AS3416AE-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
20V	24mΩ@4.5V	6.5A
	30mΩ@2.5V	
	40mΩ@1.8V	

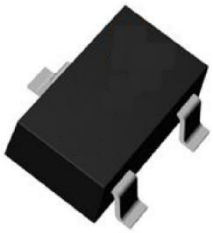
Feature

- Advanced trench process technology
- High density cell design for low on-resistance
- High power and current handing capability
- Suffix"-Q1"for AEC-Q101

Application

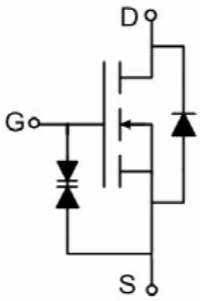
- Load Switch
- PWM Application

Package

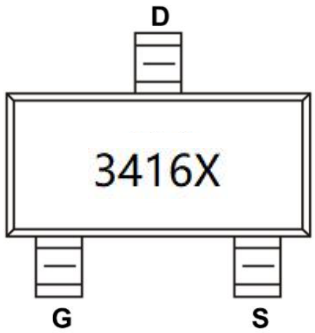


SOT-23

Circuit diagram



Marking



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N-Channel Enhancement Mode MOSFET

Absolute maximum ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current	I_D	6.5	A
Pulsed Drain Current	I_{DM}	30	A
Power Dissipation	P_D	1.4	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	89	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (Ta=25 ºC, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	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		1.0	V
Drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS} =4.5V, I_D =6.5A		19	24	mΩ
		V_{GS} =2.5V, I_D =5.5A		23	30	
		V_{GS} =1.8V, I_D =5A		28	40	
Forward transconductance[1]	g_{FS}	V_{DS} =5V, I_D =6.5A	8			S
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =10V,V_{GS} =0V,f =1MHz		660		pF
Output Capacitance	C_{oss}			160		
Reverse Transfer Capacitance	C_{rss}			87		
Total Gate Charge	Q_g	V_{DS} =10V,V_{GS} =4.5V, I_D =6.5A		8		nC
Gate-Source Charge	Q_{gs}			2.5		
Gate-Drain Charge	Q_{gd}			3		
Turn-on delay time	$t_{d(on)}$	V_{DD}=10V, V_{GS} =5V, R_{GEN}=3Ω,R_L=1.5Ω		0.5		nS
Turn-on rise time	t_r			1		
Turn-off delay time	$t_{d(off)}$			12		
Turn-off fall time	t_f			4		
Source-Drain Diode characteristics						
Diode Forward Current[1]	I_S				6.5	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=6.5A			1.2	V

Notes:

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

2) Guaranteed by design, not subject to production testing.

Typical Characteristics

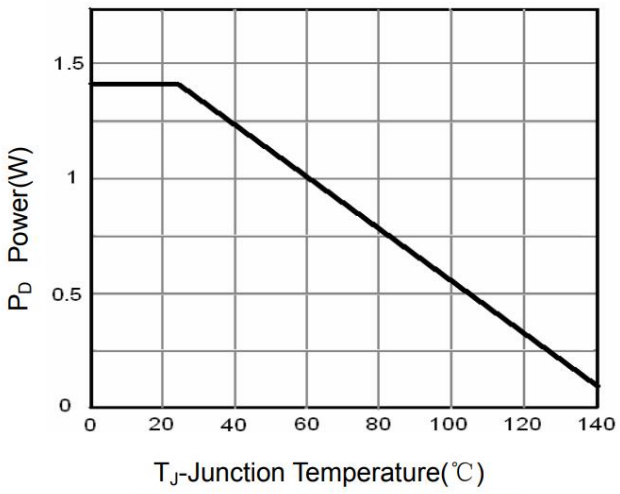


Figure 1 Power Dissipation

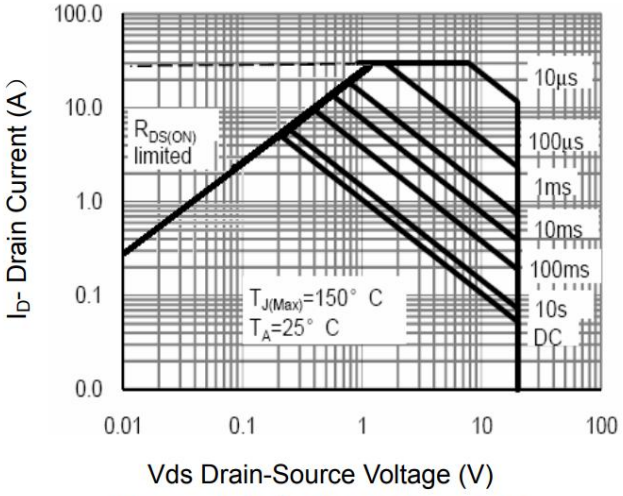


Figure 2 Safe Operation Area

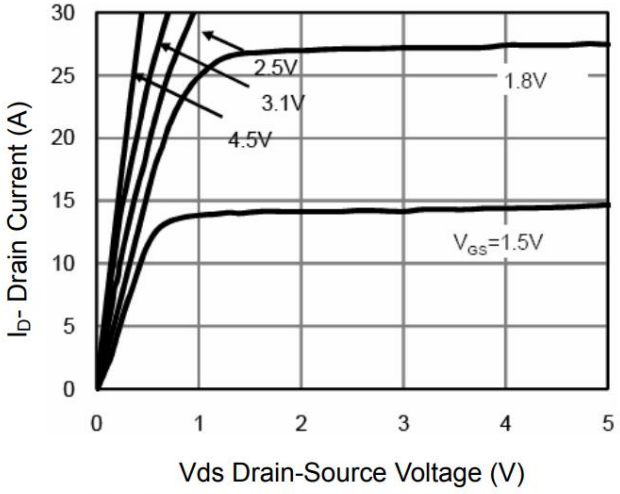


Figure 3 Output Characteristics

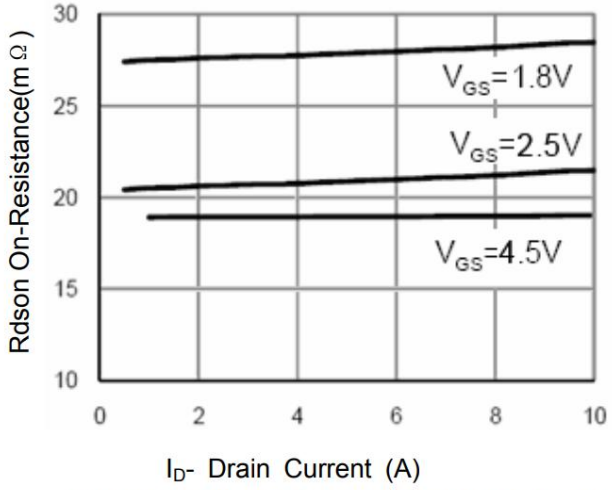


Figure 4 Drain-Source On-Resistance

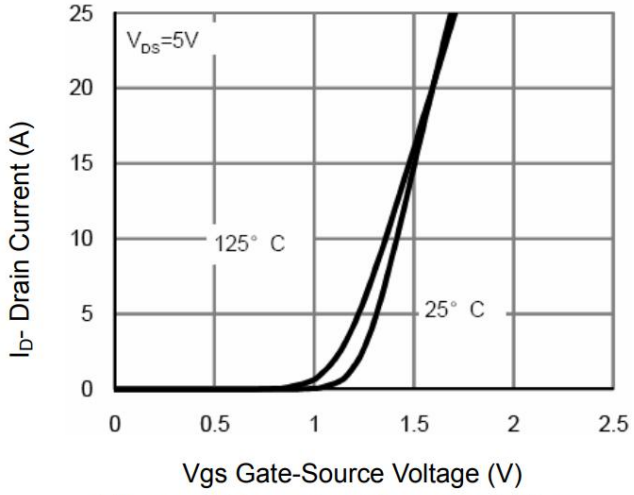


Figure 5 Transfer Characteristics

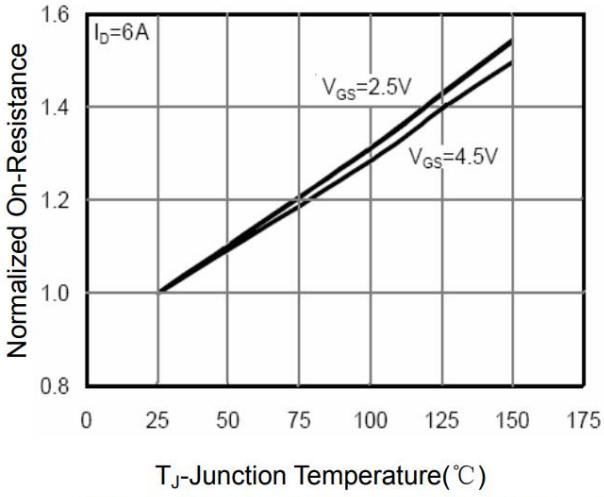


Figure 6 Drain-Source On-Resistance

Typical Characteristics

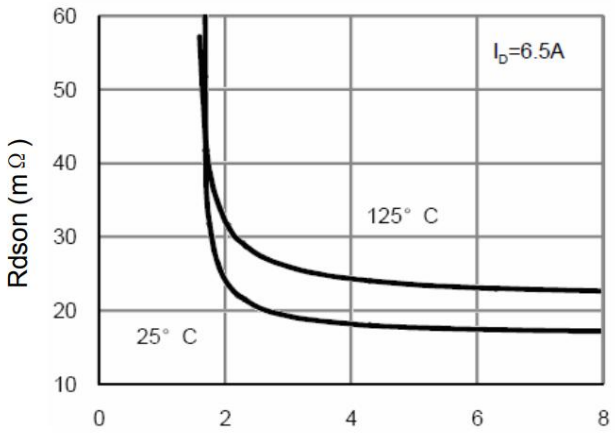


Figure 7 Rdson vs Vgs

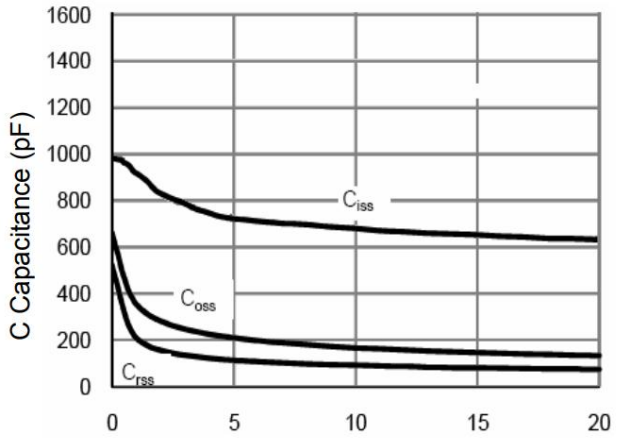


Figure 8 Capacitance vs Vds

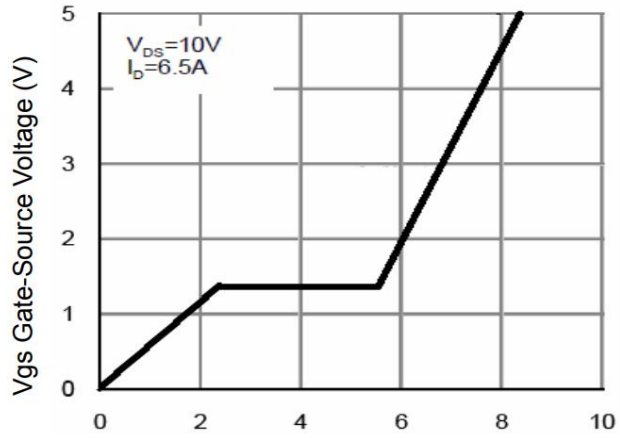


Figure 9 Gate Charge

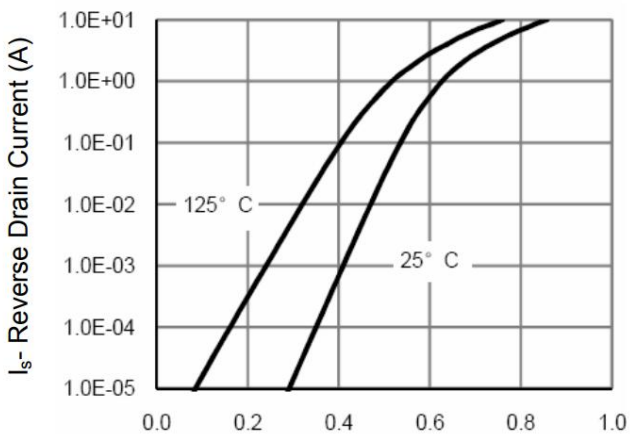


Figure 10 Source- Drain Diode Forward

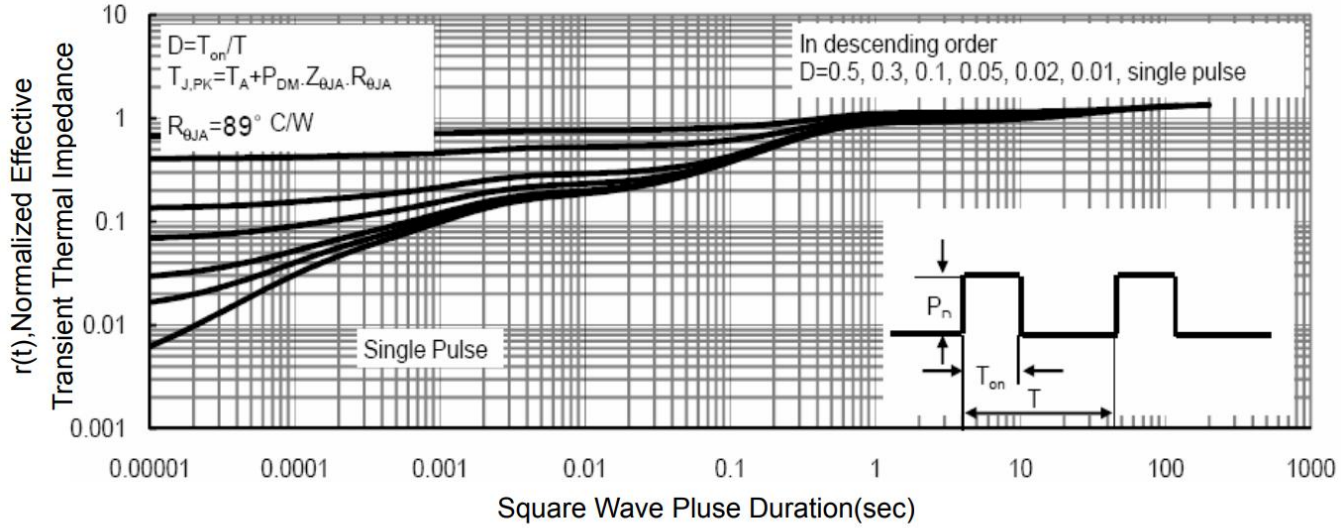
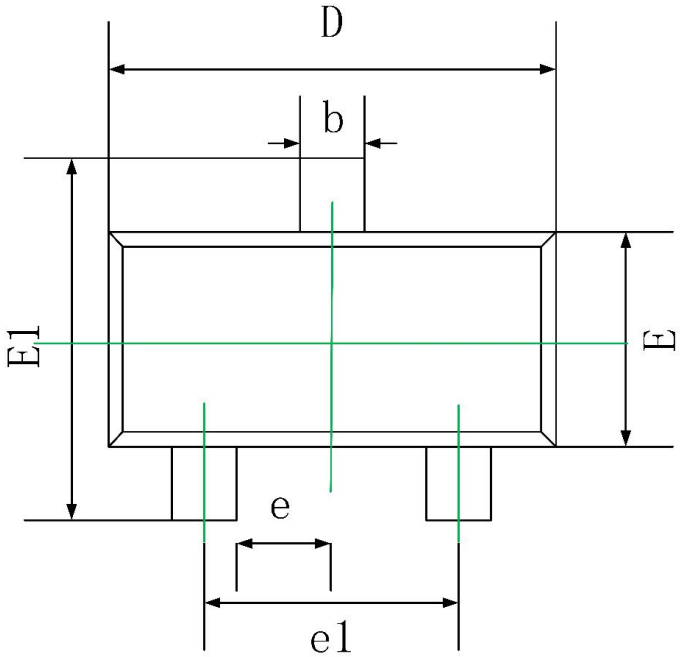
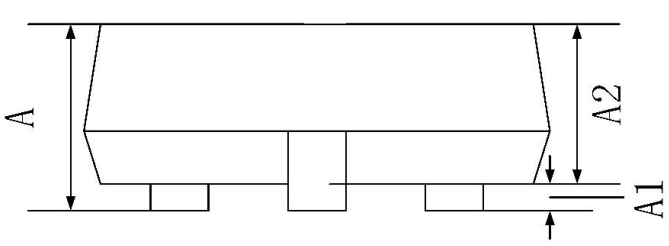
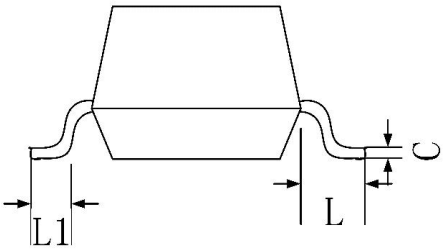


Figure 11 Normalized Maximum Transient Thermal Impedance

SOT-23 Package Information







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.200	0.035	0.047
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
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 BSC.		0.037 BSC.	
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