Product Summary

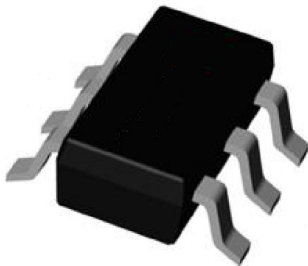| $V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	120mΩ@-10V	-4A
	170mΩ@-4.5V	

Feature

- High density cell design for ultra low on-resistance
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation
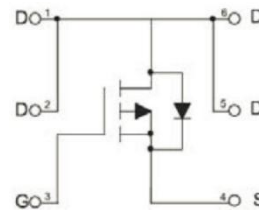- Suffix"-Q1"for AEC-Q101

Application

- Load Switch for Portable Devices
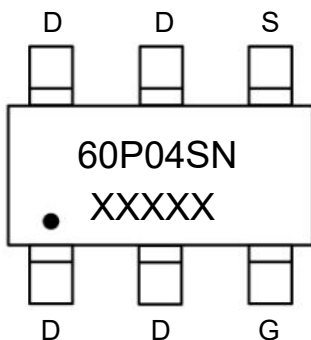- PWM application

Package

SOT-23-6L

Circuit diagram

Marking

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AS6004M-Q1

P-Channel Enhancement Mode MOSFET

Absolute maximum ratings (Ta=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	-4	A
Pulsed Drain Current	I_{DM}	-12	A
Power Dissipation	P_D	1.5	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	83.3	℃/ W
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	-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	-1.0		-2.5	V
Drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS} =-10V, I_D =-4A		106	120	mΩ
		V_{GS} =-4.5V, I_D =-3A		135	170	
Forward transconductance[1]	g_{FS}	V_{DS} =-5V, I_D =-4A		10		S
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =-30V, V_{GS} =0V, f =1MHz		930		pF
Output Capacitance	C_{oss}			85		
Reverse Transfer Capacitance	C_{rss}			35		
Total Gate Charge	Q_g	V_{DS} =-30V, V_{GS} =-10V, I_D =-4A		25		nC
Gate-Source Charge	Q_{gs}			3		
Gate-Drain Charge	Q_{gd}			7		
Turn-on delay time	$t_{d(on)}$	V_{DS}=-30V, V_{GS}=-10V, R_L =7.5Ω, R_{GEN}=3Ω		8		nS
Turn-on rise time	t_r			4		
Turn-off delay time	$t_{d(off)}$			32		
Turn-off fall time	t_f			7		
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}	T_J = 25°C, I_F = -4A di/dt = 100A/μs [1]		25		nS
Reverse Recovery Charge	Q_{rr}			31		nC

Notes:

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

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

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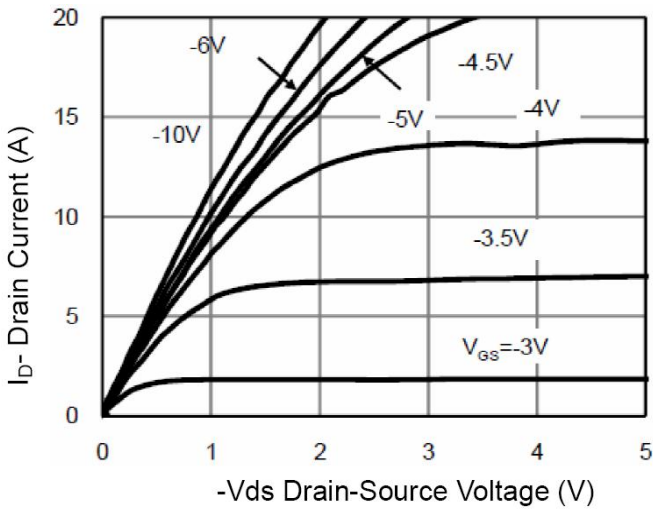INNOVATOR IN SEMICONDUCTOR

Typical Characteristics

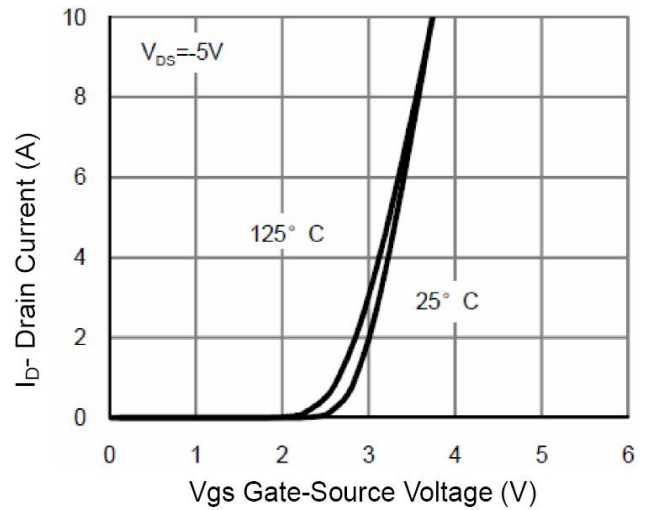**Figure 1 Output Characteristics**

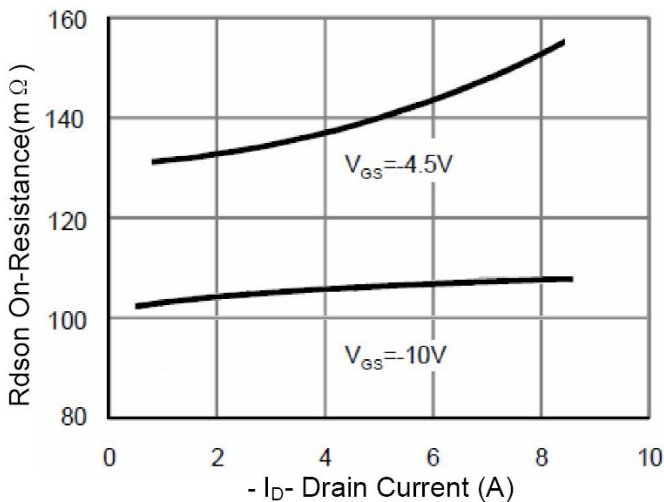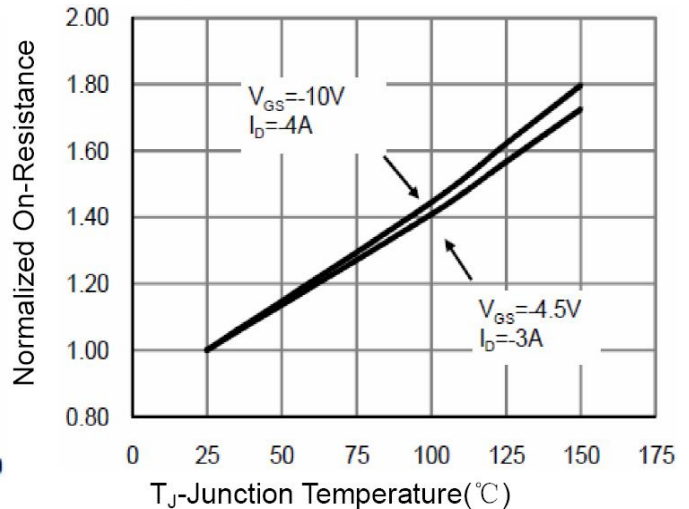**Figure 2 Transfer Characteristics**

Figure 3 Rdson- Drain Current

Figure 4 Rdson-Junction Temperature
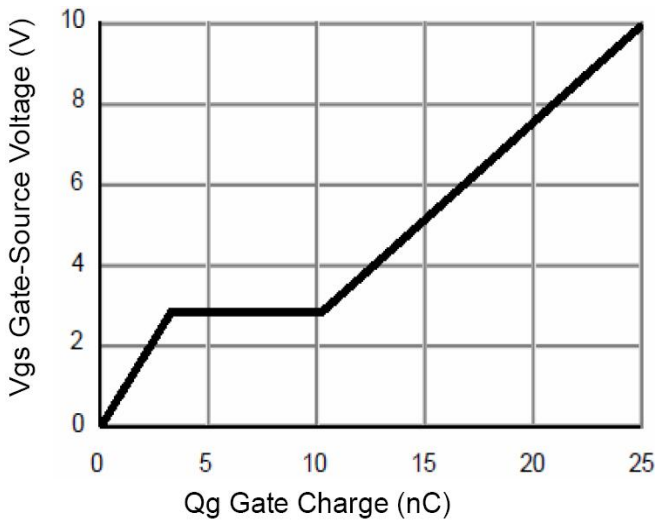
Figure 5 Gate Charge
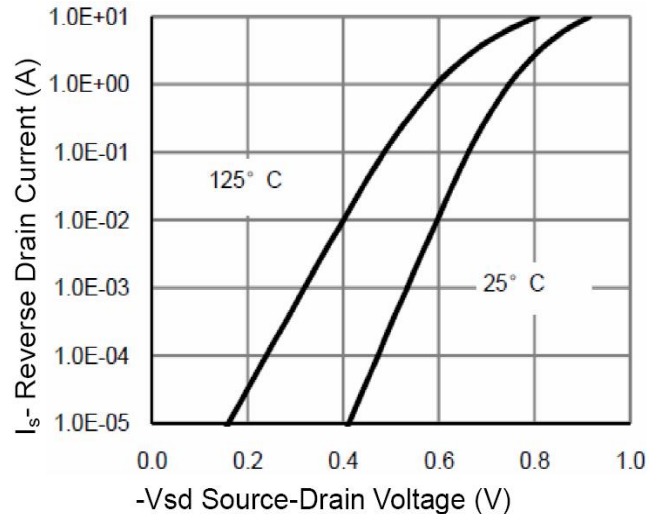
Figure 6 Source- Drain Diode Forward

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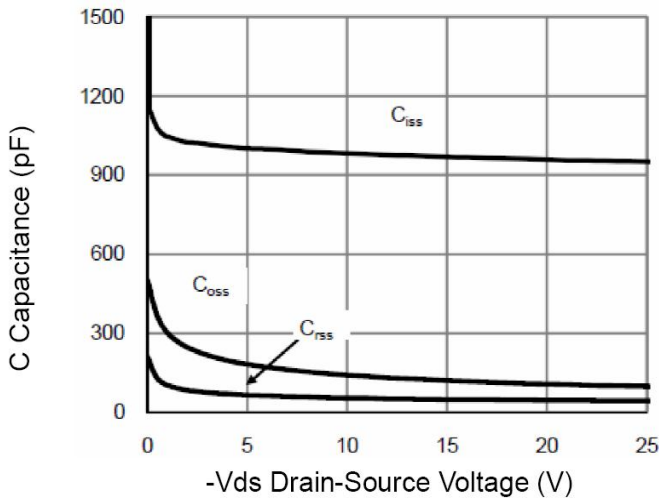| Document ID	Issued Date	Revised Date	Revision	Page.
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Typical Characteristics
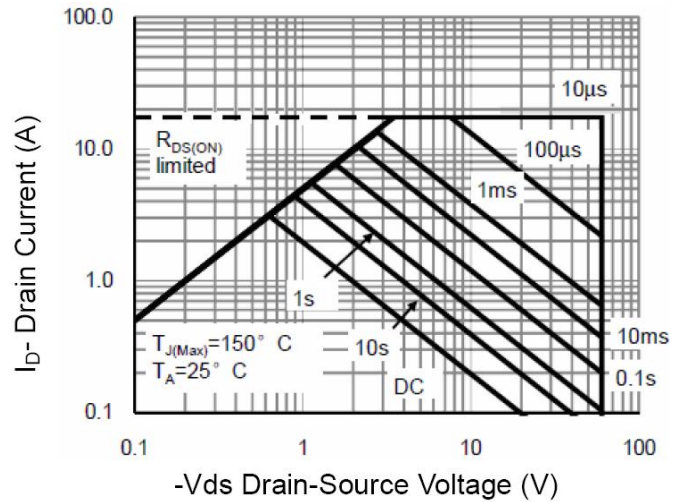

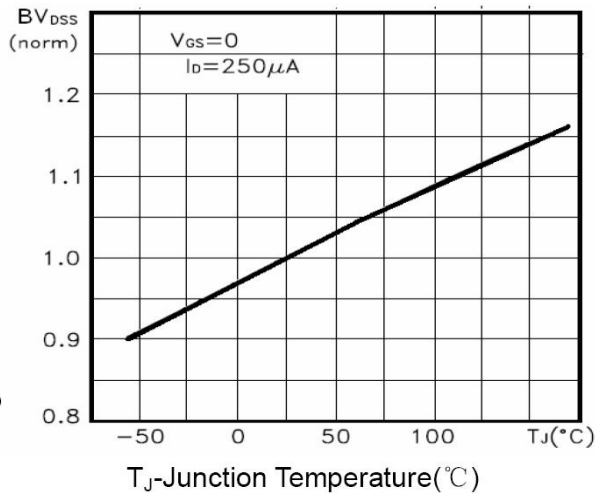**Figure 7 Capacitance vs Vds**

Figure 8 Safe Operation Area

Figure 9 BV$_{DSS}$ vs Junction Temperature
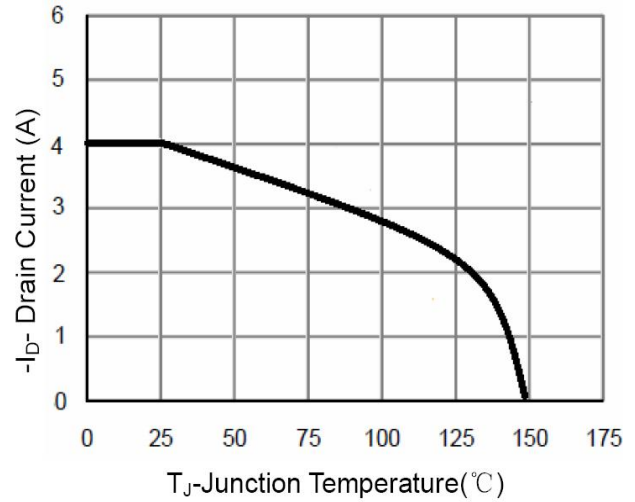
Figure 10 ID Current De-rating
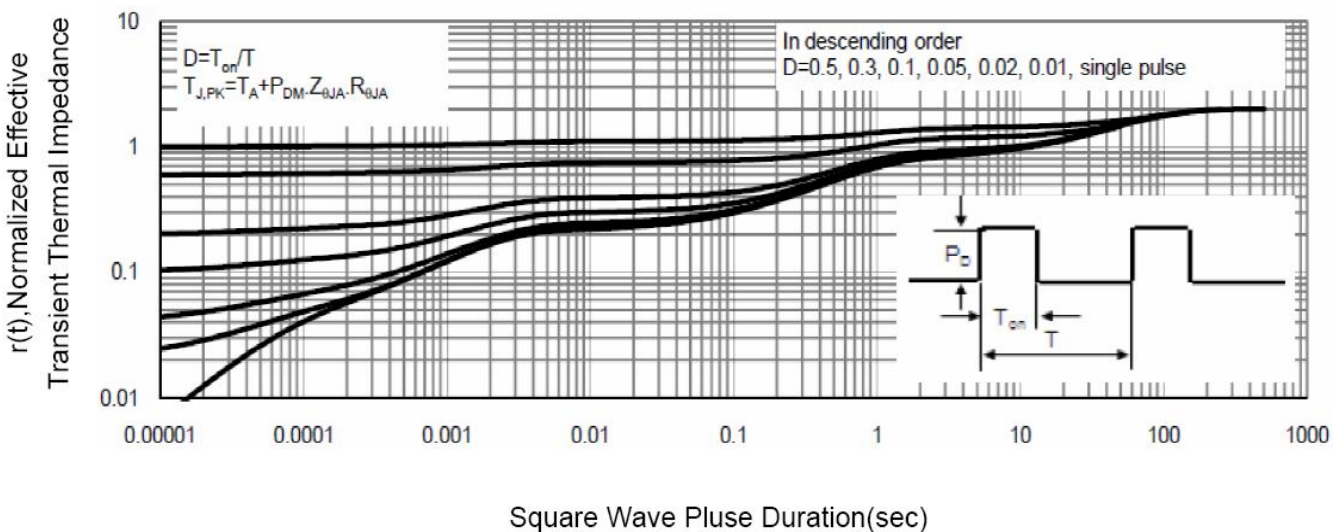
Figure 11 Normalized Maximum Transient Thermal Impedance
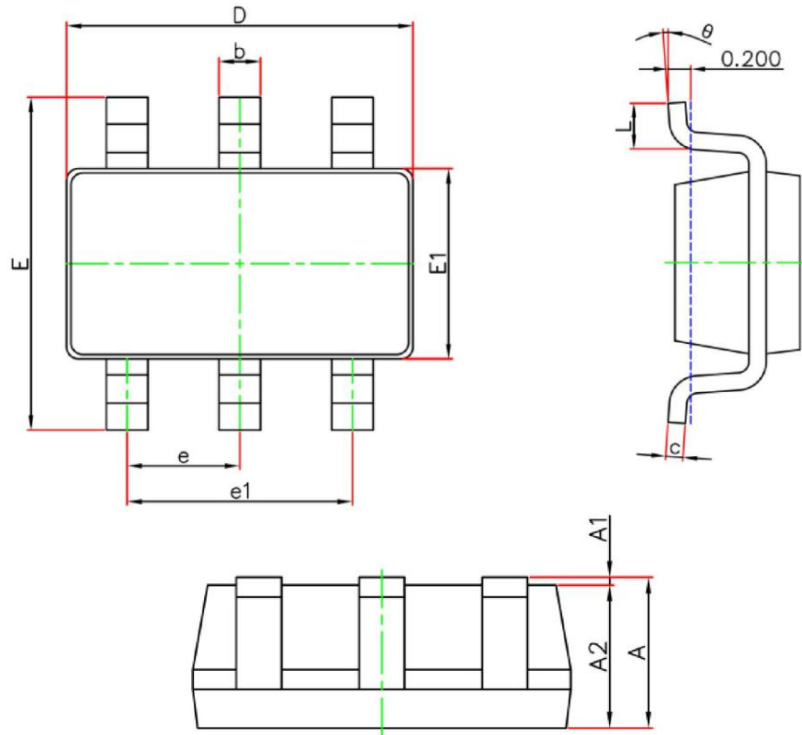
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SOT-23-6L Package Information

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950 (BSC)		0.037 (BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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