AS4612AS-Q1

N and P-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	28mΩ@10V	5A
	38mΩ@4.5V	

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	80mΩ@-10V	-4A

Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and cur
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Suffix "-Q1" for AEC-Q101

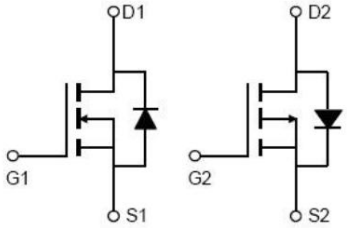
Application

- H-bridge
- Inverters

Package

SOP-8

Circuit diagram



Marking

AS4612AS-Q1

N and P-Channel Enhancement Mode MOSFET

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

Parameter	Symbol	N-Channel	p-Channel	Unit
Drain-Source Voltage	V_{DS}	60	-60	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current	I_D	5	-4	A
Pulsed Drain Current[1)]	I_{DM}	30	-30	A
Power Dissipation	P_D	2	2	W
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	62.5	62.5	℃/W
Junction Temperature	T_J	150	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	-55 ~ +150	℃

N-CH Electrical characteristics (T_A=25℃ 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[2)]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	1.6	2.5	V
Drain-source on-resistance[2)]	$R_{DS(on)}$	V_{GS}=10V, I_D=5A		24	28	mΩ
		V_{GS}=4.5V, I_D=5A		32	38	mΩ
Dynamic characteristics[3)]						
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V,f=1MHz		979		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			100		
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=10V,I_D=5A		22		nC
Gate-Source Charge	Q_{gs}			3.3		
Gate-Drain Charge	Q_{gd}			5.2		
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V,V_{GS}=10V R_L=2.5Ω,R_{GEN}=3Ω		4.2		nS
Turn-on rise time	t_r			3.4		
Turn-off delay time	$t_{d(off)}$			16		
Turn-off fall time	t_f			2		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				5	A
Diode Forward voltage[2)]	V_{SD}	V_{GS}=0V, I_S=5A			1.2	V

P-CH Electrical characteristics (T_C=25℃ 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[2)]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.5	-2.6	-3.0	V
Drain-source on-resistance[2)]	$R_{DS(on)}$	V_{GS}=-10V, I_D=-4A		64	80	mΩ
Dynamic characteristics[3)]						
Input Capacitance	C_{iss}	V_{DS}=-30V,V_{GS}=0V,f=1MHz		960		pF
Output Capacitance	C_{oss}			86		
Reverse Transfer Capacitance	C_{rss}			38		
Total Gate Charge	Q_g	V_{DS}=-30V,V_{GS}=-10V, I_D=-4A		15.8		nC
Gate-Source Charge	Q_{gs}			3		
Gate-Drain Charge	Q_{gd}			3.5		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-30V,V_{GS}=-10V, R_L=2.5Ω,R_{GEN}=3Ω		9		nS
Turn-on rise time	t_r			10		
Turn-off delay time	$t_{d(off)}$			25		
Turn-off fall time	t_f			11		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				-4	A
Diode Forward voltage[2)]	V_{SD}	V_{GS}=0V, I_S=-4A			-1.2	V

Notes:

1) Repetitive Rating: Pulse width limited by maximum junction temperature.

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

3) Guaranteed by design, not subject to production.

N- Channel Typical Characteristics

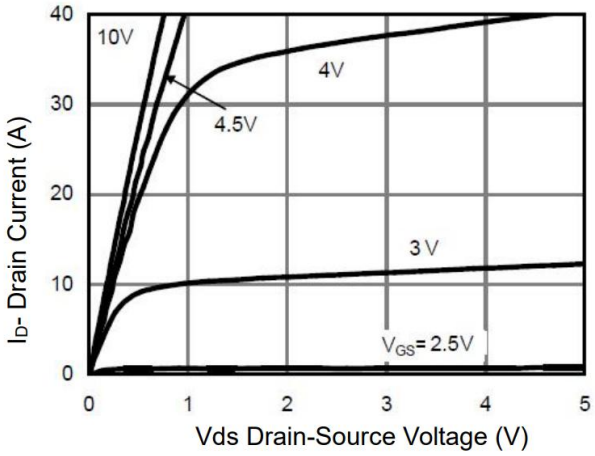


Figure 1 Output Characteristics

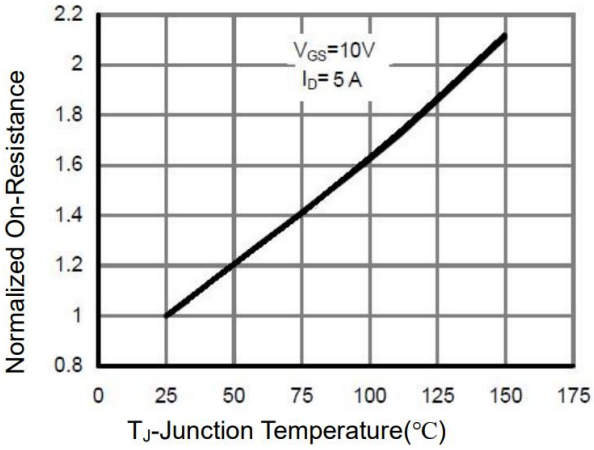


Figure 2 Rdson-Junction Temperature

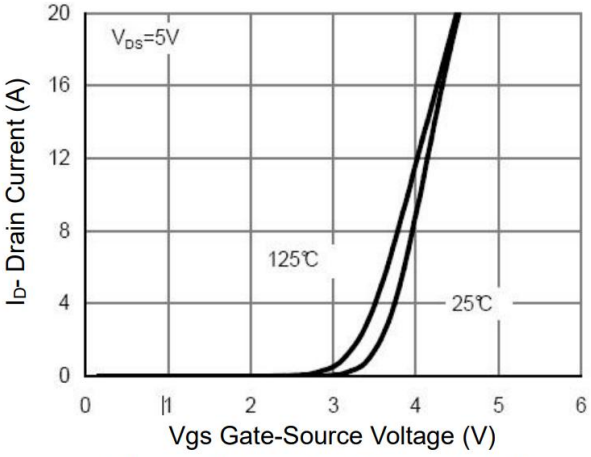


Figure 3 Transfer Characteristics

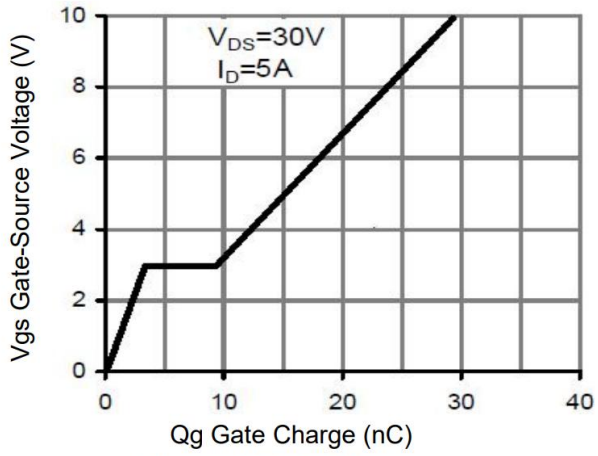


Figure 4 Gate Charge

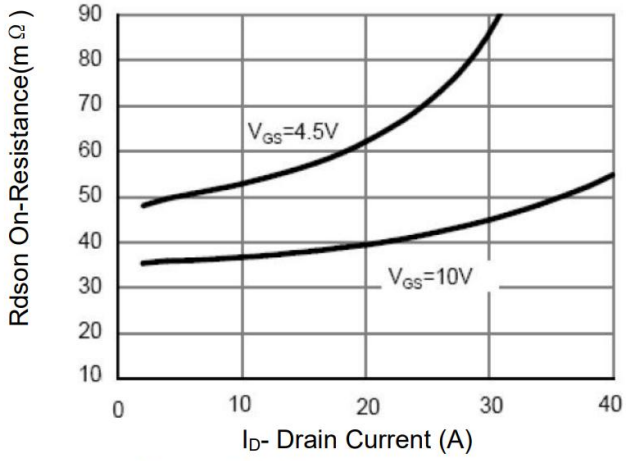


Figure 5 Rdson- Drain Current

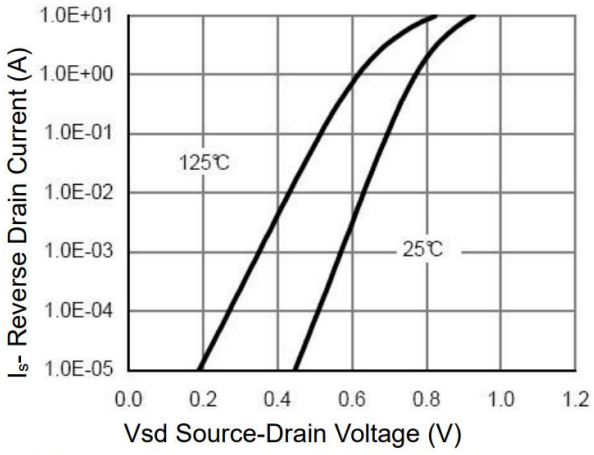


Figure 6 Source- Drain Diode Forward

N- Channel Typical Characteristics

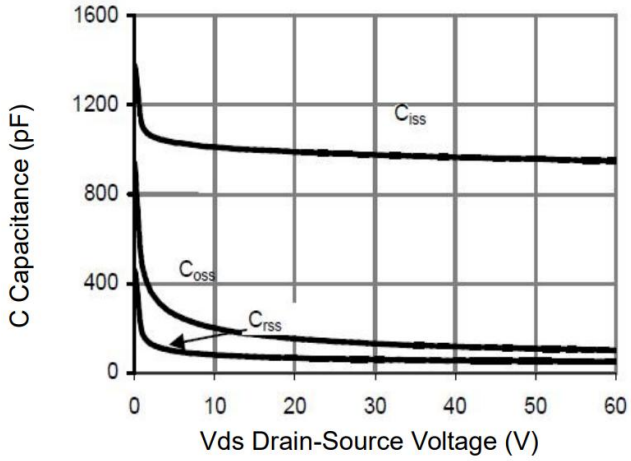


Figure 7 Capacitance vs Vds

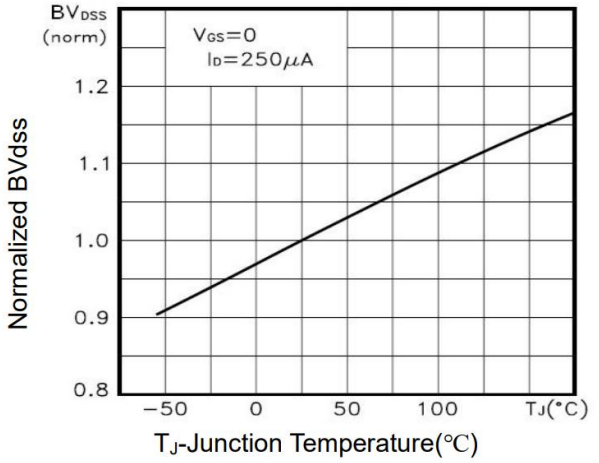


Figure 8 BV_{DSS} vs Junction Temperature

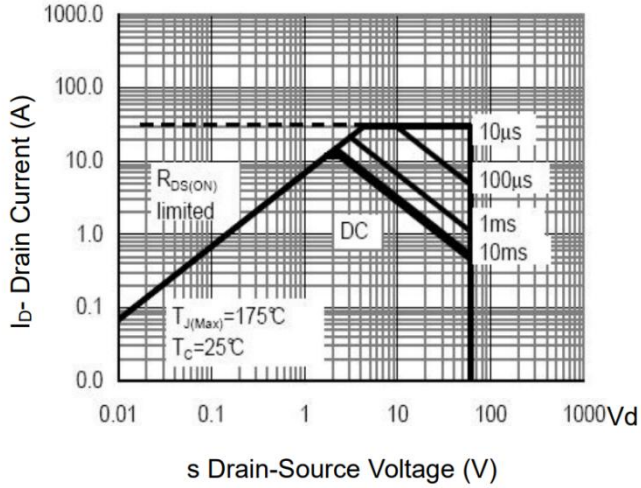


Figure 9 Safe Operation Area

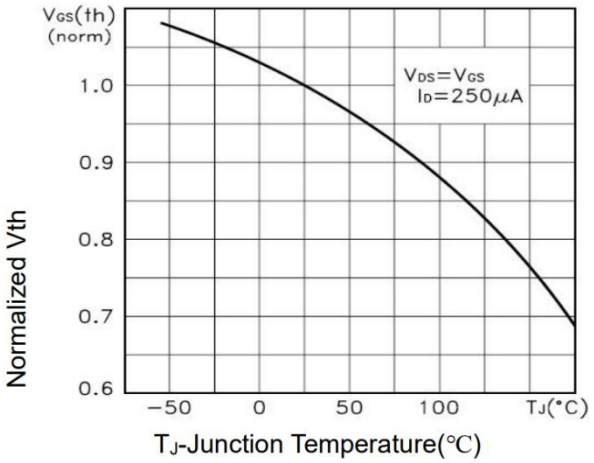


Figure 10 $V_{GS(th)}$ vs Junction Temperature

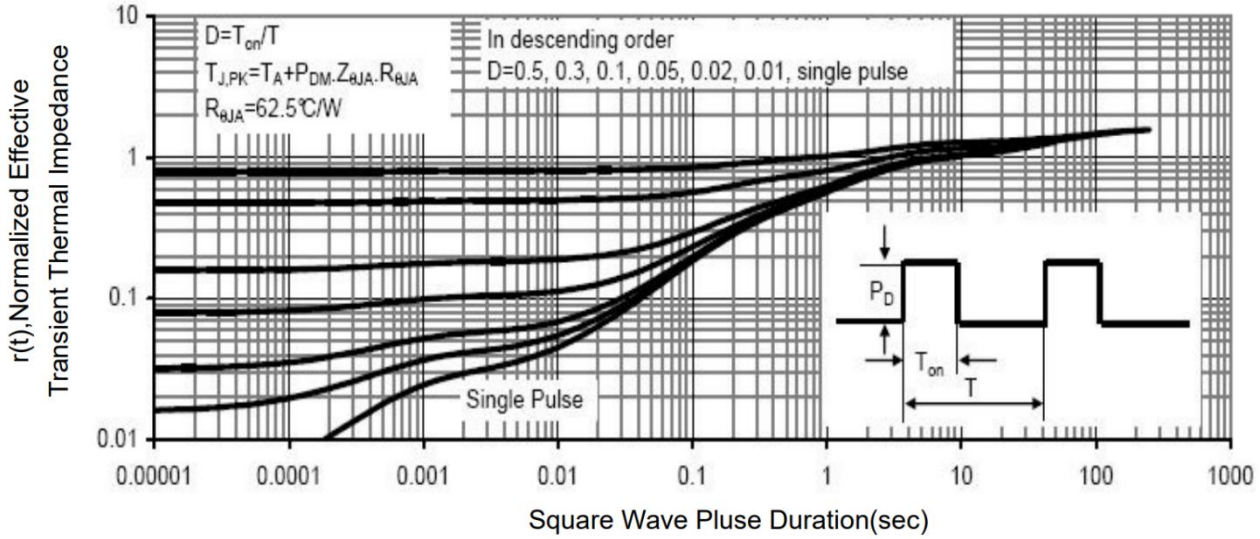


Figure 11 Normalized Maximum Transient Thermal Impedance

P- Channel Typical Characteristics

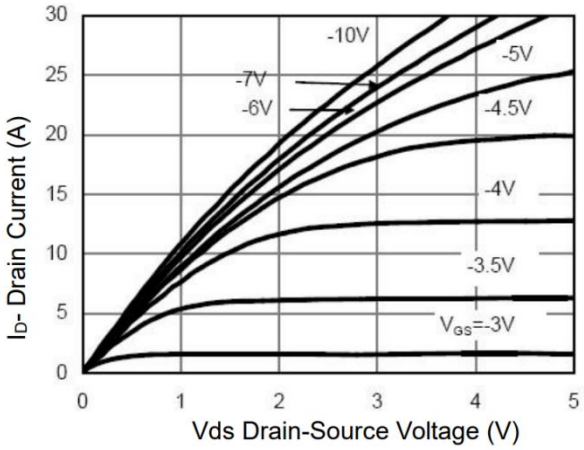


Figure 1 Output Characteristics

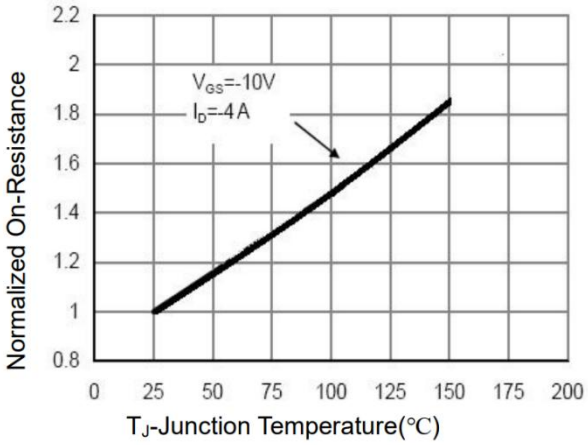


Figure 2 Rdson-Junction Temperature

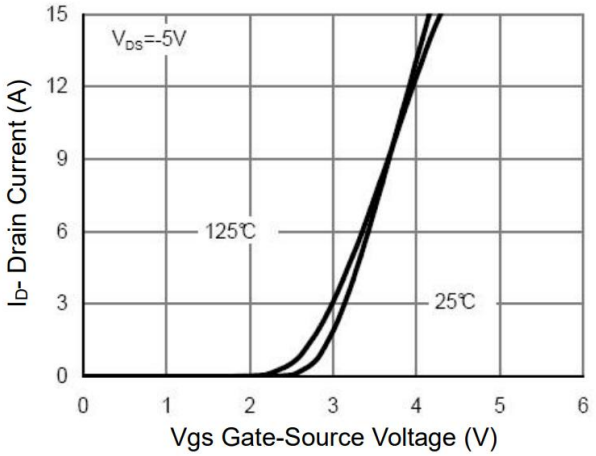


Figure 3 Transfer Characteristics

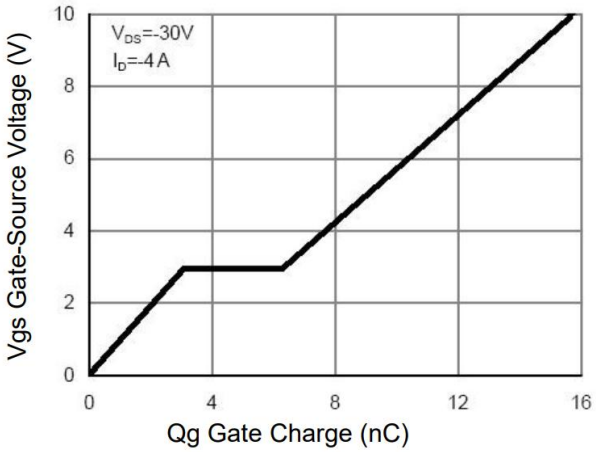


Figure 4 Gate Charge

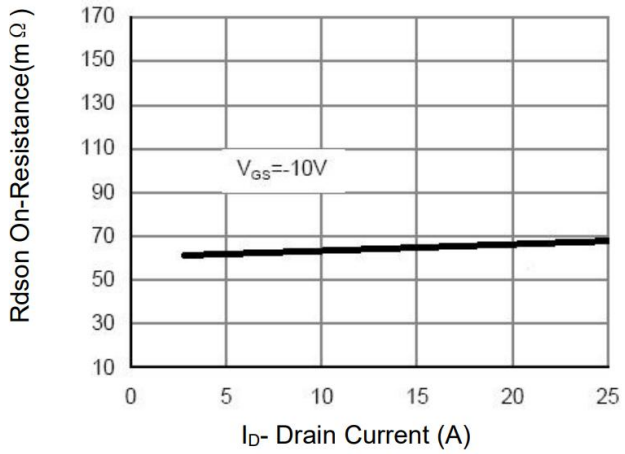


Figure 5 Rdson- Drain Current

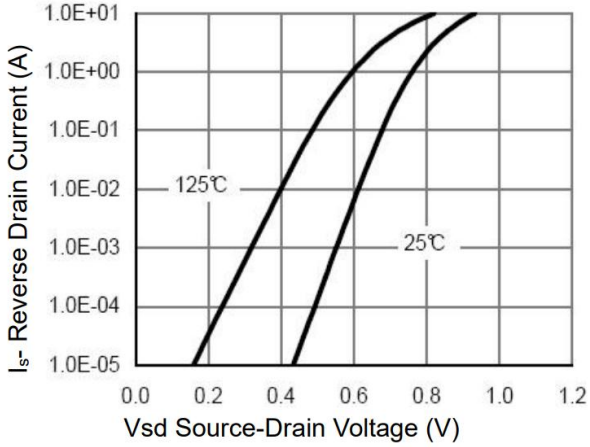


Figure 6 Source- Drain Diode Forward

P- Channel Typical Characteristics

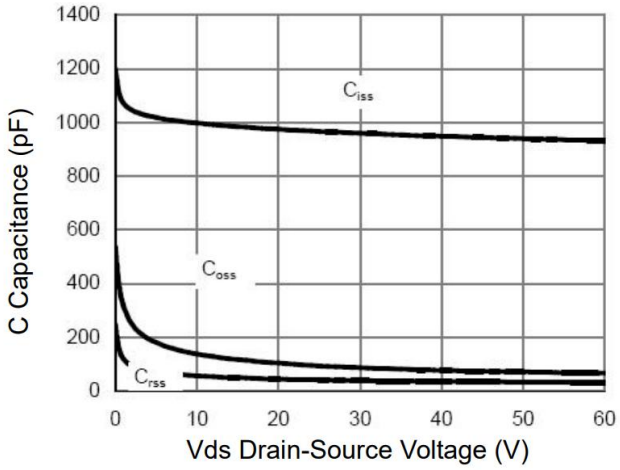
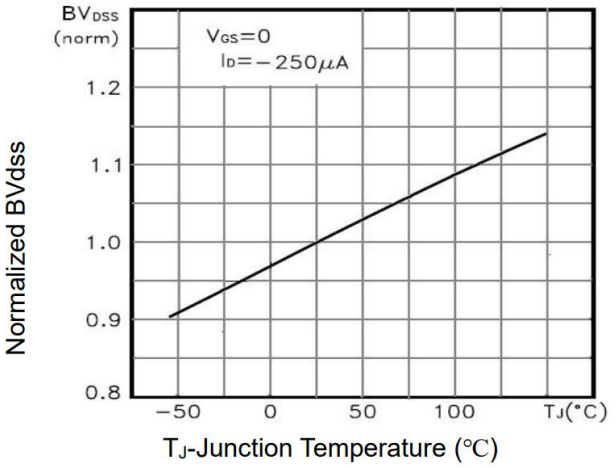


Figure 7 Capacitance vs Vds



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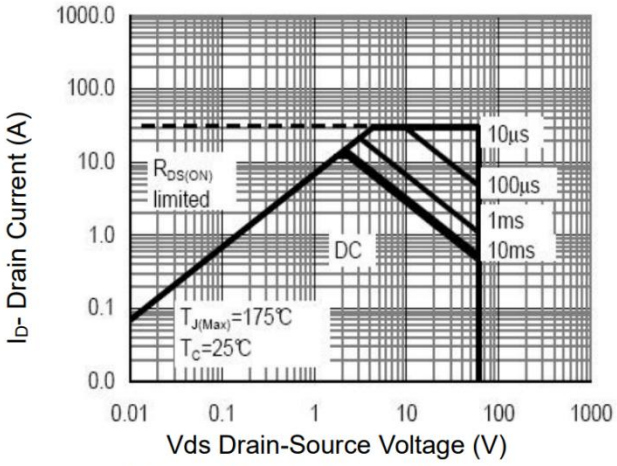

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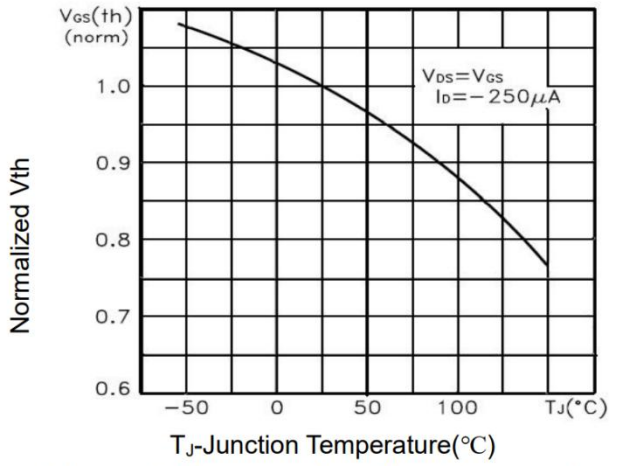

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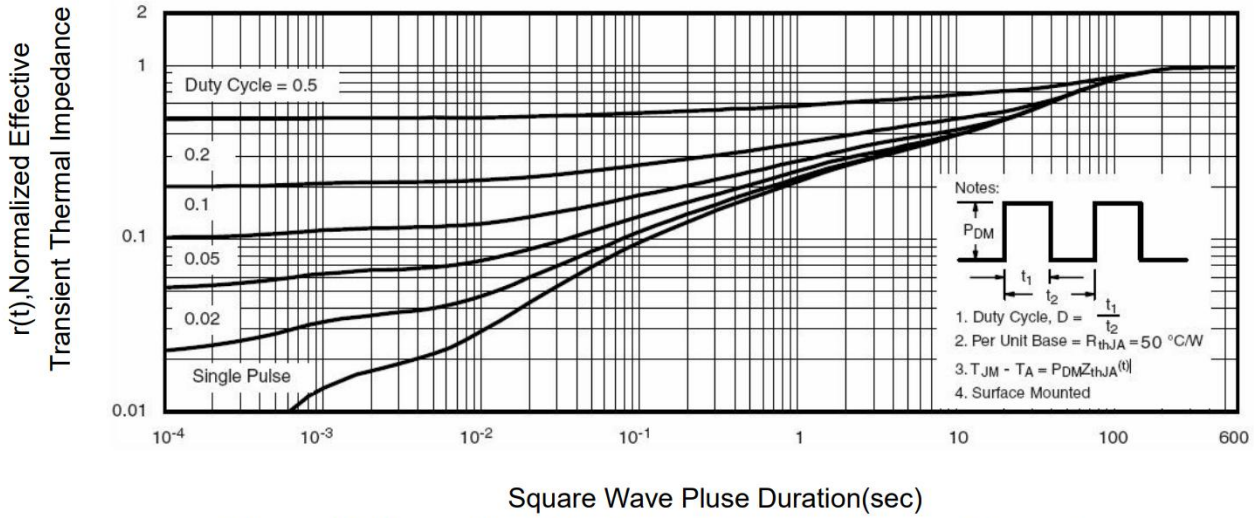
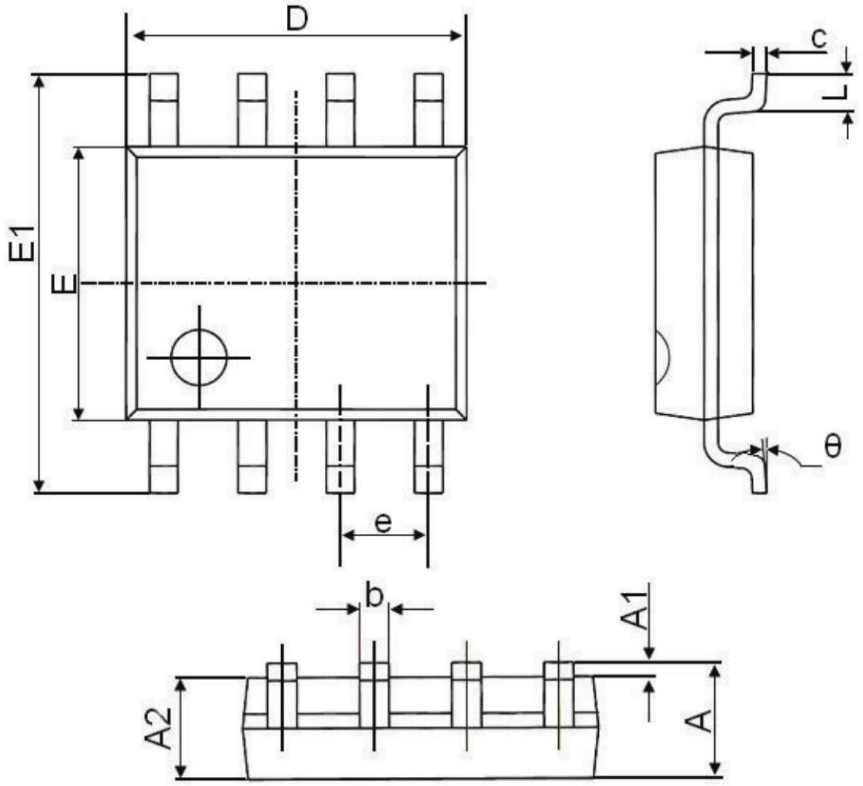


Figure 11 Normalized Maximum Transient Thermal Impedance

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°