

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

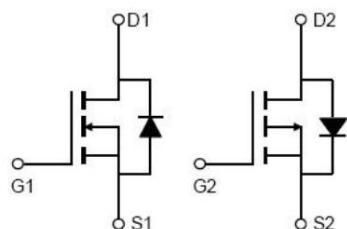
- H-bridge
- Inverters

Package

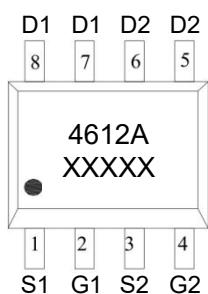


SOP-8

Circuit diagram



Marking



Absolute maximum ratings (T_A=25°C 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 _{θJA}	62.5	62.5	°C/W
Junction Temperature	T _J	150	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	-55 ~ +150	°C

N-CH Electrical characteristics (T_A=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 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 characteristics³⁾						
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 ($T_c=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-60V, V_{GS}=0V$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate threshold voltage ²⁾	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	-1.5	-2.6	-3.0	V
Drain-source on-resistance ²⁾	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-4A$		64	80	$m\Omega$
Dynamic characteristics³⁾						
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	$t_{d(on)}$	$V_{DD}=-30V, V_{GS}=-10V, R_L=2.5\Omega, R_{GEN}=3\Omega$		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

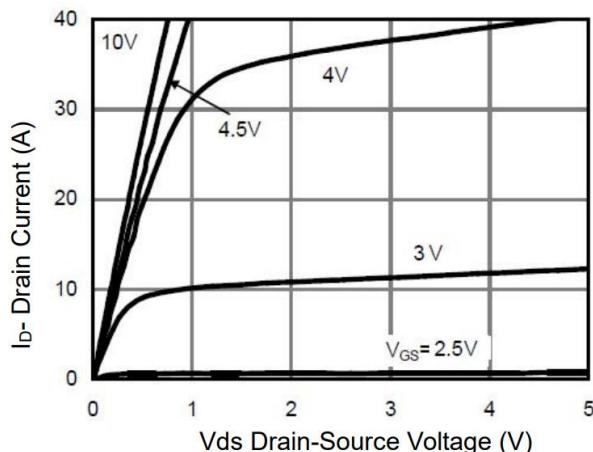


Figure 1 Output Characteristics

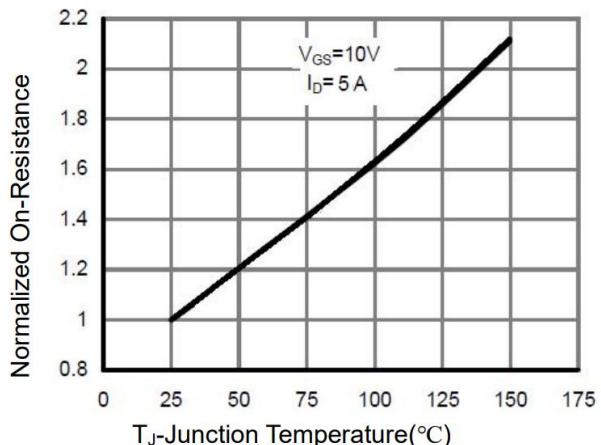


Figure 2 Rdson-Junction Temperature

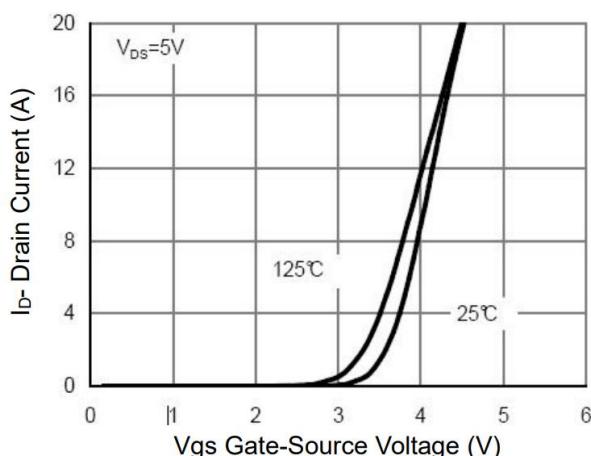


Figure 3 Transfer Characteristics

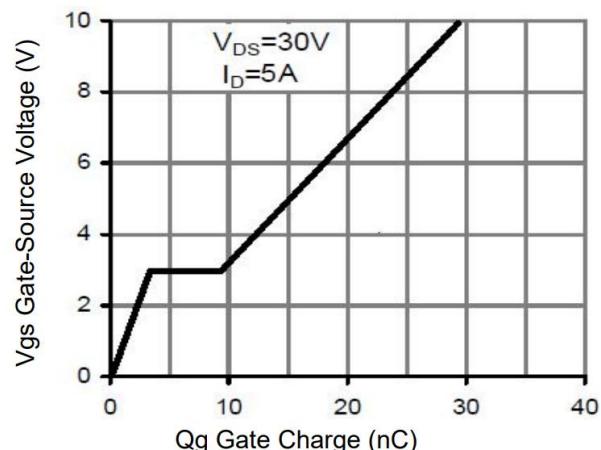


Figure 4 Gate Charge

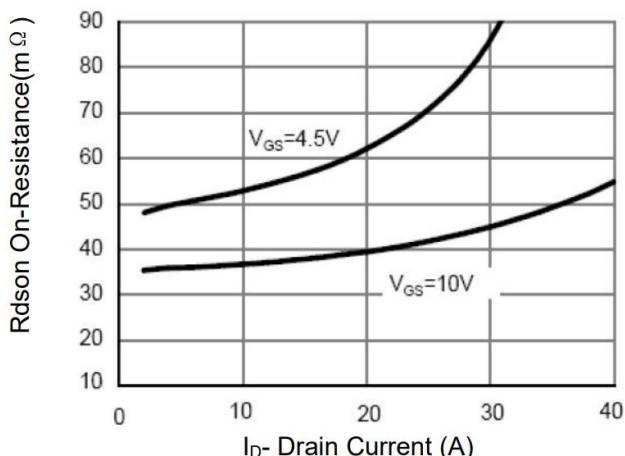


Figure 5 Rdson- Drain Current

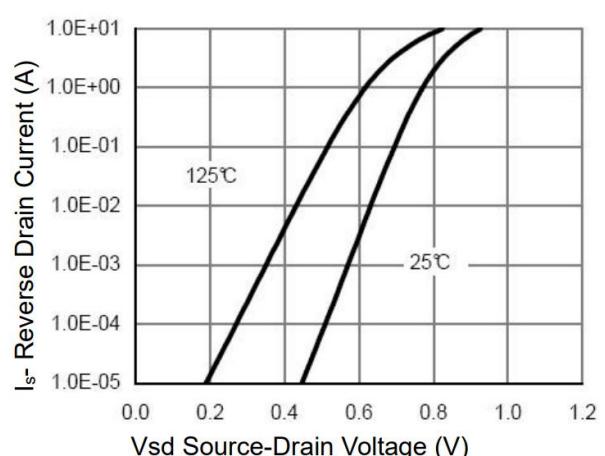


Figure 6 Source- Drain Diode Forward

N-Channel Typical Characteristics

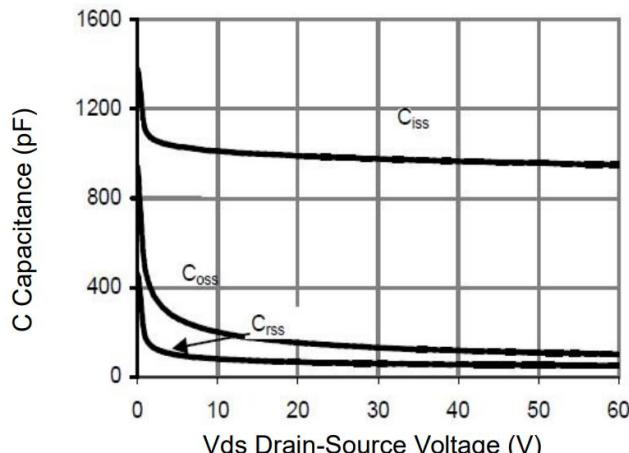


Figure 7 Capacitance vs Vds

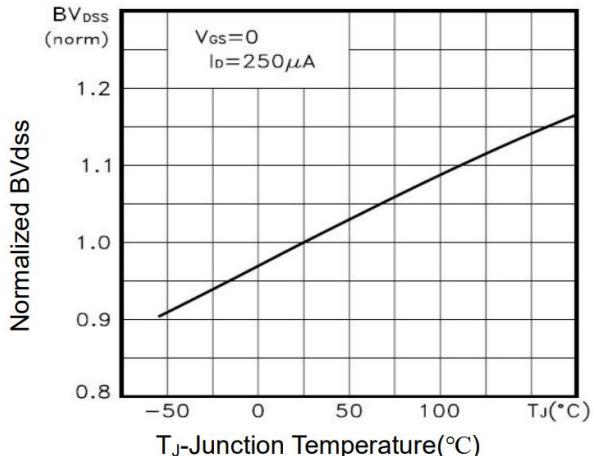


Figure 8 BV_{dss} vs Junction Temperature

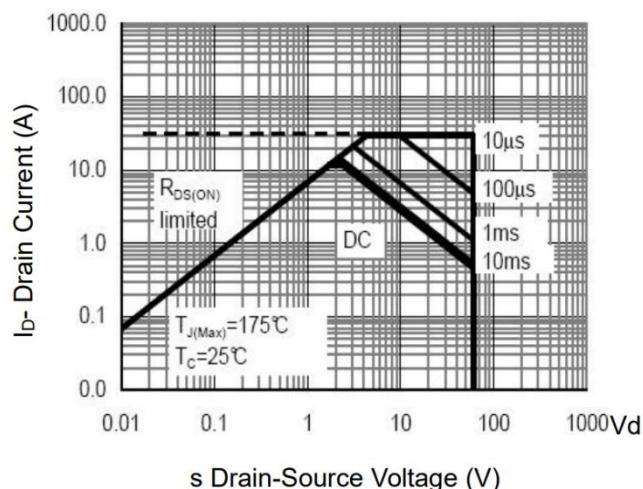


Figure 9 Safe Operation Area

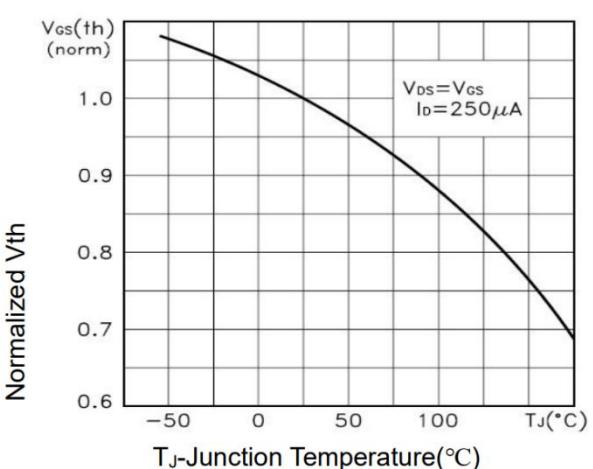


Figure 10 $V_{gs(th)}$ vs Junction Temperature

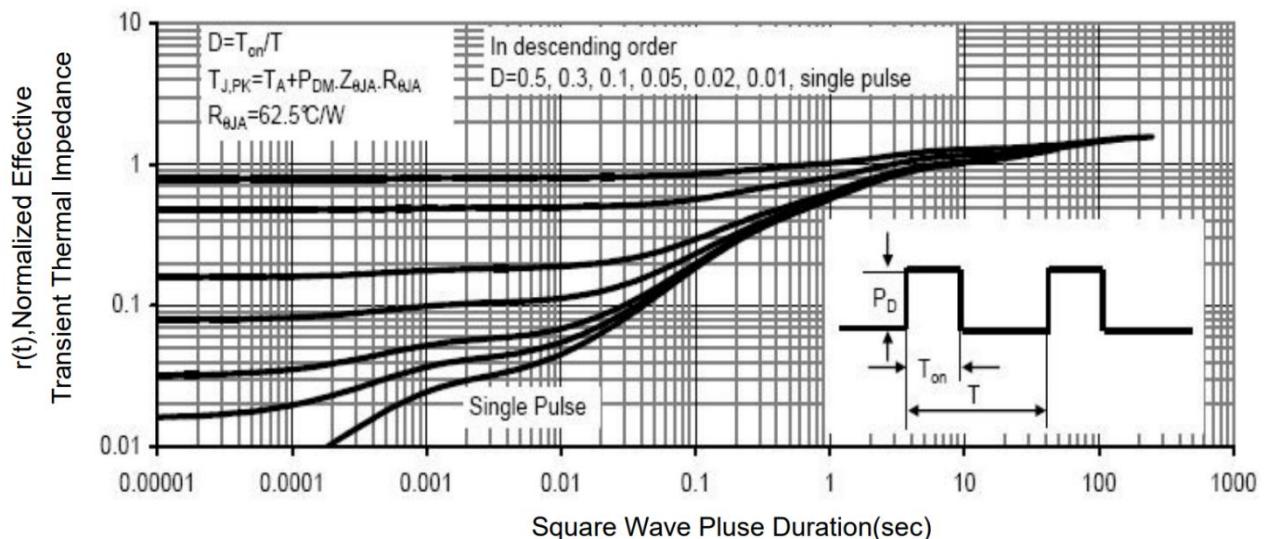


Figure 11 Normalized Maximum Transient Thermal Impedance

P- Channel Typical Characteristics

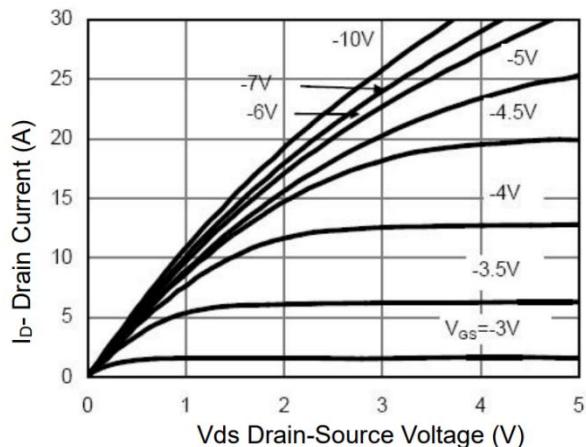


Figure 1 Output Characteristics

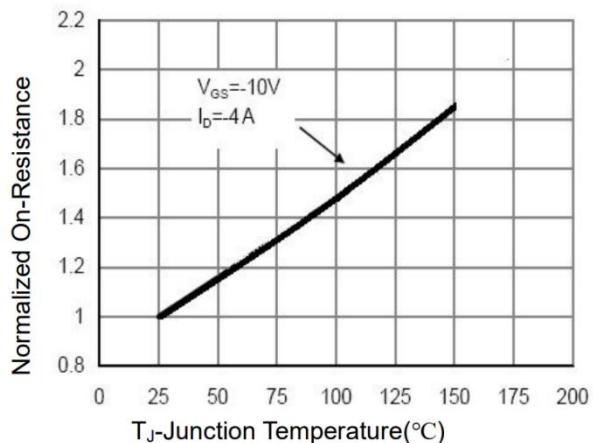


Figure 2 R_{DSON} -Junction Temperature

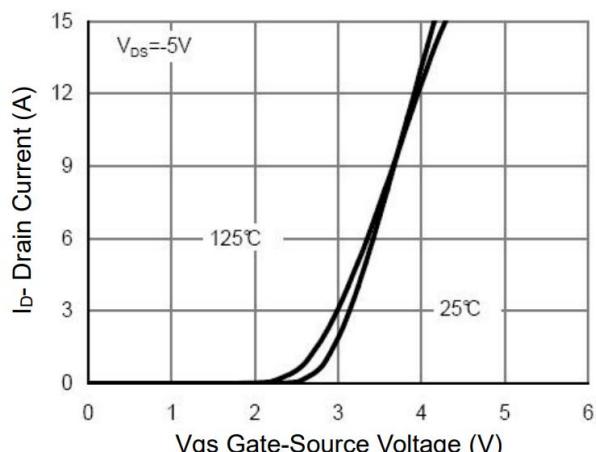


Figure 3 Transfer Characteristics

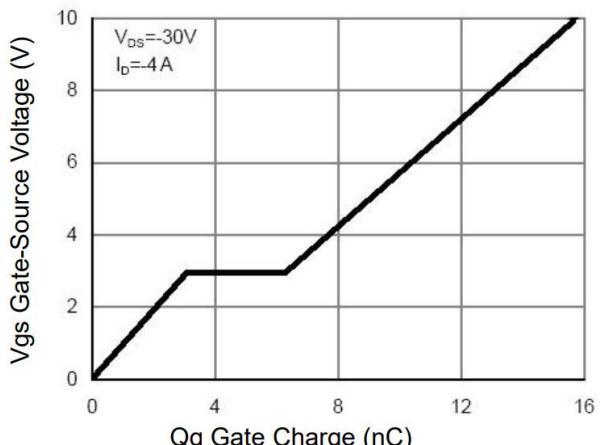


Figure 4 Gate Charge

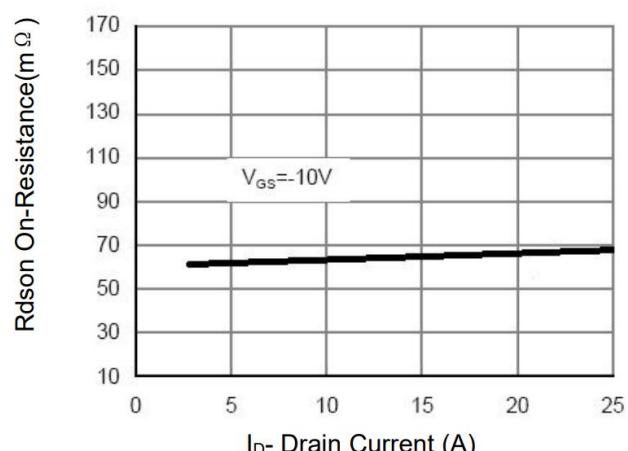


Figure 5 R_{DSON} - Drain Current

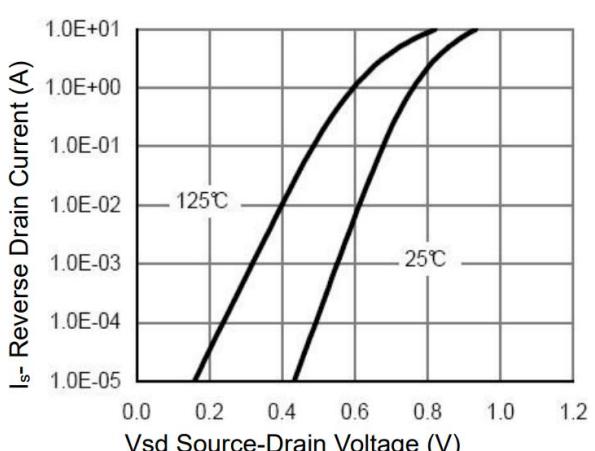


Figure 6 Source- Drain Diode Forward

P- Channel Typical Characteristics

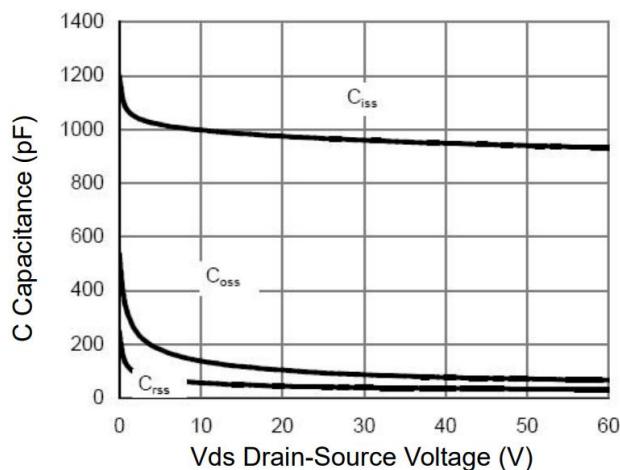


Figure 7 Capacitance vs Vds

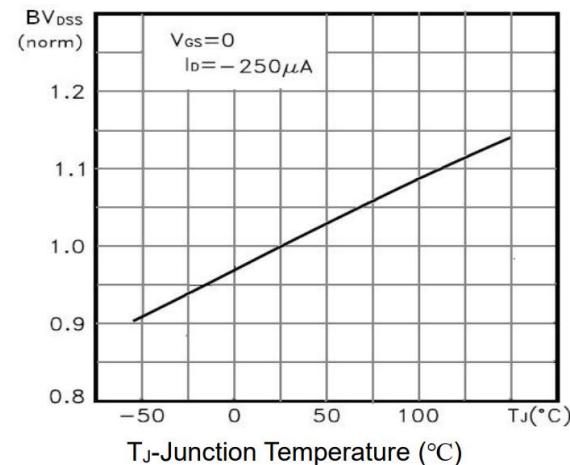


Figure 8 BV_{dss} vs Junction Temperature

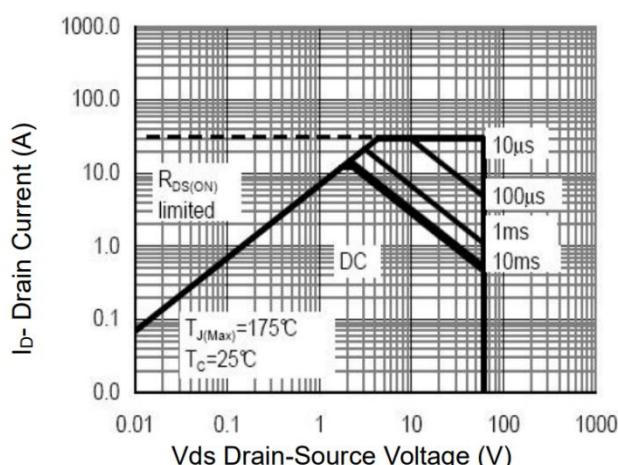


Figure 9 Safe Operation Area

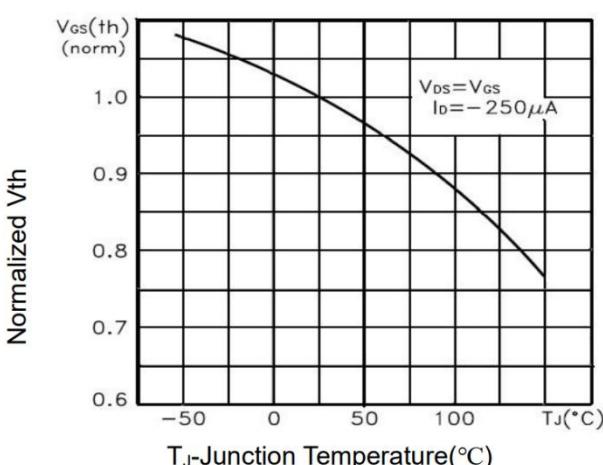


Figure 10 $V_{GS(\text{th})}$ vs Junction Temperature

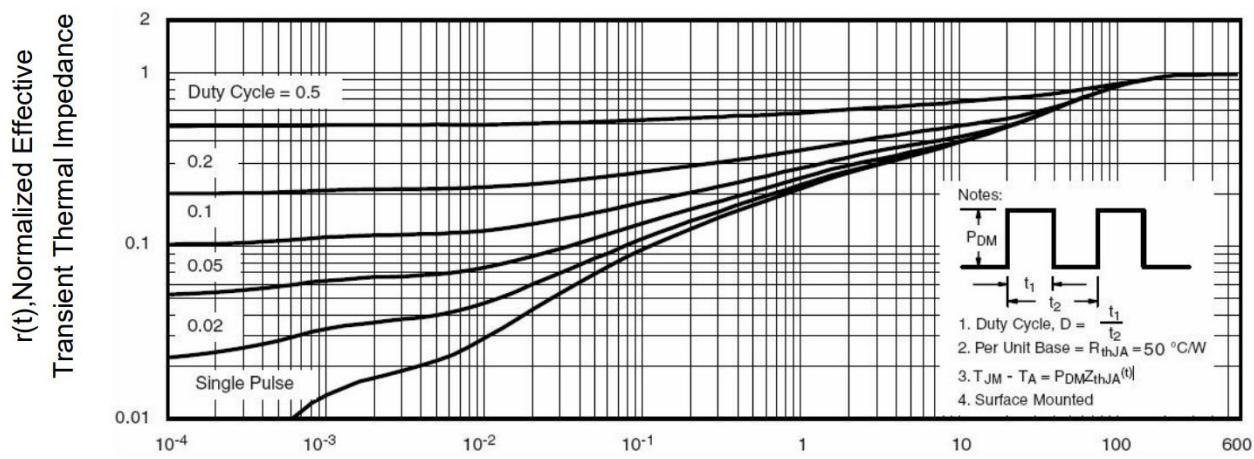
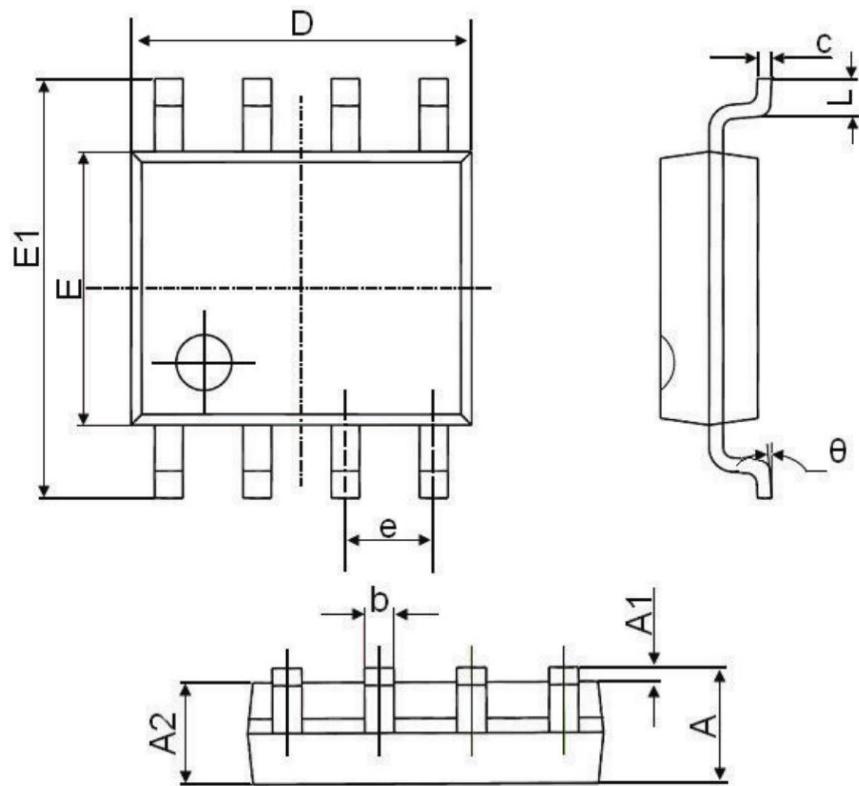


Figure 11 Normalized Maximum Transient Thermal Impedance

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°