



Description

The AO3416A 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 Battery protection or in other Switching application.

General Features

$V_{DS} = 20V$ $I_D = 6.5A$

$R_{DS(ON)} < 27m\Omega @ V_{GS}=4.5V$

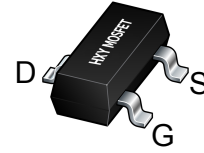
ESD=2500HBM

Application

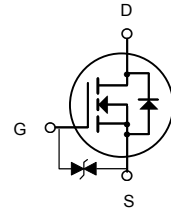
Battery protection

Load switch

Uninterruptible power supply



SOT23-3L



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AO3416A	SOT23-3L	AGBV 1N	3000

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current-Continuous	6.5	A
I_{DM}	Drain Current-Pulsed (Note 1)	30	A
P_D	Maximum Power Dissipation	1.4	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	89	$^\circ C/W$



Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20		-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V	-	-	±10	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.45	0.7	1.0	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =6.5A	-	17	27	mΩ
		V _{GS} =2.5V, I _D =5.5A	-	21	33	mΩ
		V _{GS} =1.8V, I _D =5A	-	28	40	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =6.5A	8	-	-	S
Input Capacitance	C _{ISS}	V _{DS} =10V, V _{GS} =0V, F=1.0MHz	-	660	-	PF
Output Capacitance	C _{OSS}		-	160	-	PF
Reverse Transfer Capacitance	C _{RSS}		-	87	-	PF
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V, R _L =1.5Ω V _{GS} =5V, R _{GEN} =3Ω	-	0.5		nS
Turn-on Rise Time	t _r		-	1		nS
Turn-Off Delay Time	t _{d(off)}		-	12		nS
Turn-Off Fall Time	t _f		-	4		nS
Total Gate Charge	Q _g	V _{DS} =10V, I _D =6.5A, V _{GS} =4.5V	-	8		nC
Gate-Source Charge	Q _{gs}		-	2.5	-	nC
Gate-Drain Charge	Q _{gd}		-	3	-	nC
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =6.5A	-	-	1.2	V
Diode Forward Current ^(Note 2)	I _S		-	-	6.5	A

Notes:

Repetitive Rating: Pulse width limited by maximum junction temperature.

Surface Mounted on FR4 Board, t ≤ 10 sec.

Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

Guaranteed by design, not subject to production



Typical Characteristics

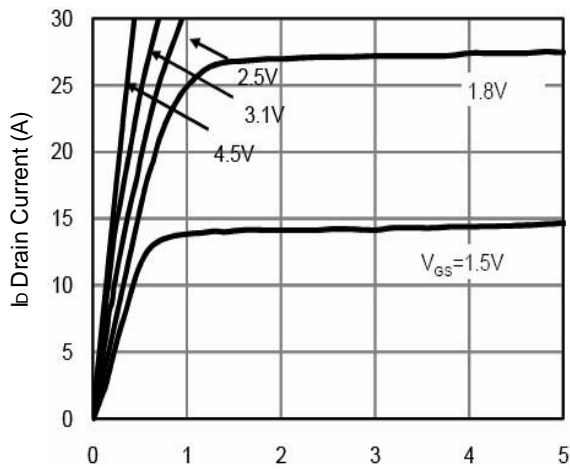


Fig.1 Typical Output Characteristics

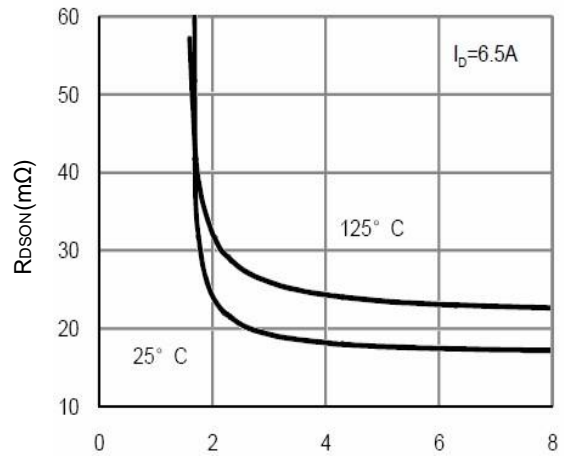


Fig.2 On-Resistance vs. Gate-Source

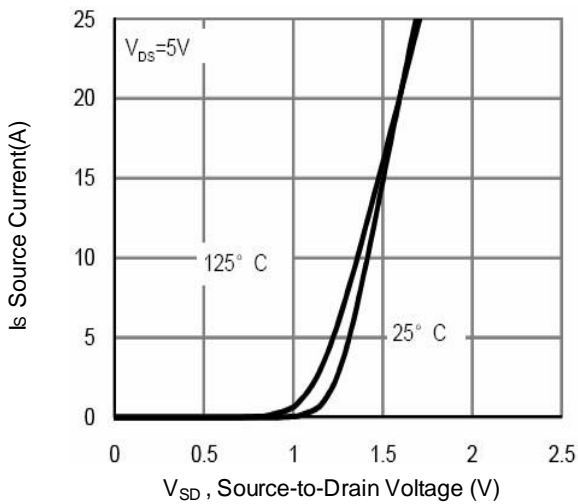


Fig.3 Forward Characteristics of Reverse

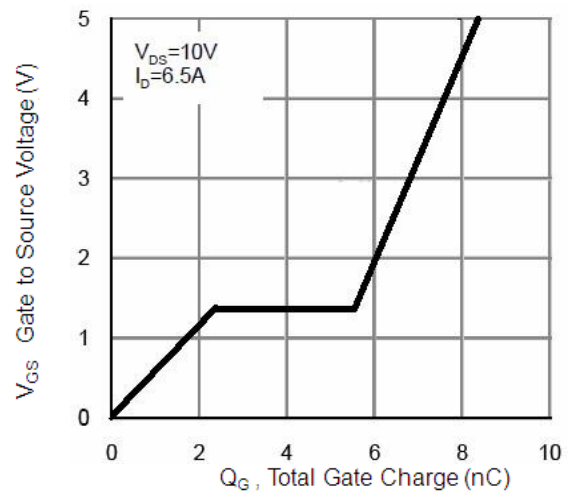


Fig.4 Gate-Charge Characteristics

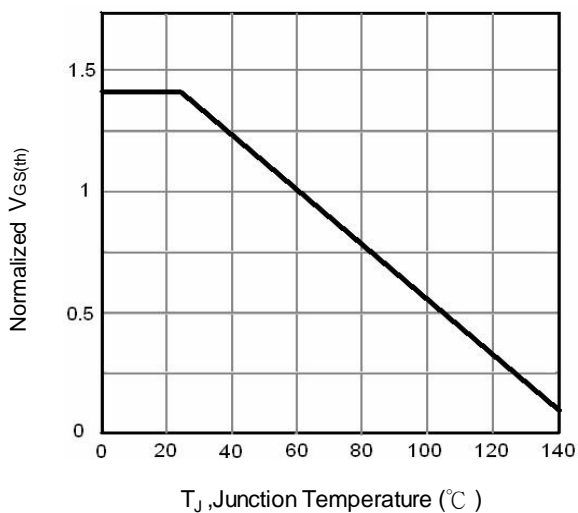


Fig.5 Normalized VGS(th) vs. Tj

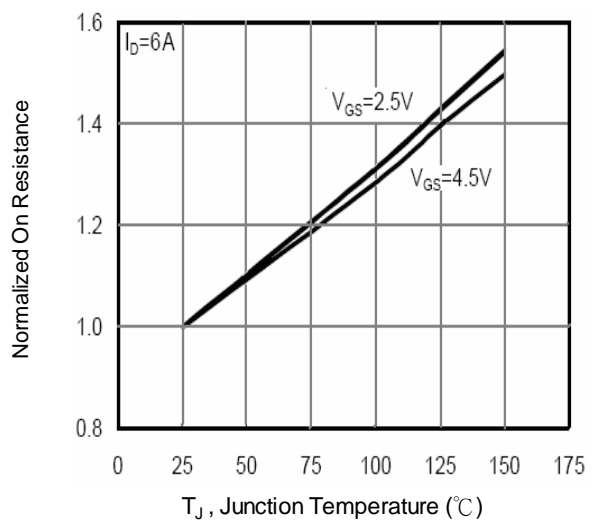


Fig.6 Normalized Rds(on) vs. Tj

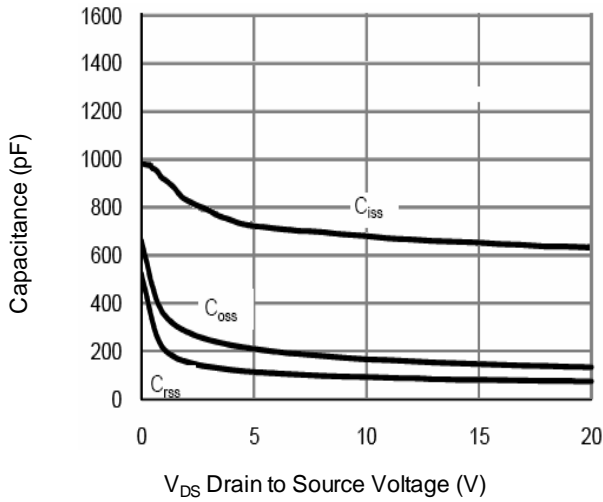


Fig.7 Capacitance

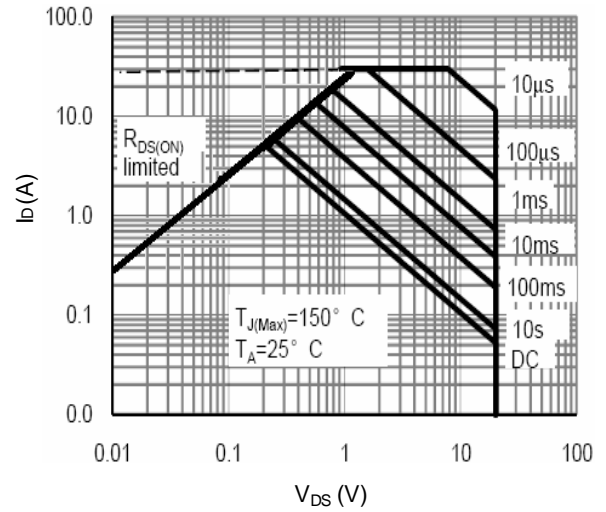


Fig.8 Safe Operating Area

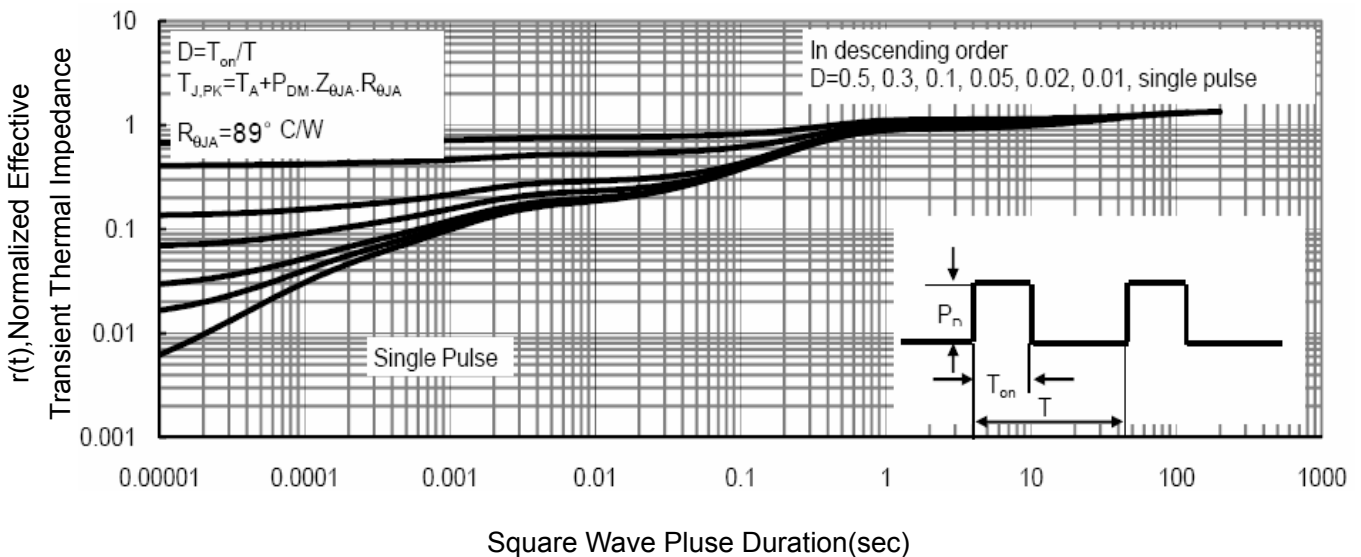


Fig.9 Normalized Maximum Transient Thermal Impedance

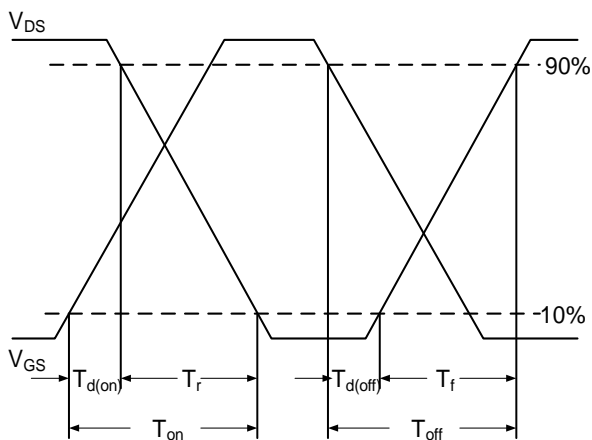


Fig.10 Switching Time Waveform

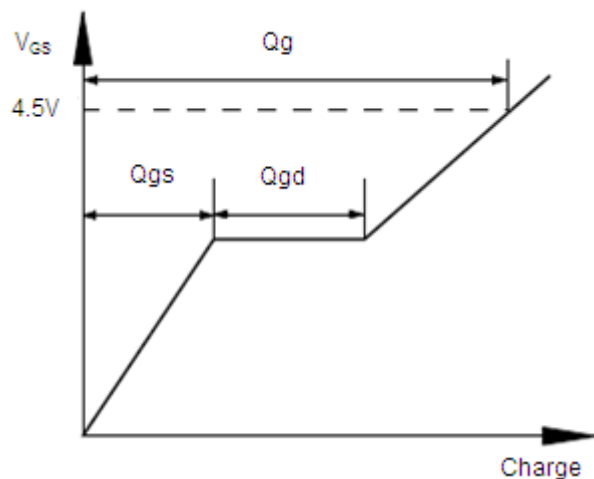
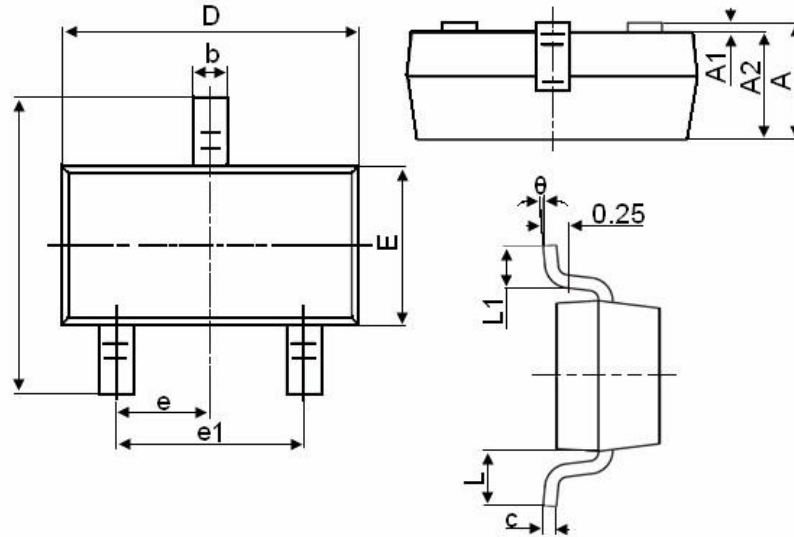


Fig.11 Gate Charge Waveform



SOT23-3L Package Information



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.800	3.000
E	1.500	1.700
E1	2.650	2.950
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.600
θ	0°	8°



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