AU4N65S-Q1

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	1.1Ω@10V	4A

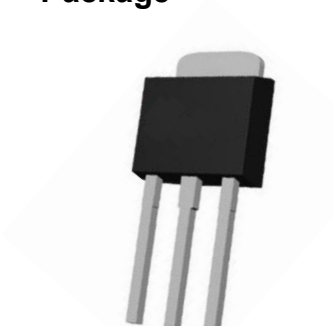
Feature

- Low Crss
- Low gate charge
- Fast switching
- Suffix "-Q1" for AEC-Q101

Application

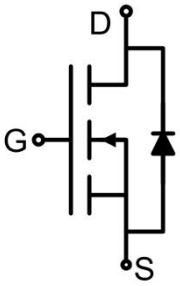
- Power factor correction
- Switched mode power supplies
- Uninterruptible Power Supply

Package



TO-251AB

Circuit diagram



Marking

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	4	A
Pulsed Drain Current	I_{DM}	16	A
Power Dissipation	P_D	41	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	3	℃/W
Single pulse avalanche energy	E_{AS}	27	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=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	650			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =650V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	3		4	V
Drain-source on-resistance[1)]	$R_{DS(on)}$	V_{GS} =10V, I_D =2A		0.95	1.1	Ω
Dynamic characteristics[2)]						
Input Capacitance	C_{iss}	V_{DS} =50V,V_{GS} =0V,f =1MHz		304		pF
Output Capacitance	C_{oss}			18		
Reverse Transfer Capacitance	C_{rss}			0.6		
Total Gate Charge	Q_g	V_{DS} =480V,V_{GS} =10V,ID =4A		8.8		nC
Gate-Source Charge	Q_{gs}			2.3		
Gate-Drain Charge	Q_{gd}			4		
Turn-on delay time	$t_{d(on)}$	V_{DD}=380V, V_{GS} =10V, I_D =2.5A,R_{GEN}=5Ω		8		nS
Turn-on rise time	t_r			4		
Turn-off delay time	$t_{d(off)}$			52		
Turn-off fall time	t_f			9		
Source-Drain Diode characteristics						
Diode Forward Current[1)]	I_S				4	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=4A			1.2	V
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF =2A di/dt = 100A/μs [1)]		200		nS
Reverse Recovery Charge	Q_{rr}			0.6		μC

Notes:

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

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

Typical Characteristics

Figure1. Safe operating area

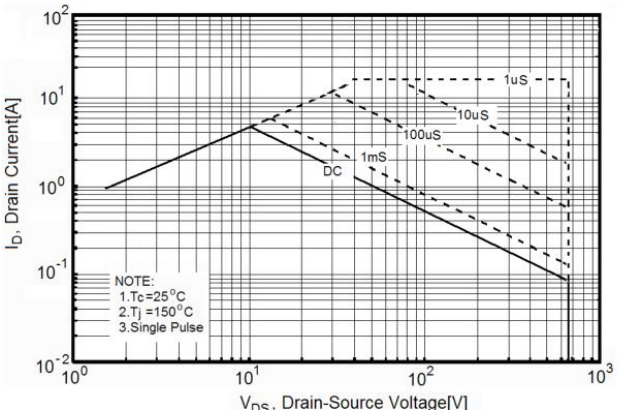


Figure2. Source-Drain Diode Forward Voltage

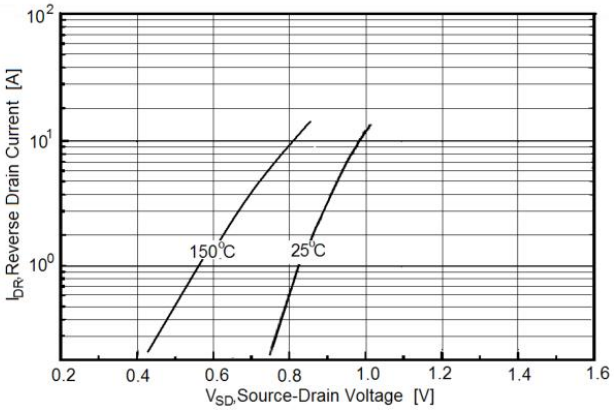


Figure3. Output characteristics

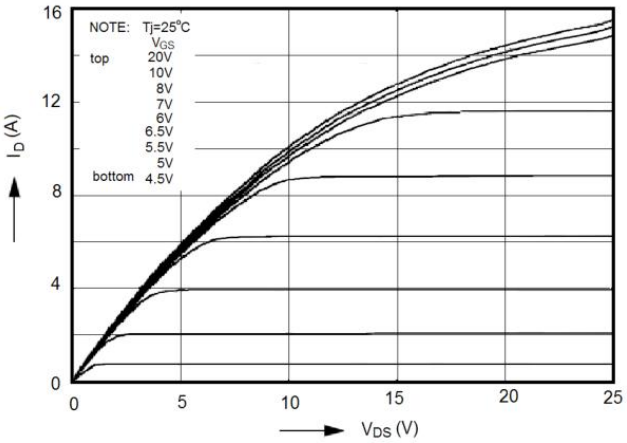


Figure4. Transfer characteristics

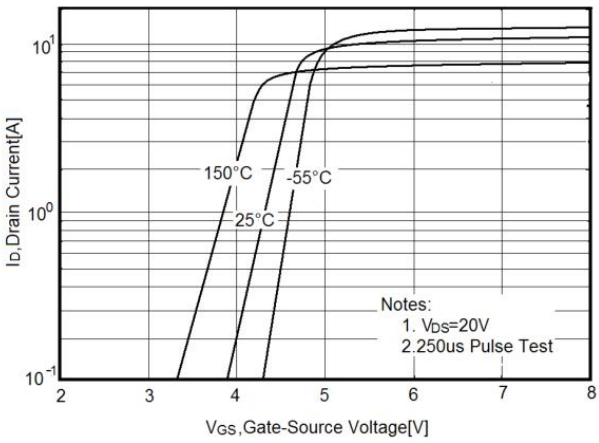


Figure5. Static drain-source on resistance

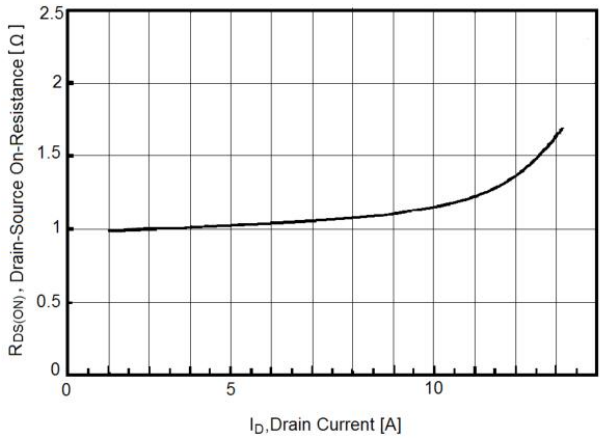
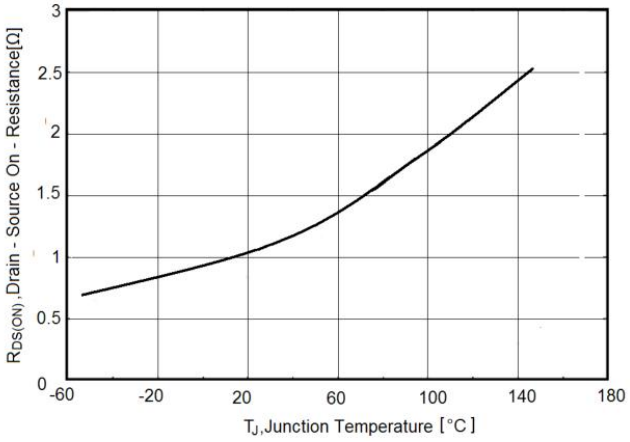


Figure6. $R_{DS(ON)}$ vs Junction Temperature



Typical Characteristics

Figure7. BV_{DSS} vs Junction Temperature

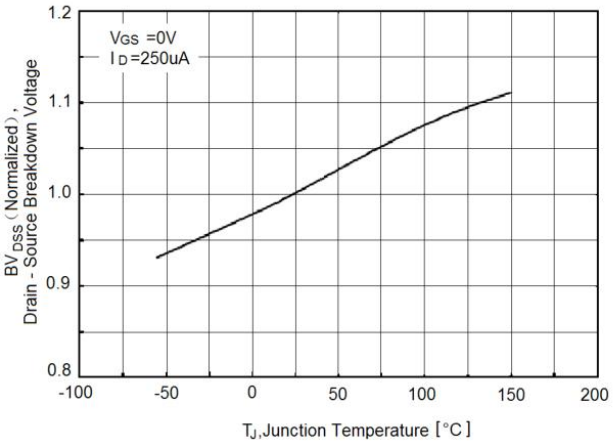


Figure8. Maximum I_D vs Junction Temperature

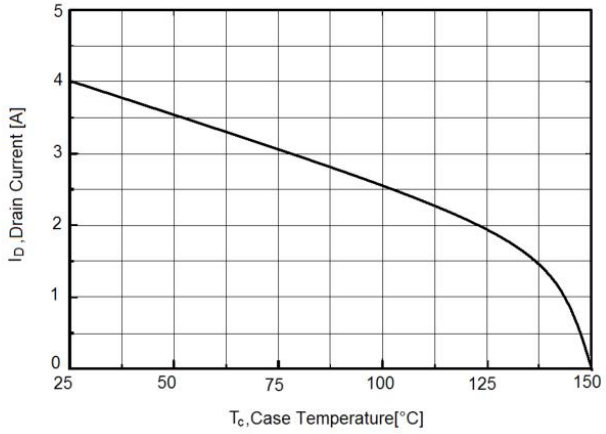


Figure9. Gate charge waveforms

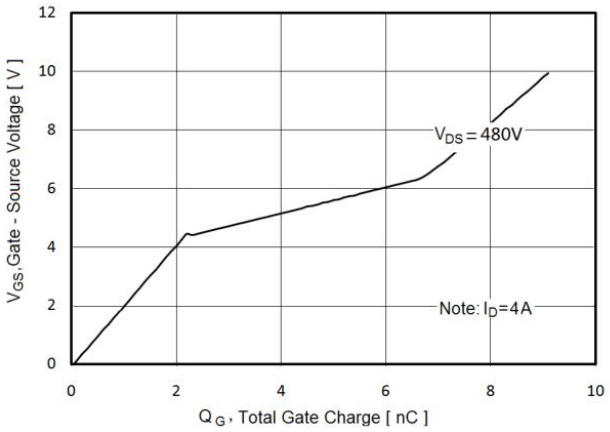


Figure10. Capacitance

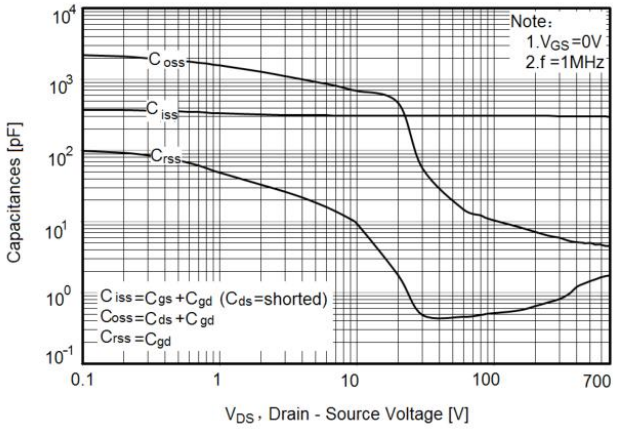
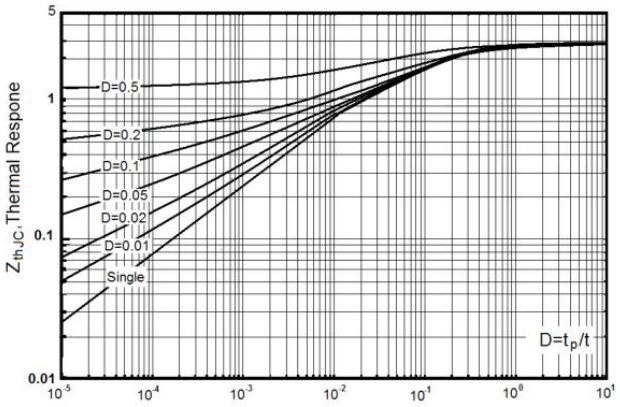


Figure11. Transient Thermal Impedance



TO-251AB Package Information

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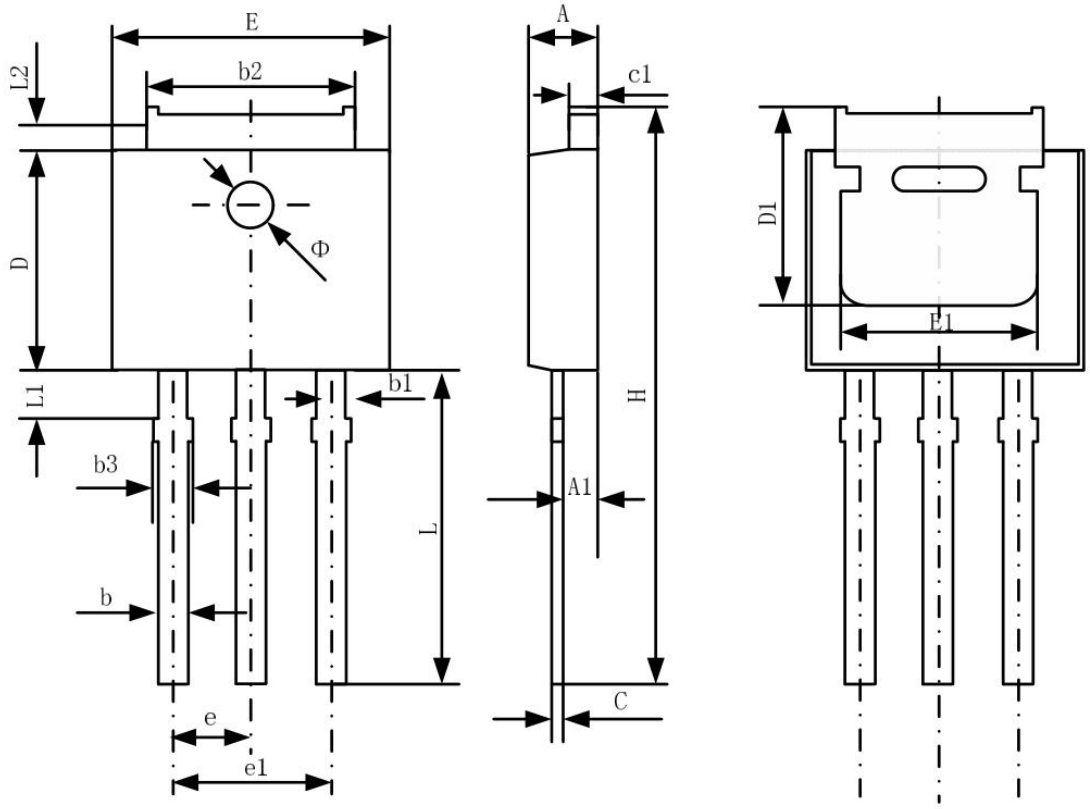

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.35	0.087	0.093
A1	0.90	1.10	0.035	0.043
b	0.56	0.69	0.022	0.027
b1	0.77	0.90	0.030	0.035
b2	5.23	5.43	0.206	0.214
b3		1.05	0.000	0.041
C	0.46	0.59	0.018	0.023
c1	0.46	0.59	0.018	0.023
D	6.00	6.20	0.236	0.244
D1	5.20		0.205	
E	6.50	6.70	0.256	0.264
E1	4.60	5.00	0.181	
e	2.24	2.34	0.088	0.092
e1	4.47	4.67	0.176	0.184
H	16.18	16.78	0.637	0.661
L	9.00	9.60	0.354	0.378
L1	0.95	1.35	0.037	0.053
L2	0.90	1.25	0.035	0.049