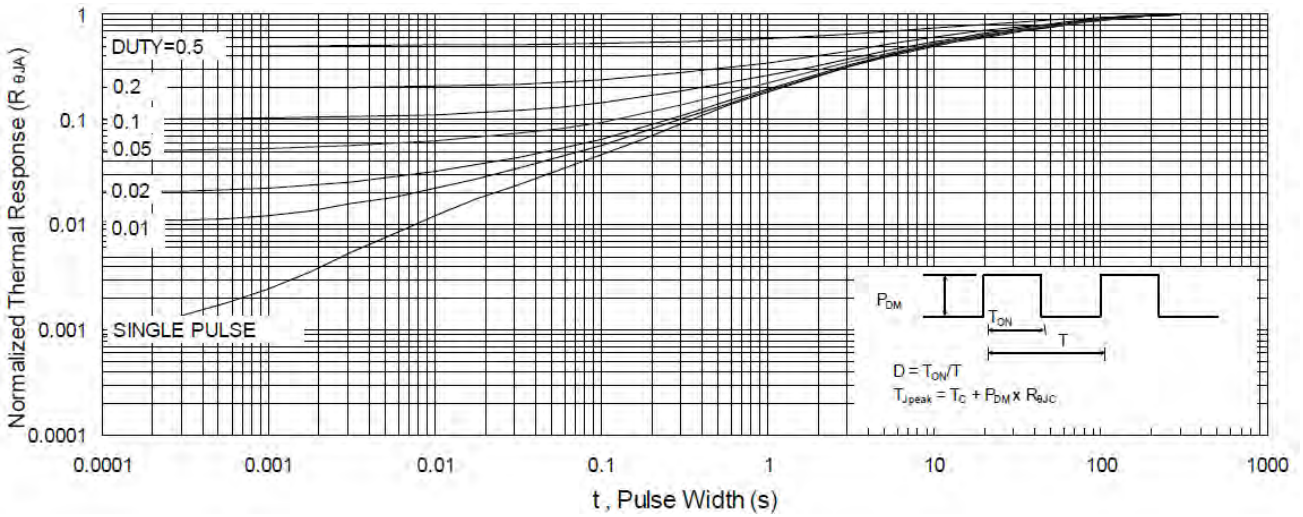


Figure 8 Normalized Maximum Transient Thermal Impedance

Parameter Test Circuits

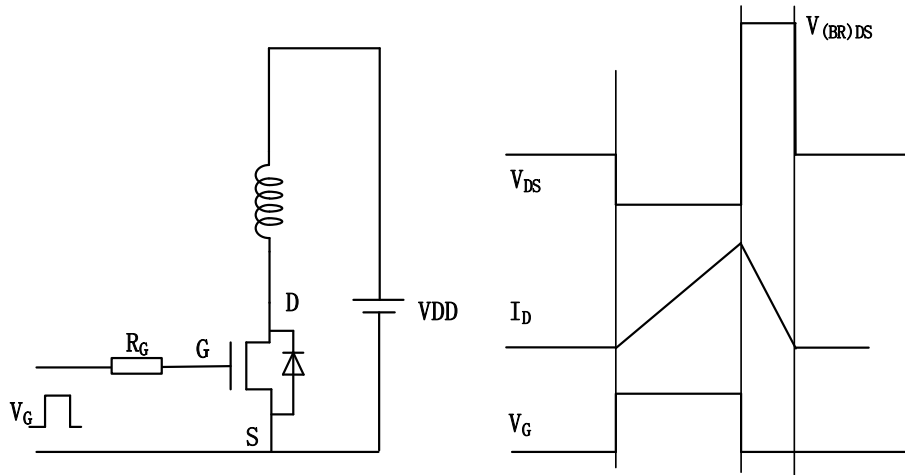


Figure 9 Unclamped Inductive Switching (UIS) Test circuit and waveforms

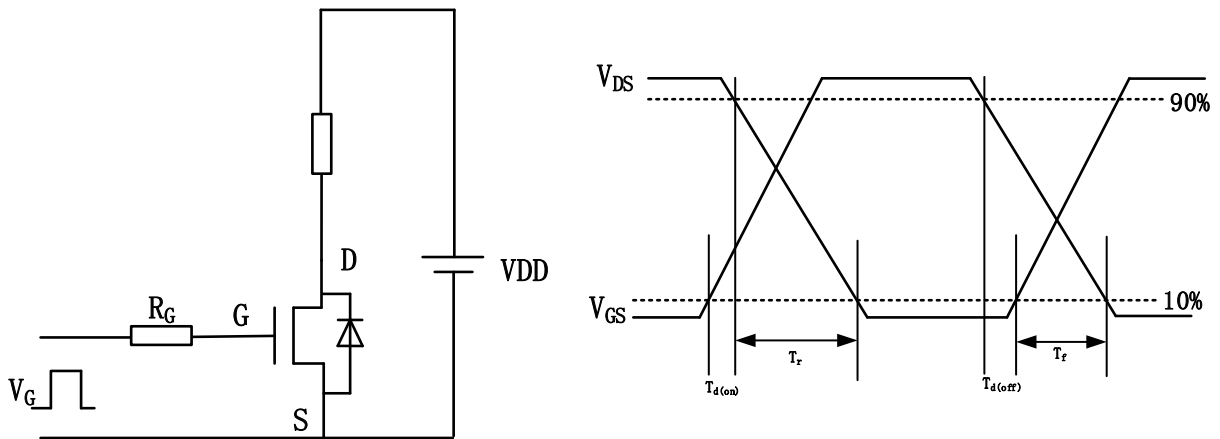


Figure 10 Resistive Switching time Test circuit and waveforms

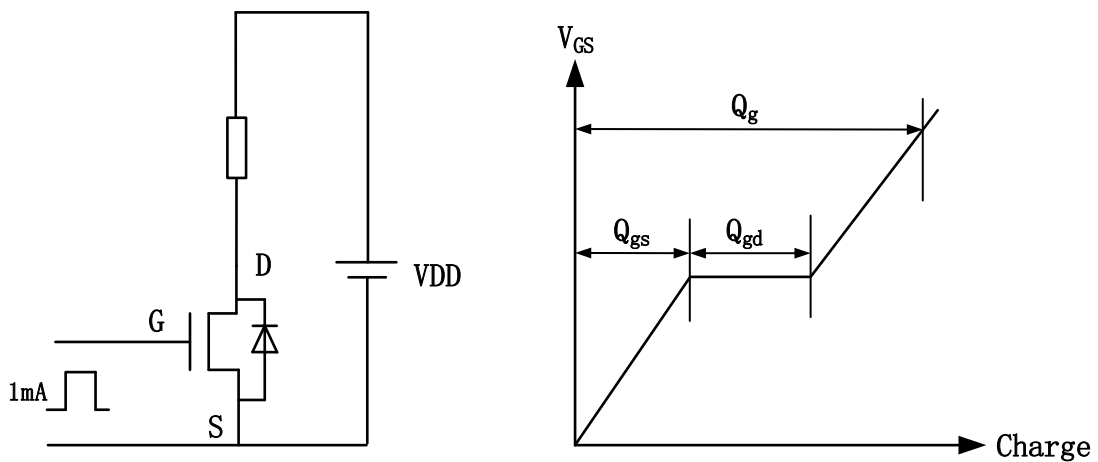
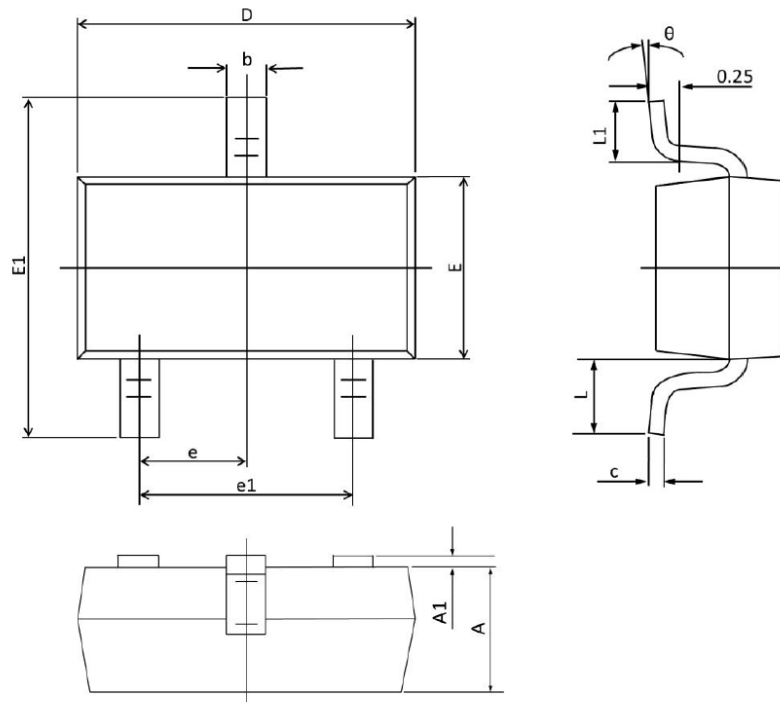


Figure 11 Gate charge Test circuit and waveforms



Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°

单击下面可查看定价，库存，交付和生命周期等信息

[>>Chiplead\(奇力科技\)](#)