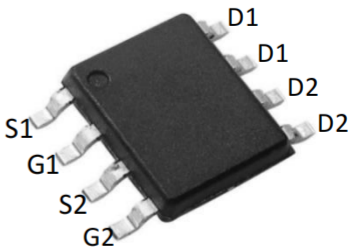
Description：

This N+P Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.



Features：

N-Channel:V_{DS}=30V,I_D=7.5A,$R_{DS(ON)}$<28mΩ @V_{GS}=10V

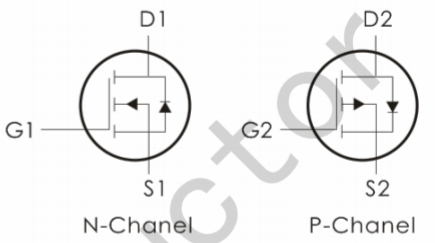
P-Channel: V_{DS}=-30V,I_D=-7A,$R_{DS(ON)}$<52mΩ @V_{GS}=-10V

1) Low gate charge.

2) Green device available.

3) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.

4) Excellent package for good heat dissipation.



Absolute Maximum Ratings：(T_A=25℃ unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D	Continuous Drain Current- T_A=25℃	7.5	-7	A
	Continuous Drain Current-T_A=100℃	6.2	-5.5	
I_{DM}	Pulsed Drain Current note1	64	-40	A
E_{AS}	Single Pulsed Avalanche Energy note2	12	43	mJ
P_D	Power Dissipation - T_A=25℃	2	2	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		℃

Thermal Characteristics：

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62.5	62.5	℃/W

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N-Channel Electrical Characteristics: (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=30V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1	1.5	2.6	V
$R_{DS(ON)}$	Drain-Source On Resistance[note3]	V_{GS}=10V,I_D=7.2A	---	18	28	mΩ
		V_{GS}=4.5V,I_D=5A	---	24	36	
Dynamic Characteristics[4]						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	---	370	447	pF
C_{oss}	Output Capacitance		---	66	---	
C_{rss}	Reverse Transfer Capacitance		---	40	---	
Qg	Gate Charge	V_{GS}=10V V_{DS}=15V I_D=7.2A	---	7.1	10	nc
Qgs	Gate-Source Charge		---	1.2	---	
Qgd	Gate-Drain Charge		---	1.6	---	
Switching Characteristics[4]						
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=15V,R_L=2.1Ω R_{REN}=3Ω,V_{GS}=10V	---	4.4	---	ns
t_r	Rise Time		---	2.6	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	14.8	---	ns
t_f	Fall Time		---	2.8	---	ns
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	VD=VG=0V	---	----	7.5	A
I_{SM}	Pulsed Drain to Source Diode	VD=VG=0V	---	---	64	A

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V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=2.5A	---	0.74	1	V
t_{rr}	Body Diode Reverse Recovery Time	I_F=7.2A,dI/dt=100A/ μ s	---	10.5	12.6	ns
Q_{rr}	Body Diode Reverse Recovery		---	4.5	---	nC

Notes:

1: The value of R θJA is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T A=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

2: Repetitive rating, pulse width limited by junction temperature.

3. The R θJA is the sum of the thermal impedence from junction to lead R θJL and lead to ambient.

4. The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

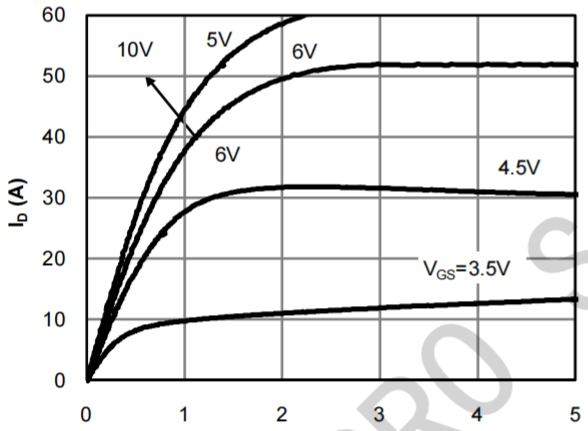

Fig 1: On-Region Characteristics

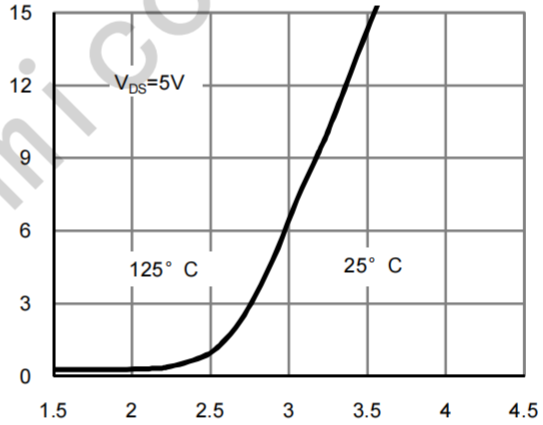

Figure 2: Transfer Characteristics

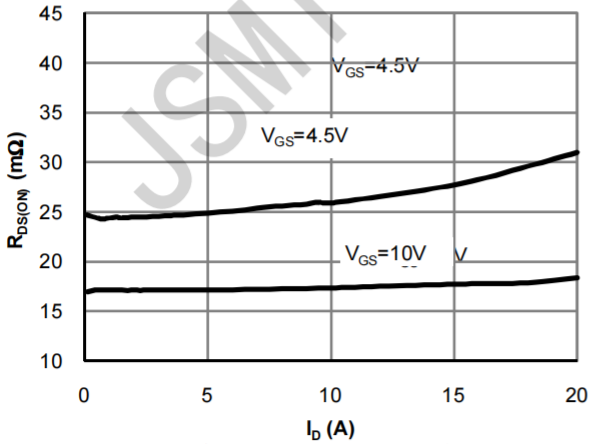

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

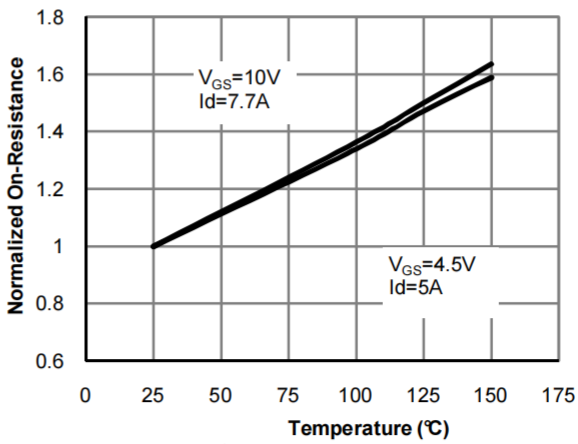

Figure 4: On-Resistance vs. Junction Temperature

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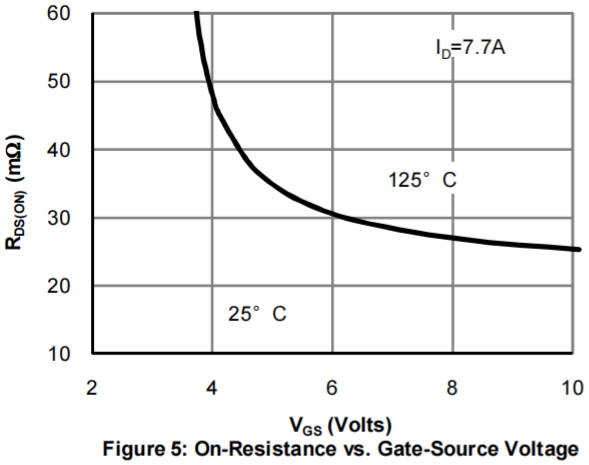

Figure 5: On-Resistance vs. Gate-Source Voltage

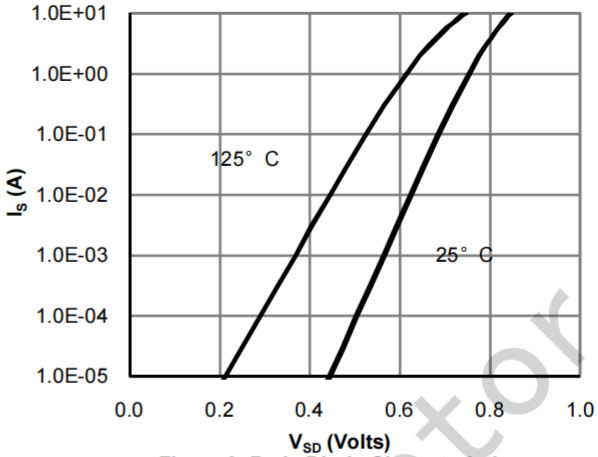

Figure 6: Body-Diode Characteristics

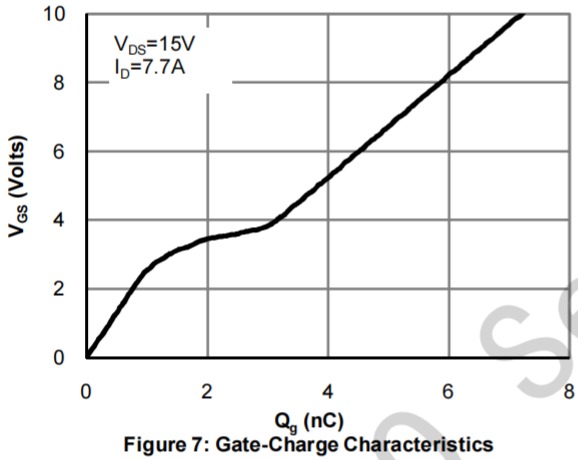

Figure 7: Gate-Charge Characteristics

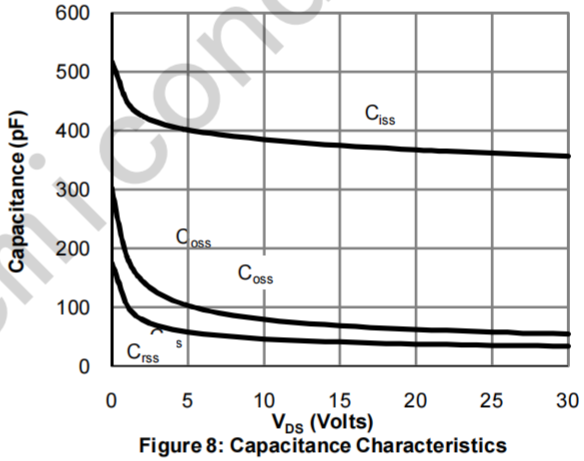

Figure 8: Capacitance Characteristics

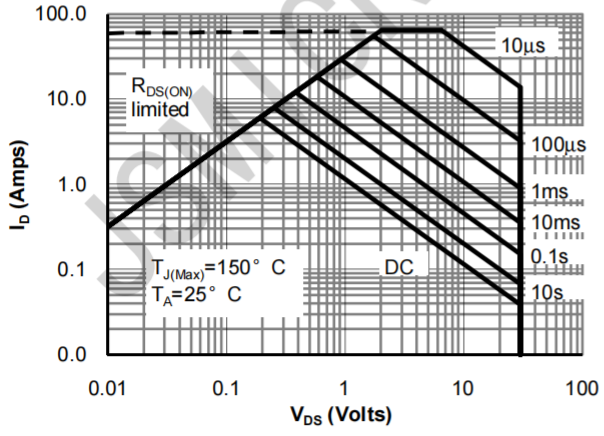

Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

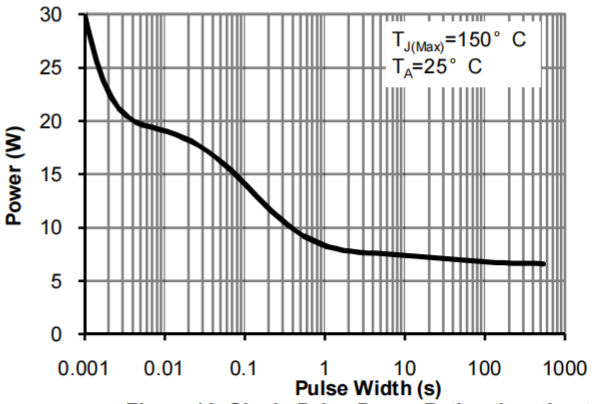

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

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P-Channel Electrical Characteristics: (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	-30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-30V	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	-1	-1.5	-2.4	V
$R_{DS(ON)}$	Drain-Source On Resistance[note3]	V_{GS}=-10V,I_D=-6.3A	---	40	52	mΩ
		V_{GS}=-4.5V,I_D=-4.5A	---	56	65	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz	---	759	---	pF
C_{oss}	Output Capacitance		---	139	---	
C_{rss}	Reverse Transfer Capacitance		---	94	---	
Switching Characteristics[4]						
$t_{d(on)}$	Turn-On Delay Time	V_{GS}= -10V, R_{GEN}=3Ω R_D=15Ω ,V_{DS}=-15V	---	7.9	---	ns
t_r	Rise Time		---	5.9	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	46	---	ns
t_f	Fall Time		---	4	---	ns
Q_g	Total Gate Charge	V_{GS}=-10V,V_{DS}=-15V,I_D=-5.3A	---	13.5	15.9	nC
Q_{gs}	Gate-Source Charge		---	2.5	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	3.1	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	VD=VG=0V	---	---	-7	A
I_{SM}	Pulsed Drain to Source Diode	VD=VG=0V	---	---	-40	A
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=-3.5A	---	-0.8	-1	V
Trr	Reverse Recovery Time	T_J=25℃, I_F=-5.3A,dI/dt=-100A/μs	---	15	---	ns
Qrr	Reverse Recovery Charge		---	9.7	---	nC

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Notes:

1: The value of R θJA is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T A=25℃. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

2: Repetitive rating, pulse width limited by junction temperature.

3. The R θJA is the sum of the thermal impedence from junction to lead R θJL and lead to ambient.

4. The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

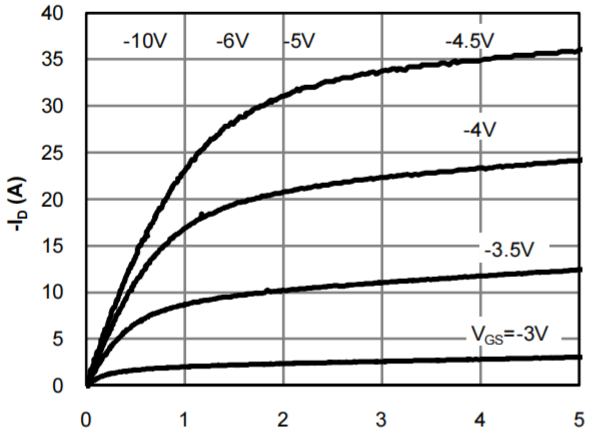

Fig 1: On-Region Characteristics

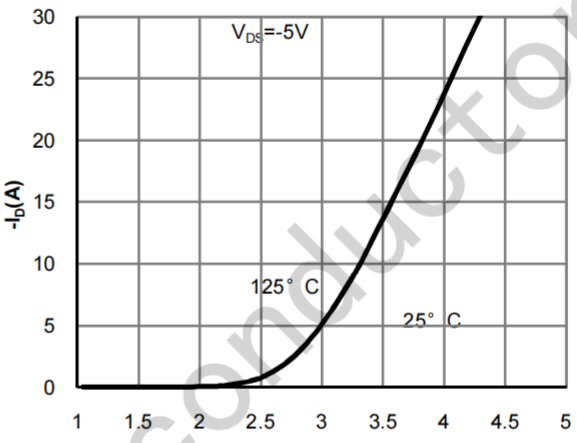

Figure 2: Transfer Characteristics

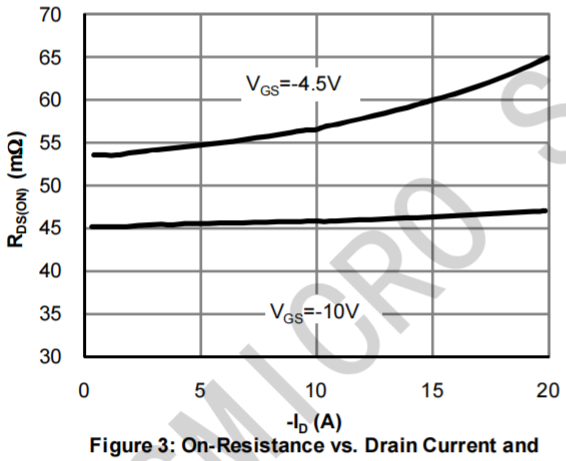

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

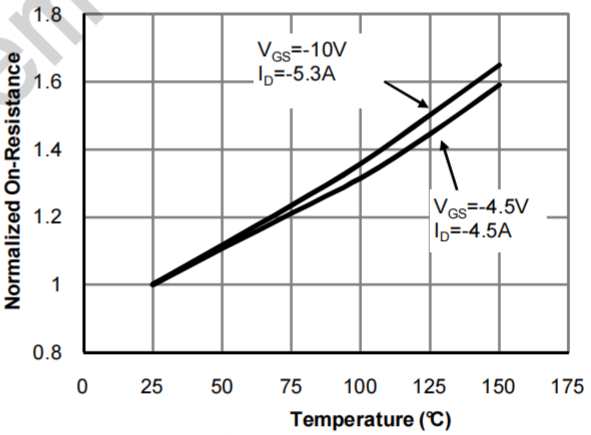

Figure 4: On-Resistance vs. Junction Temperature

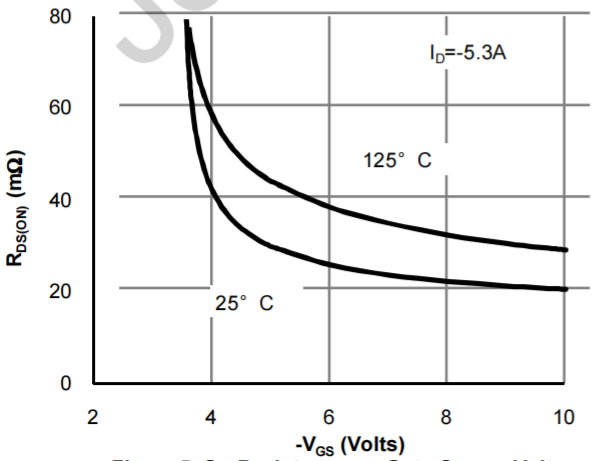

Figure 5: On-Resistance vs. Gate-Source Voltage

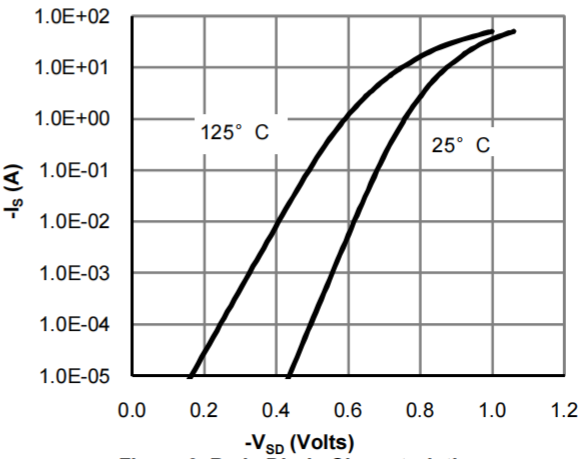

Figure 6: Body-Diode Characteristics

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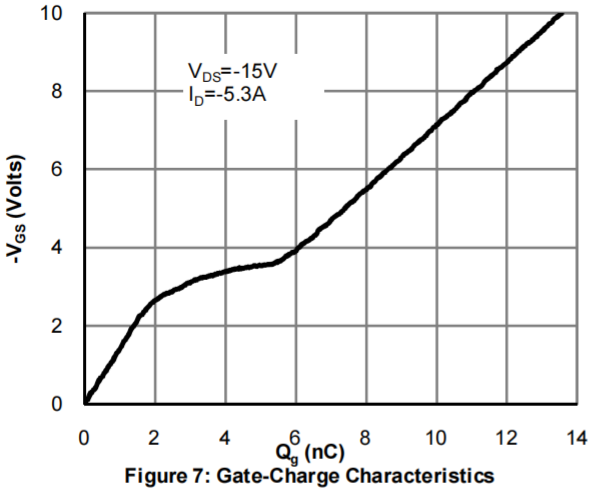

Figure 7: Gate-Charge Characteristics

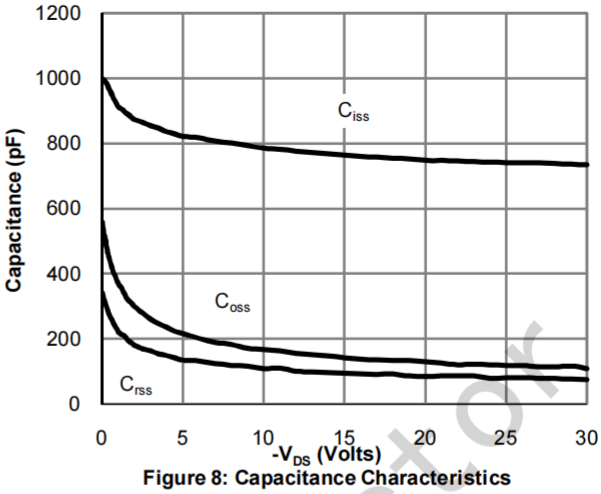

Figure 8: Capacitance Characteristics

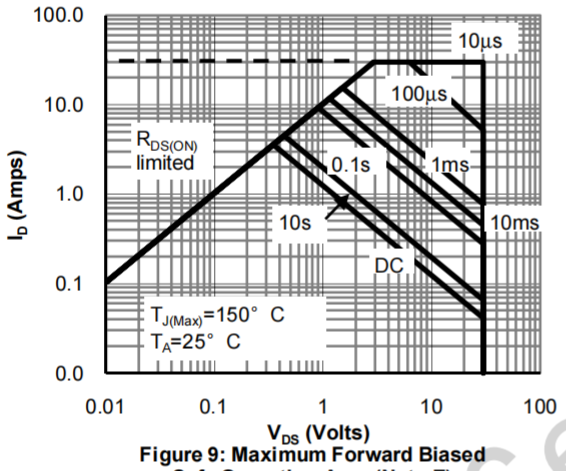

Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

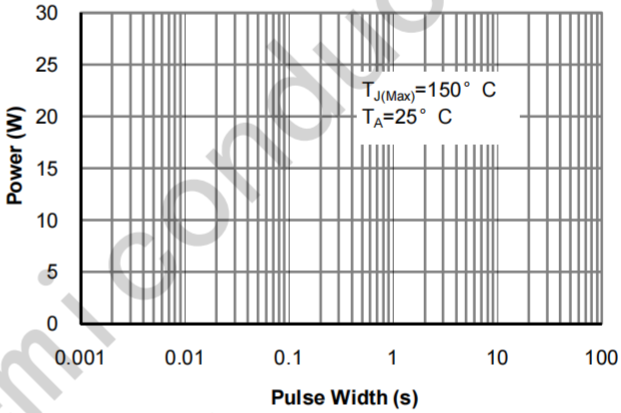

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

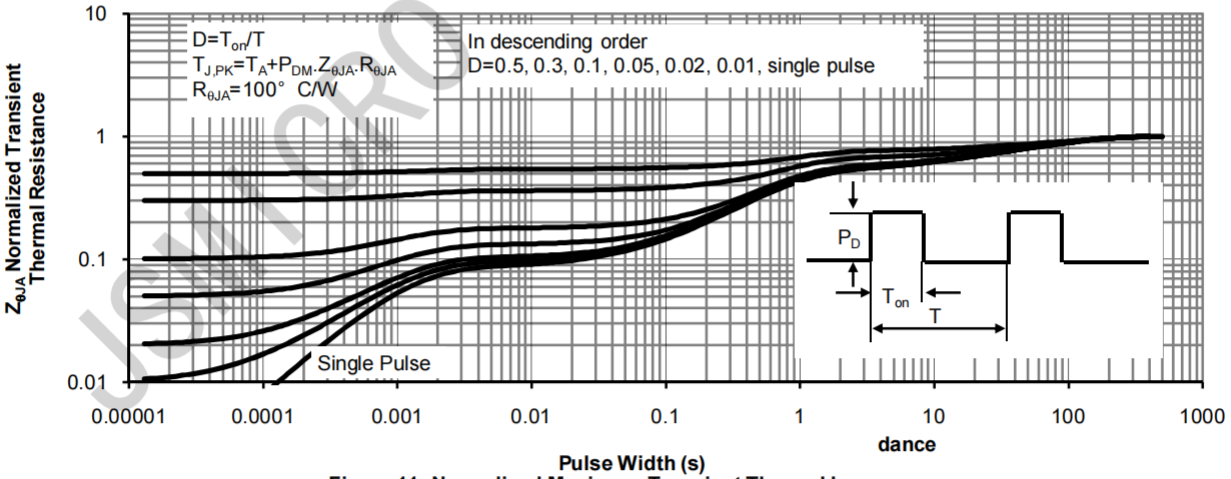

Figure 11: Normalized Maximum Transient Thermal Impe

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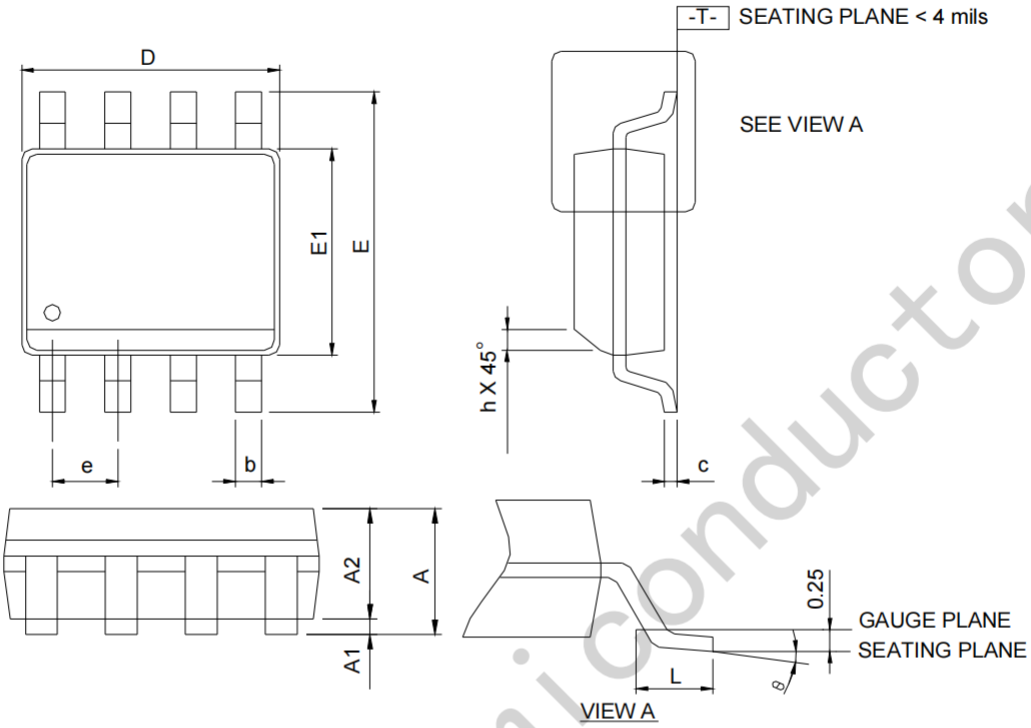
Package Information

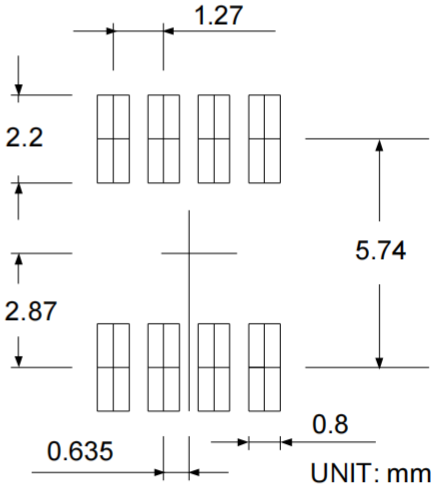
SOP-8



SYMBOL	SOP-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.75	-	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	-	0.049	-
b	0.31	0.51	0.012	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
h	0.25	0.50	0.010	0.020
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°

Note: 1. Follow JEDEC MS-012 AA.
2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
3. Dimension "E" does not include inter-lead flash or protrusions. Inter-lead flash and protrusions shall not exceed 10 mil per side.

RECOMMENDED LAND PATTERN



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