AS6012BS-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	8.5mΩ@10V	12A
	12mΩ@4.5V	

Feature

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low RDS(ON)
- Suffix "-Q1" for AEC-Q101

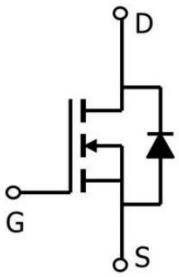
Application

- DC-DC Converters
- Power management functions
- Industrial and Motor Drive application

Package

SOP-8

Circuit diagram



Marking

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	12	A
Continuous Drain Current(T_A=100℃)	I_D	7.5	A
Pulsed Drain Current[1]	I_{DM}	48	A
Power Dissipation[3]	P_D	3.1	W
Thermal Resistance from Junction to Ambient[4]	$R_{\theta JA}$	40	℃/W
Avalanche energy[2]	E_{AS}	132	mJ
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=25 °C, 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	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =60V,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	1.2	1.7	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =12A		6.8	8.5	mΩ
		V_{GS} =4.5V, I_D =10A		8.3	12	
Dynamic characteristics[5]						
Input Capacitance	C_{iss}	V_{DS} =35V,V_{GS} =0V,f =1MHz		2000		pF
Output Capacitance	C_{oss}			390		
Reverse Transfer Capacitance	C_{rss}			13		
Total Gate Charge	Q_g	V_{DS} =30V,V_{GS} =10V,I_D =12A		34		nC
Gate-Source Charge	Q_{gs}			7.8		
Gate-Drain Charge	Q_{gd}			5.2		
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V,V_{GS}=10V, I_D =12A R_{GEN}=3Ω		10		nS
Turn-on rise time	t_r			36		
Turn-off delay time	$t_{d(off)}$			30		
Turn-off fall time	t_f			57		
Source-Drain Diode characteristics						
Body-Diode Continuous Current	I_S				12	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=12A			1.3	V
Reverse Recovery Charge	Q_{rr}	I_F=12A, di/dt=200A/us		36		nC
Reverse Recovery Time	t_{rr}			27		nS

Notes:

1) Repetitive rating; pulse width limited by max. junction temperature.

2) V_{DD}=50V, R_G=25Ω, L=0.5mH, I_{AS}=23A.

3) Pd is based on max. junction temperature, using ≤10s junction-ambient thermal resistance.

4) The value of RθJA is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The Power dissipation PDSM is based on RθJA t≤10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

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

Typical Characteristics

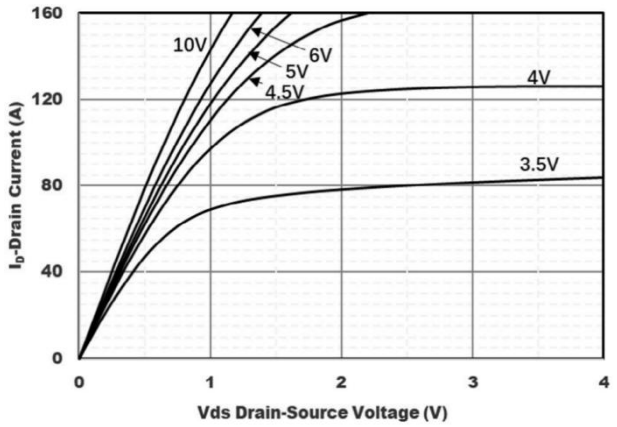


Figure1. Output Characteristics

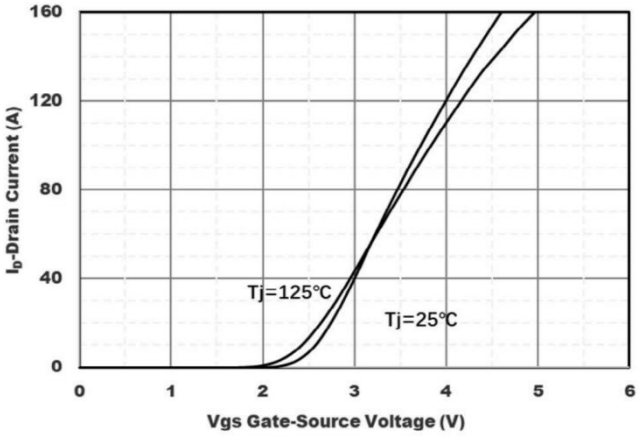


Figure2. Transfer Characteristics

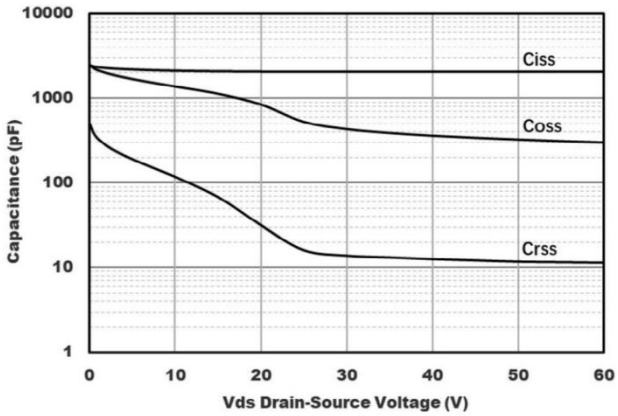


Figure3. Capacitance Characteristics

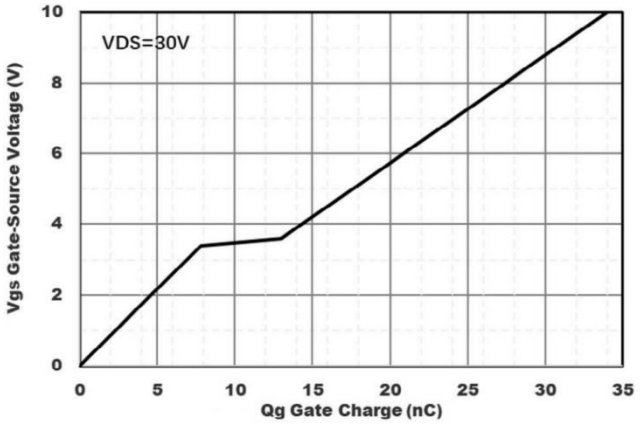


Figure4. Gate Charge

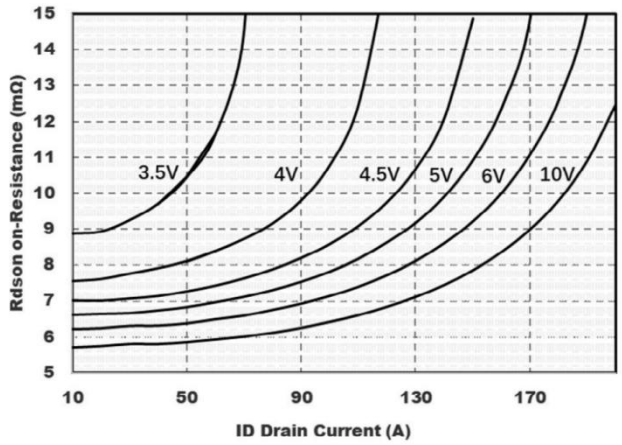


Figure5. Drain-Source on Resistance

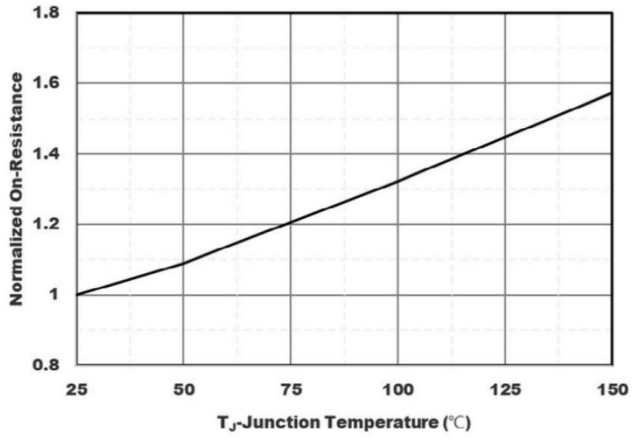


Figure6. Normalized On-Resistance

Typical Characteristics

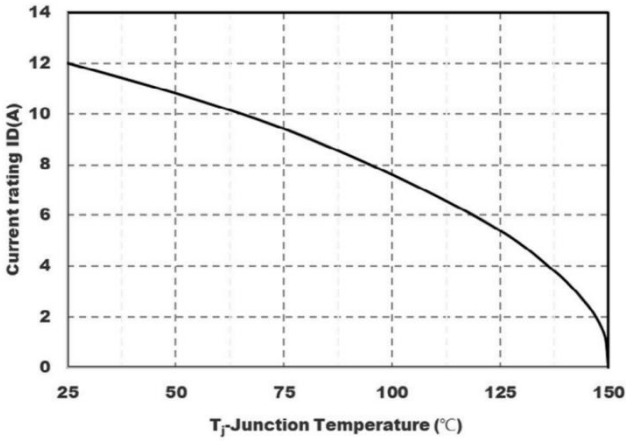


Figure7. Drain current

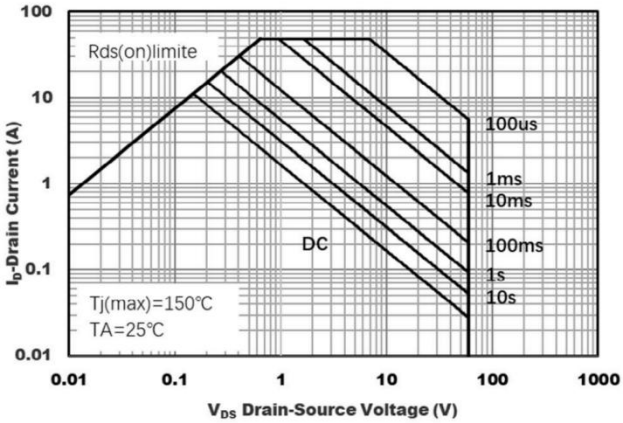


Figure8. Safe Operation Area

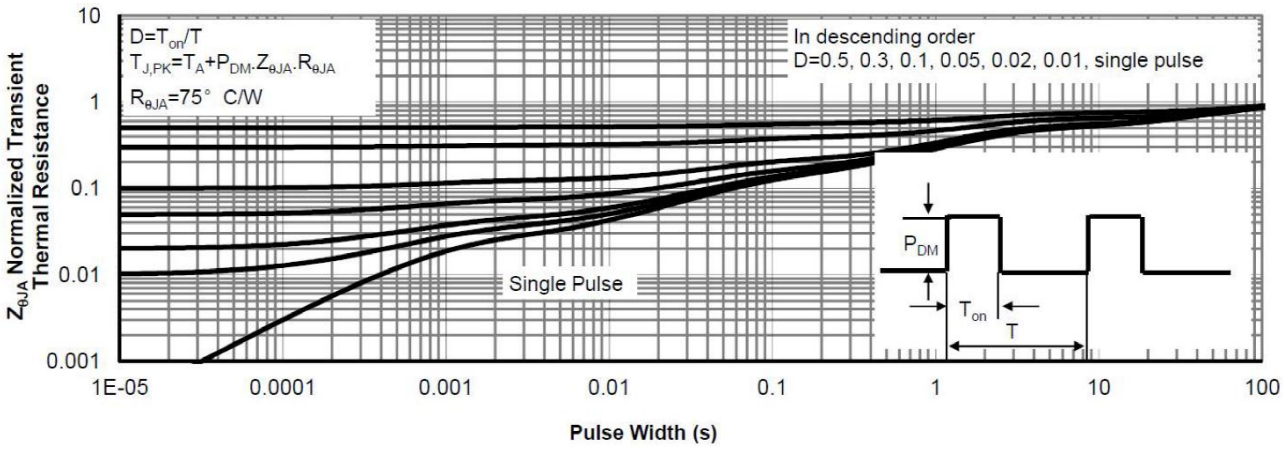
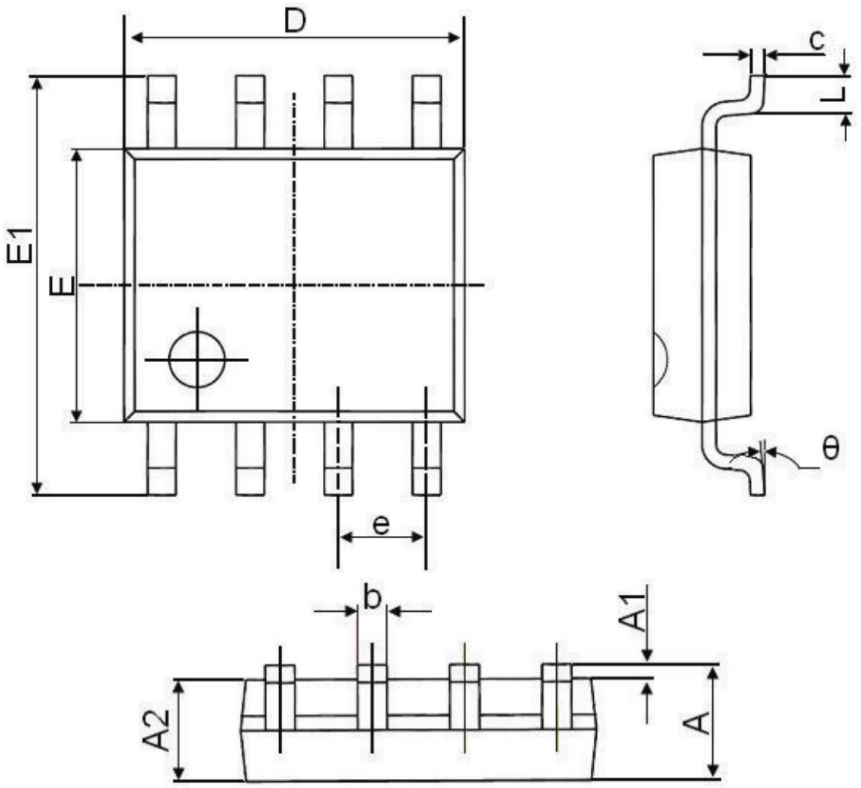


Figure9. Normalized Maximum Transient Thermal Impedance

SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 BSC.		0.050 BSC.	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°