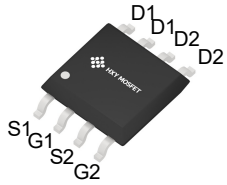
AUIRF7319QTR

Dual N+P-Channel Enhancement Mode MOSFET

Description

The AUIRF7319QTR uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



SOP-8

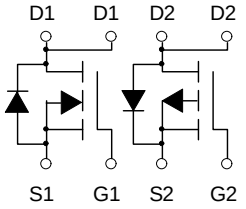
General Features

V_{DS} = 60V I_D =7A

$R_{DS(ON)}$ < 30mΩ @ V_{GS}=10V

V_{DS} = -60V I_D =-8A

$R_{DS(ON)}$ < 29 mΩ @ V_{GS}=-10V



N-Channel and P-Channel

Application

Wireless charging

Boost driver

Brushless motor

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
AUIRF7319QTR	SOP-8	HXY MOSFET	3000

Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Symbol	Parameter	Rating		Units
		N-Channel	P-Channel	
VDS	Drain-Source Voltage	60	-60	V
VGS	Gate-Source Voltage	±20	±20	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	7.0	-8.0	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	4.5	-4.8	A
IDM	Pulsed Drain Current[2]	18	-30	A
P_D@T_A=25°C	Total Power Dissipation[4]	3.5	4	W
TSTG	Storage Temperature Range	-55 to 150	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	-55 to 150	°C
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	96	41.7	°C/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	36	30	°C/W

N-Electrical Characteristics (T_A=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS} = 0V,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.0	1.6	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=4A	-	25	30	mΩ
		V_{GS}=4.5V, I_D=2A	-	34	45	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1.0MHz	-	1349	-	pF
C_{oss}	Output Capacitance		-	84	-	pF
C_{rss}	Reverse Transfer Capacitance		-	59	-	pF
Q_g	Total Gate Charge	V_{DS}=48V, I_D=4A, V_{GS}=4.5V	-	12.6	-	nC
Q_{gs}	Gate-Source Charge		-	3.2	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	6.3	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=30V, I_D=4A, R_G=3.3Ω, V_{GS}=10V	-	7	-	ns
t_r	Turn-on Rise Time		-	14.1	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	24.3	-	ns
t_f	Turn-off Fall Time		-	4.5	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	7	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	18	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=1A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=5A, dI/dt=100A/μs	-	33	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	53	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition : T_J=25°C,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω,I_{AS}=8.7A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

P-Electrical Characteristics (T_A=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Curren	V_{DS}=±48V , V_{GS}=0V	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{GS}=±20V , V_{DS}=0V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	1.0	1.6	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=-10V , I_D=-5A	-	24	29	mΩ
		V_{GS}=-4.5V , I_D=-4A	-	30	39	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-25V , V_{GS}=0V , f=1MHz	-	4024	-	pF
C_{oss}	Output Capacitance		-	132	-	pF
C_{rss}	Reverse Transfer Capacitance		-	96	-	pF
Q_g	Total Gate Charge	V_{DS}=-30V , V_{GS}=-10V, I_D=-5A	-	52	-	nC
Q_{gs}	Gate-Source Charge		-	9	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	11	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-30V , V_{GS}=-10V , R_G=3Ω ,I_D=-1A	-	11	-	ns
t_r	Turn-on Rise Time		-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	62	-	ns
t_f	Turn-off Fall Time		-	12	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-8	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-30	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=-1A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=5A, dI/dt=100A/μs	-	70	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	60	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition : T_J=25°C,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω,I_{AS}=8.7A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

N-Channel Typical Characteristics

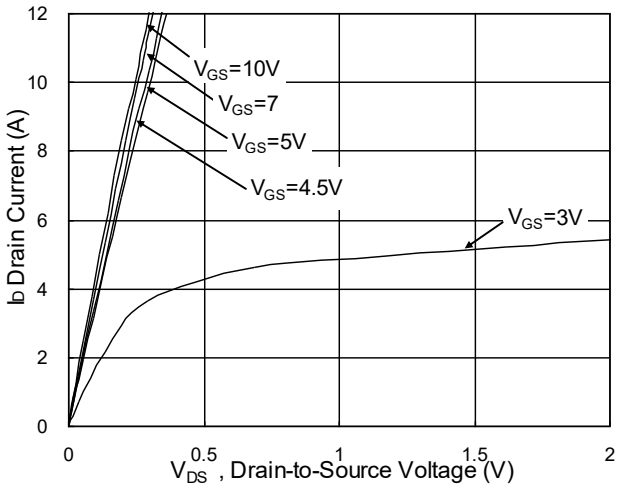


Fig.1 Typical Output Characteristics

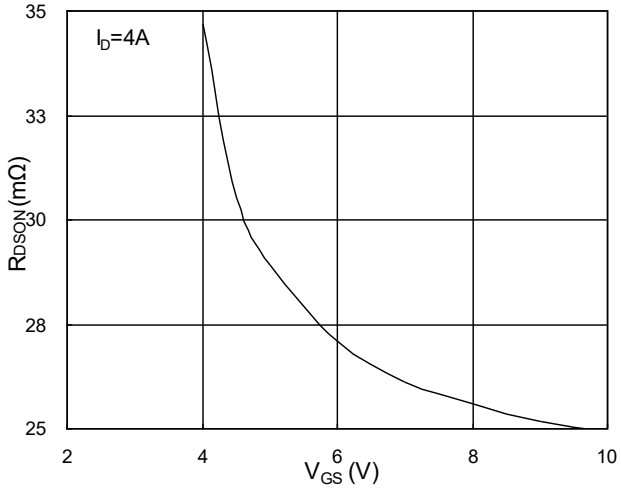


Fig.2 On-Resistance v.s Gate-Source

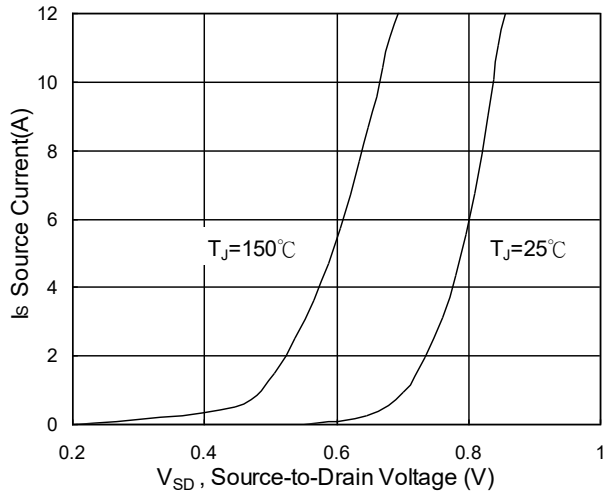


Fig.3 Forward Characteristics of Reverse

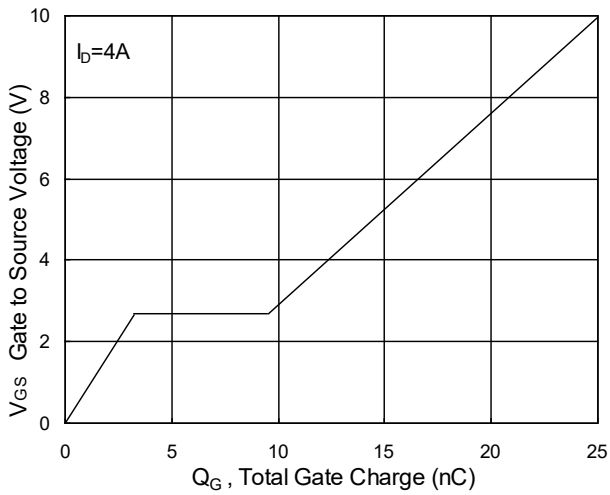


Fig.4 Gate-Charge Characteristics

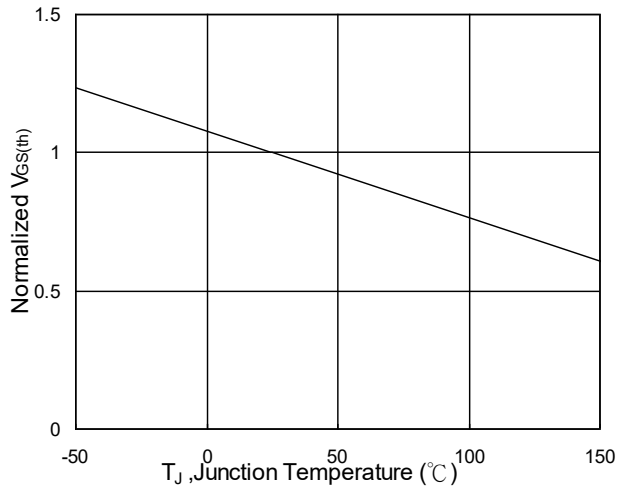


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

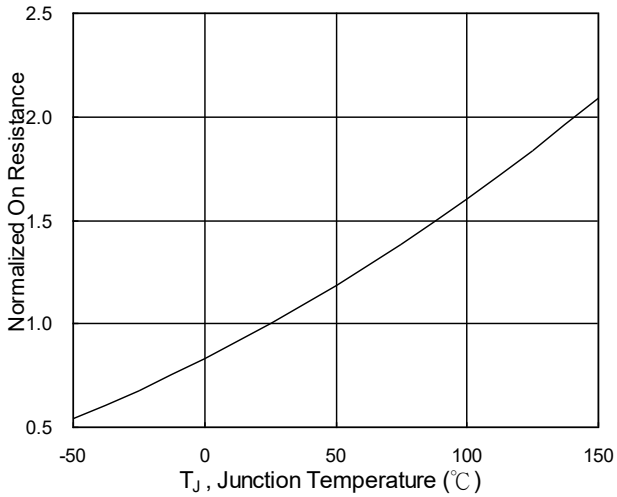


Fig.6 Normalized R_{DSON} v.s T_J

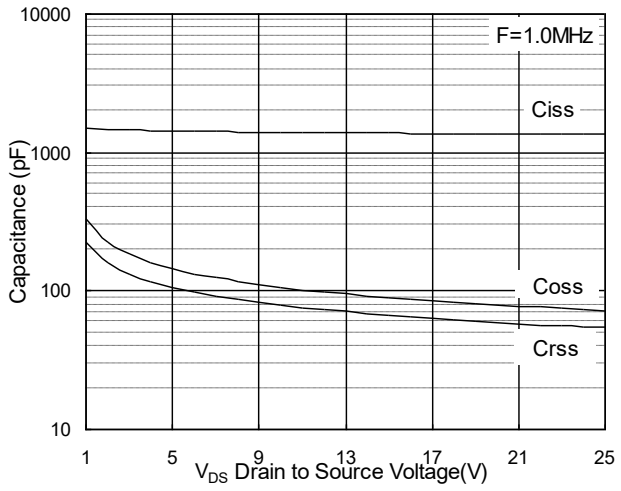


Fig.7 Capacitance

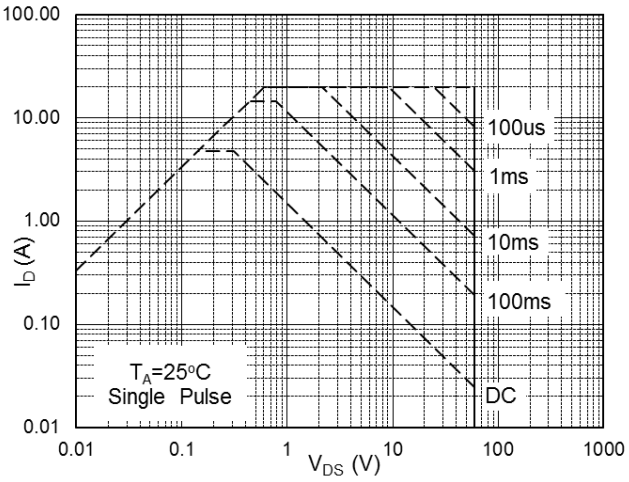


Fig.8 Safe Operating Area

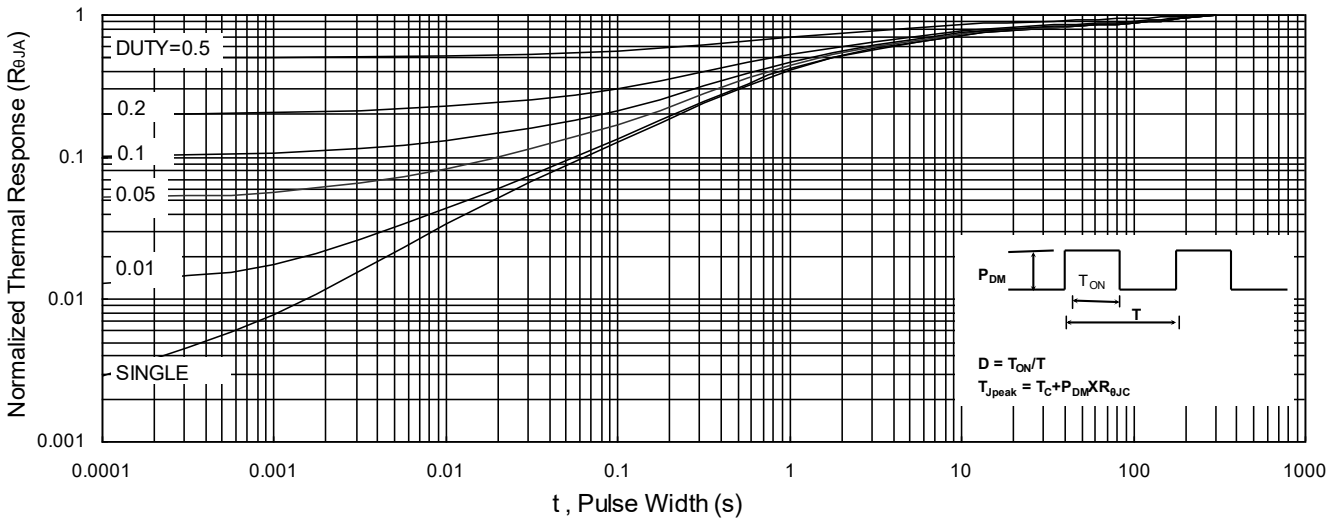


Fig.9 Normalized Maximum Transient Thermal Impedance

P-Channel Typical Characteristics

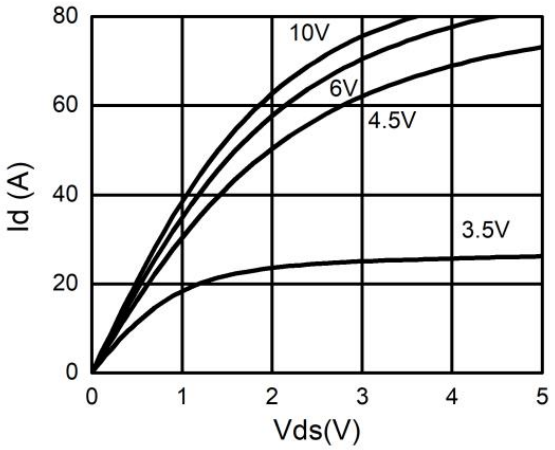


Figure 1. Output Characteristics

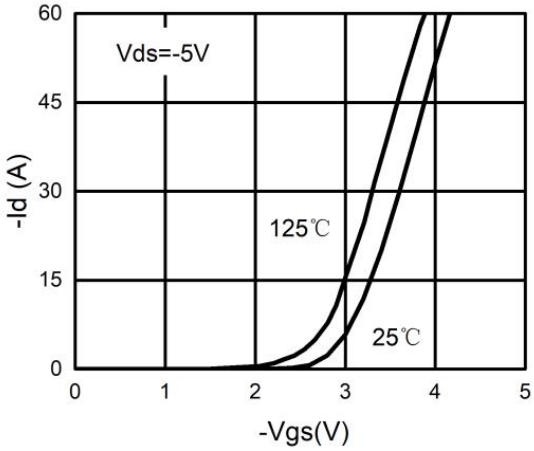


Figure 2. Transfer Characteristics

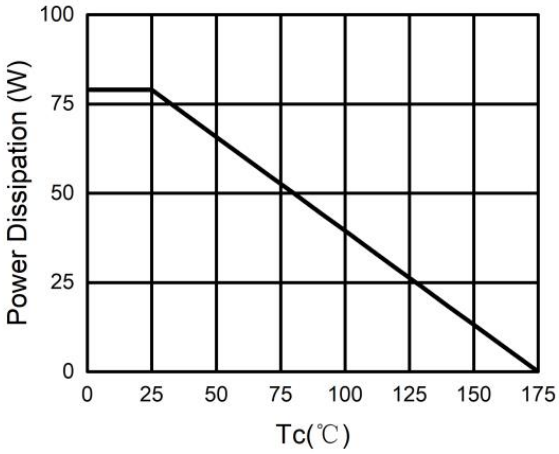


Figure 3. Power Dissipation

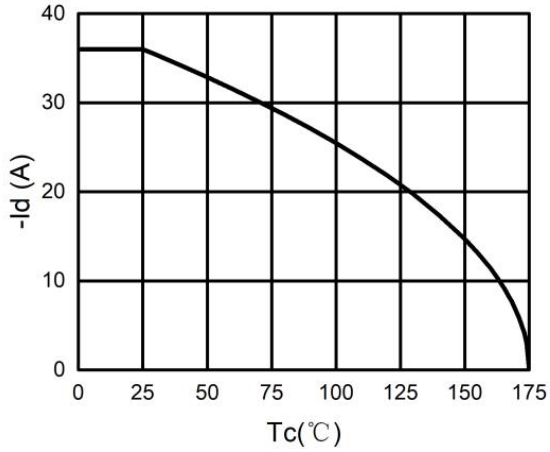


Figure 4. Drain Current

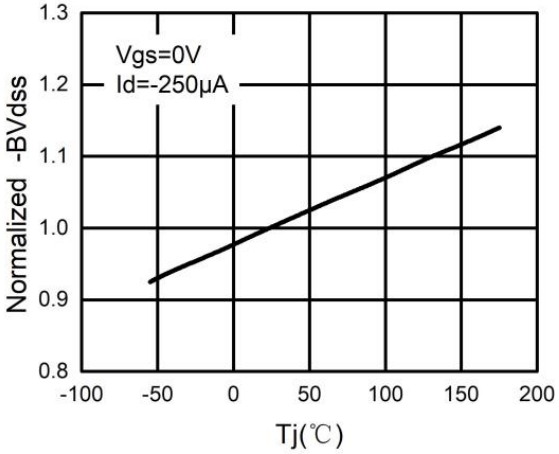


Figure 5. BV_{DSS} vs Junction Temperature

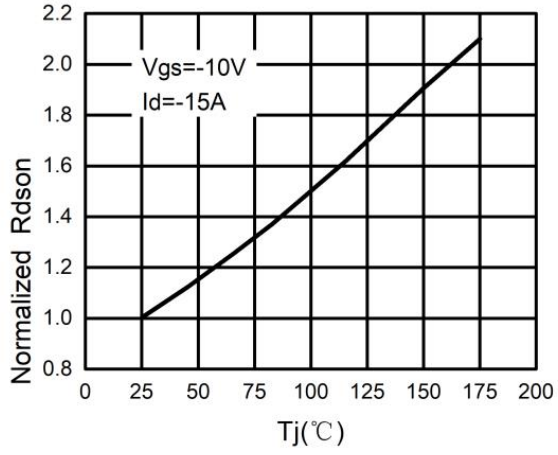


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

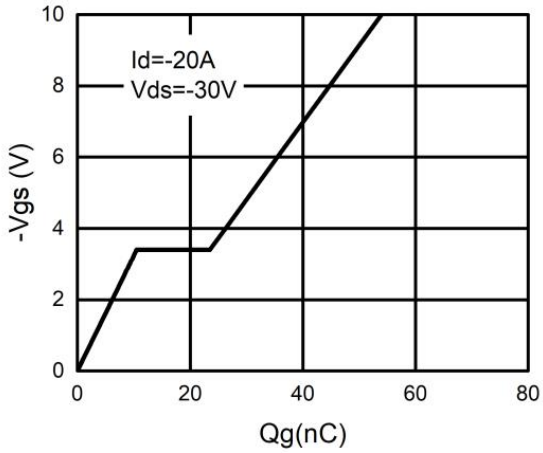


Figure 7. Gate Charge Waveforms

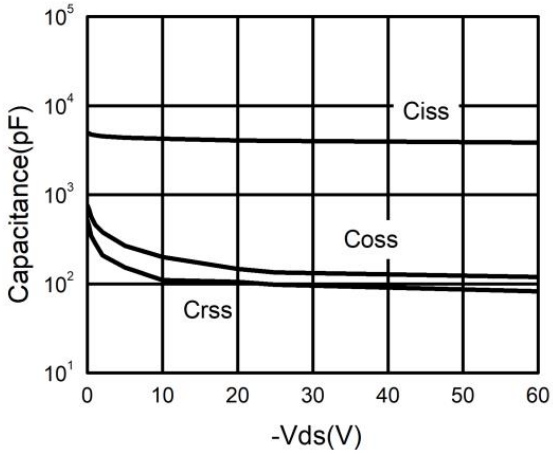


Figure 8. Capacitance

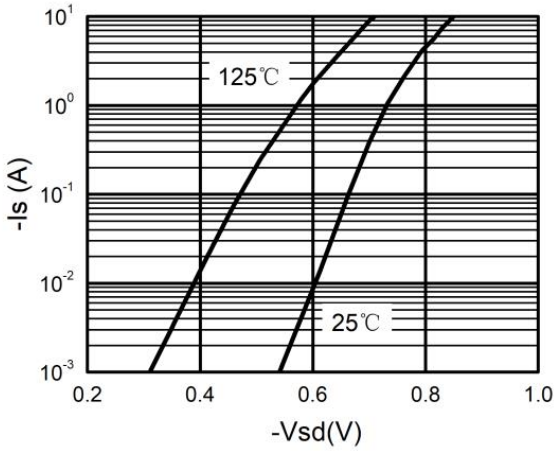


Figure 9. Body-Diode Characteristics

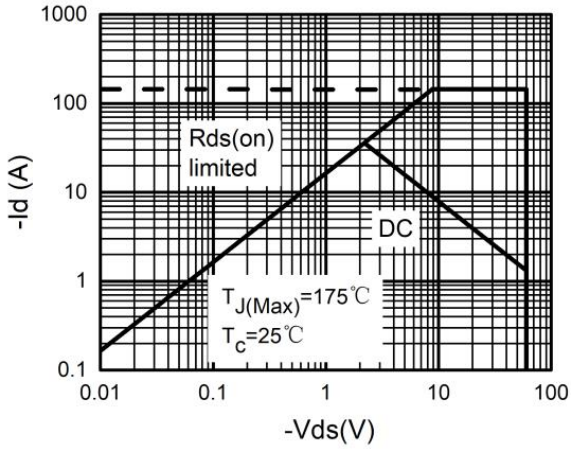
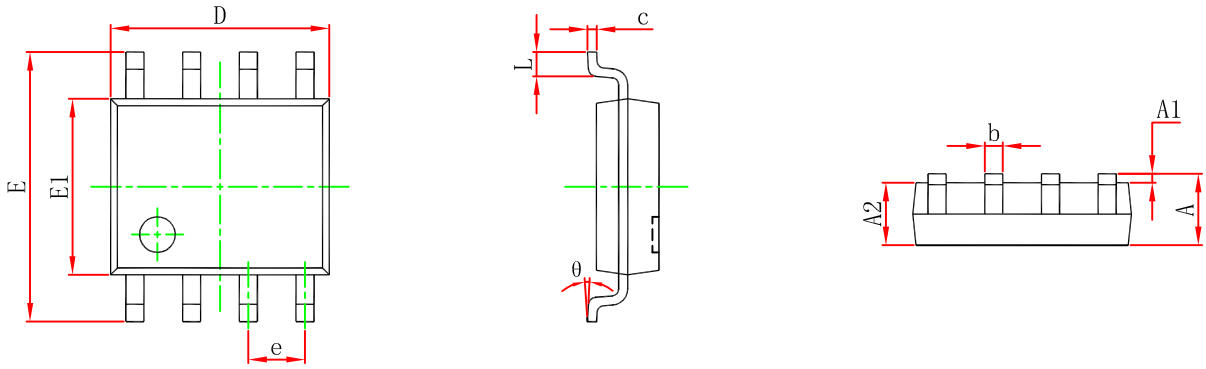
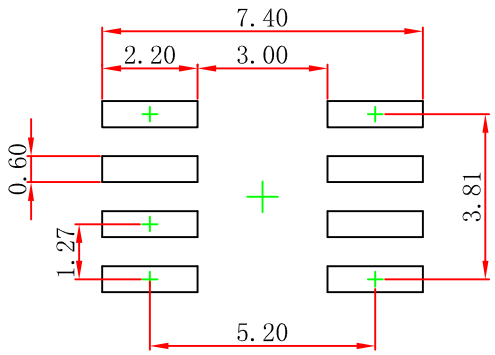


Figure 10. Maximum Safe Operating Area

SOP-8 Package Outline Dimensions



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	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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