

- **N Channl**

30V/7.2A

$R_{DS(ON)}=18.7m\Omega$ (typ) @VGS=10V

$R_{DS(ON)}=24.8m\Omega$ (typ) @VGS=4.5V

- **P Channl**

-30V/-6.8A

$R_{DS(ON)}=42m\Omega$ (typ) @VGS=10V

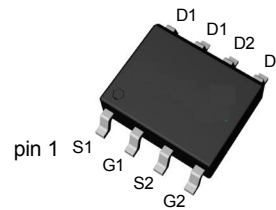
$R_{DS(ON)}=55m\Omega$ (typ) @VGS=4.5V

- 100% UIS & RG Tested

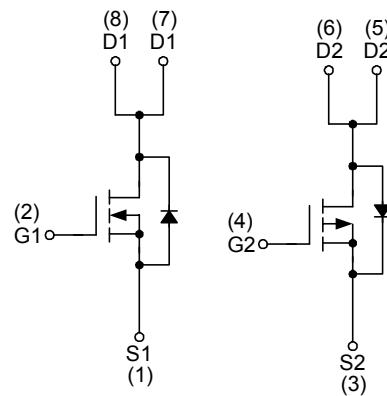
- Reliable and Rugged

- Lead Free and Green Devices Available
(RoHS Compliant)

Pin Description



Top View of SOP-8



N-Channel MOSFET

P-Channel MOSFET

Applications

- Power Management for Industrial DC/DC Converters

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

Symbol	Parameter		N Channl	P Channl	Unit
Common Ratings					
V _{DSS}	Drain-Source Voltage		30	-30	V
V _{GSS}	Gate-Source Voltage		±20	±20	
I _D	Pulsed Drain Current ^F	T _A =25°C	7.2	-6.8	
		T _A =70°C	6.2	-5.5	
I _{DM}	Pulsed Drain Current ^B		64	-40	A
I _S	Diode Continuous Forward Current		2.5	-3.5	A
I _{SM}	Pulsed Body-diode Current ^B		64	-40	
T _j	Maximum Junction Temperature		150		°C
T _{STG}	Storage Temperature Range		-55 to 150		
P _D	Power Dissipation ^F	T _A =25°C	2	2	W
		T _A =70°C	1.44	1.44	
R _{θJA}	Thermal Resistance-Junction to Ambient ^A	t≤10S	62.5	62.5	°C/W
		Steady State ^C	100	100	
R _{θJL}	Thermal Resistance-Junction to Lead ^C		40	40	°C/W
E _{AS}	Single pulsed avalanlce energy ^B	L=0.3mH	12	43	Mj
I _{AS}	Single pulsed avalanlce Current		9	17	A

A: The value of R_{θJA} is measured with the device mounted on 1in² 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.

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

C: The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

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

E: These tests are performed with the device mounted on 1 in ² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C. The SOA curve provides a single pulse rating.

F: The power dissipation and current rating are based on the t ≤ 10s thermal resistance rating.

H. Rg detail test condition: VGS=0V, VDS=0V, Vosc=0.5V, f=1MHZ, CS is 0.001nF to 1000nF(CS limit is only for checking test contact)

Setup the test condition on Rg tester, then get the Rg value.

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0V	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V T _J =55°C			1 5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±20V			100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} I _D =250μA	1.0	1.5	2.6	V
I _{D(ON)}	On state drain current	V _{GS} =10V, V _{DS} =5V	64			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =7.2A		18.7	28	mΩ
		T _J =125°C		25	32	
		V _{GS} =4.5V, I _D =5A		24.8	36	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =7.2A		20		S
V _{SD}	Diode Forward Voltage	I _S =2.5A, V _{GS} =0V		0.74	1	V
I _S	Maximum Body-Diode Continuous Current				2.5	A
I _{SM}	Pulsed Body-Diode Current ^B				64	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		373	448	pF
C _{oss}	Output Capacitance			67		pF
C _{rss}	Reverse Transfer Capacitance			41		pF
R _g (Note.H)	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		1.8	2.8	Ω
SWITCHING PARAMETERS						
Q _g (10V)	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =7.2A		7.2	11	nC
Q _g (4.5V)	Total Gate Charge			3.5		nC
Q _{gs}	Gate Source Charge			1.3		nC
Q _{gd}	Gate Drain Charge			1.7		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =15V, R _L =2.1Ω, R _{GEN} =3Ω		4.5		ns
t _r	Turn-On Rise Time			2.7		ns
t _{D(off)}	Turn-Off DelayTime			14.9		ns
t _f	Turn-Off Fall Time			2.9		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =7.2A, dI/dt=100A/μs		10.5	12.6	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =7.2A, dI/dt=100A/μs		4.5		nC

A: The value of R_{θJA} is measured with the device mounted on 1in² 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.

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

C: The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

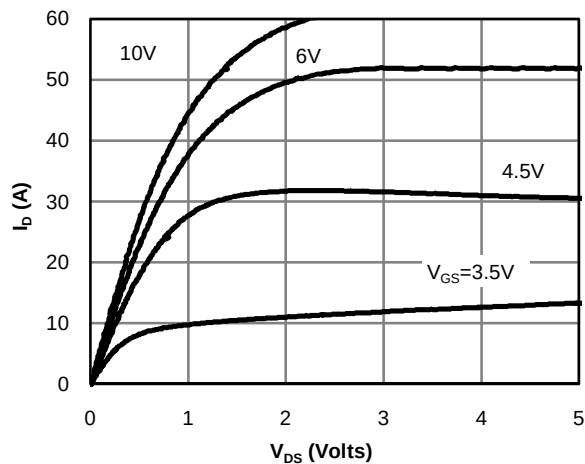
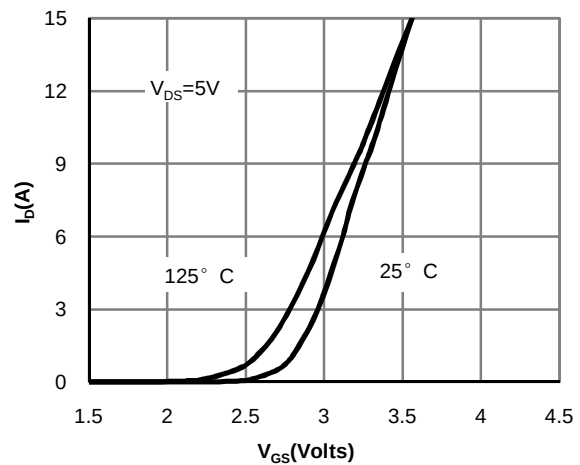
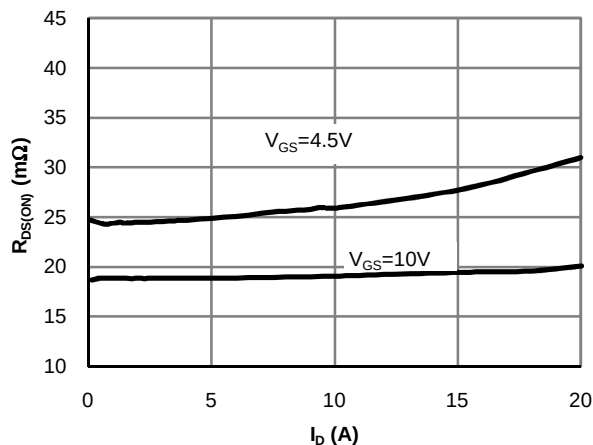
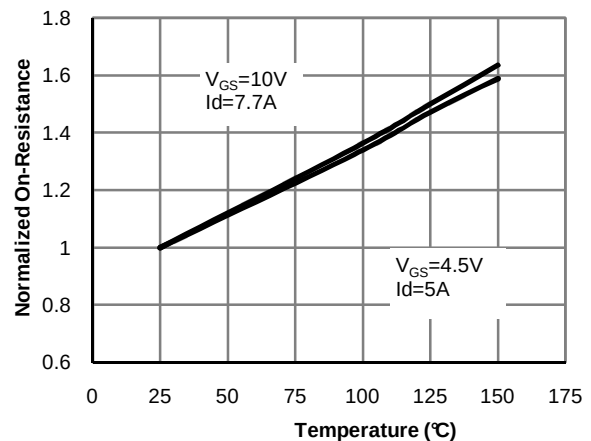
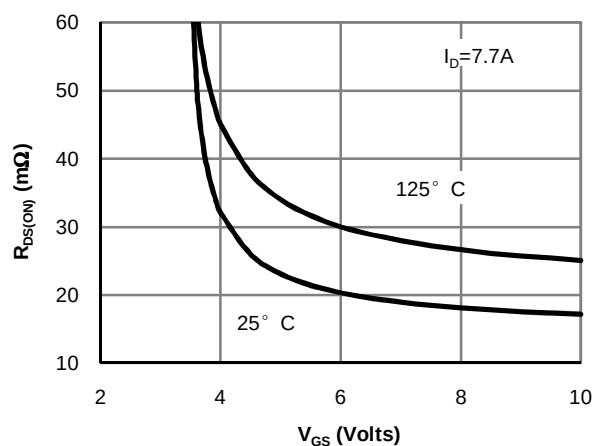
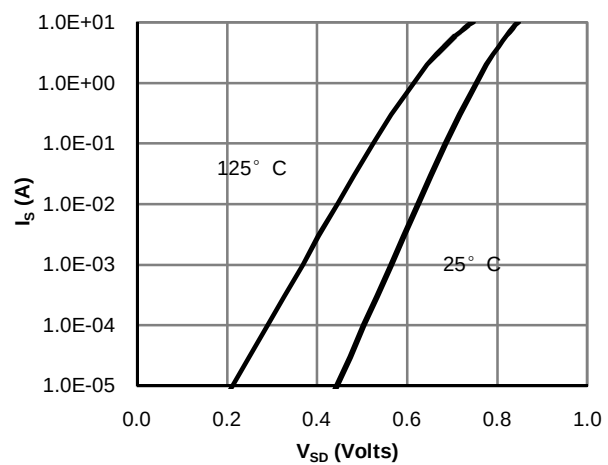
D: The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

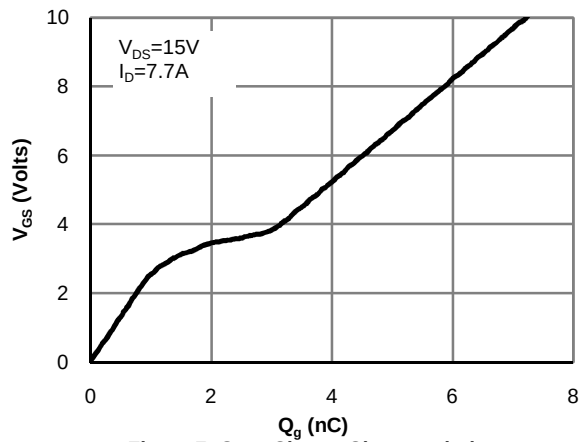
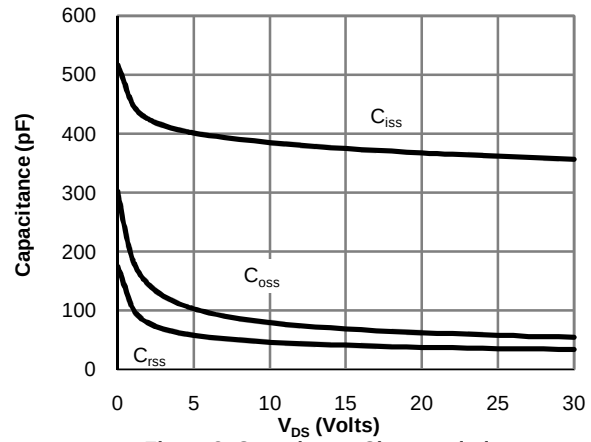
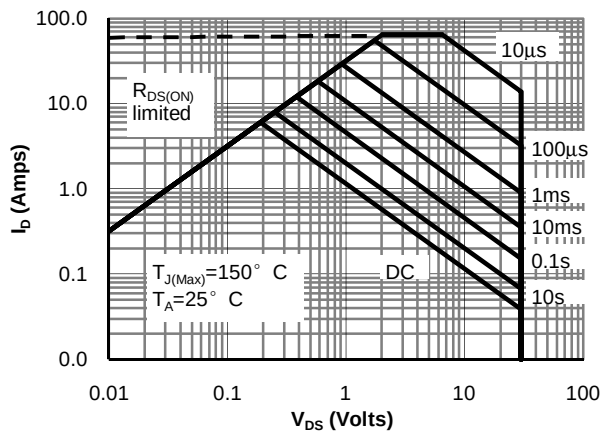
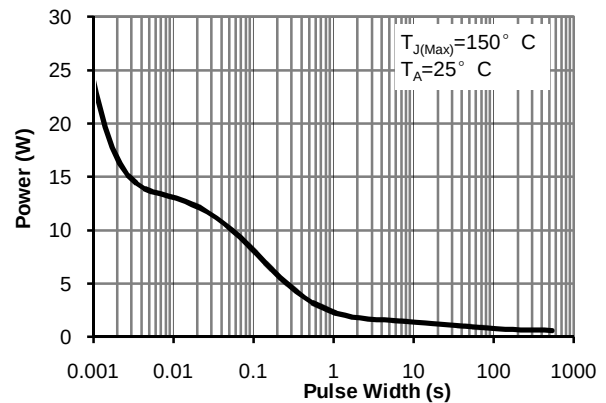
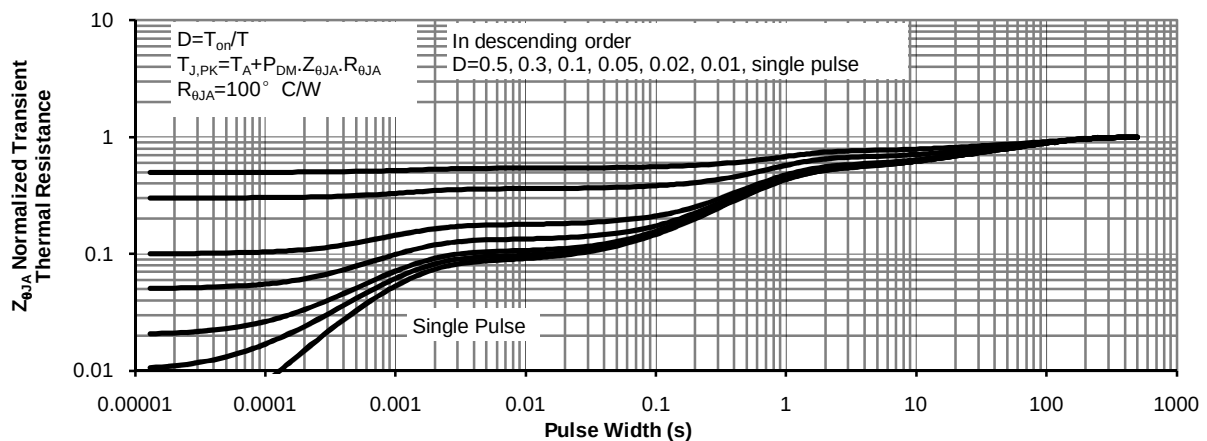
E: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C. The SOA curve provides a single pulse rating.

F: The power dissipation and current rating are based on the t ≤ 10s thermal resistance rating.

H: R_g detail test condition: V_{GS}=0V, V_{DS}=0V, V_{osc}=0.5V, f=1MHZ, CS is 0.001nF to 1000nF(CS limit is only for checking test contact)

Setup the test condition on R_g tester, then get the R_g value.

N-CHANNEL TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

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

N-CHANNEL TYPICAL ELECTRICAL AND THERMAL 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)

Figure 11: Normalized Maximum Transient Thermal Impedance

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =-250μA, V _{GS} =0V	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V T _J =55°C			-1 -5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±20V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-1.50	-2.4	V
I _{D(ON)}	On state drain current	V _{GS} =-10V, V _{DS} =-5V	-40			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-6.3A T _J =125°C		42 41.5	52	mΩ
		V _{GS} =-4.5V, I _D =-4.5A		55	65	mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-5.3A		19		S
V _{SD}	Diode Forward Voltage	I _S =-3.5A, V _{GS} =0V		-0.8	-1	V
I _S	Maximum Body-Diode Continuous Current				-3.5	A
I _{SM}	Pulsed Body-Diode Current ^B				-40	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, f=1MHz		760		pF
C _{oss}	Output Capacitance			140		pF
C _{rss}	Reverse Transfer Capacitance			95		pF
R _g (Note.H)	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		3.2	5	Ω
SWITCHING PARAMETERS						
Q _g (10V)	Total Gate Charge (10V)	V _{GS} =-10V, V _{DS} =-15V, I _D =-5.3A		13.6	16	nC
Q _g (4.5V)	Total Gate Charge (4.5V)			6.7		nC
Q _{gs}	Gate Source Charge			2.5		nC
Q _{gd}	Gate Drain Charge			3.2		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =-10V, V _{DS} =-15V, R _L =2.8Ω, R _{GEN} =3Ω		8		ns
t _r	Turn-On Rise Time			6		ns
t _{D(off)}	Turn-Off DelayTime			17		ns
t _f	Turn-Off Fall Time			5		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =-5.3A, dI/dt=100A/μs		15		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-5.3A, dI/dt=100A/μs		9.7		nC

A: The value of R_{θJA} is measured with the device mounted on 1in² 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.

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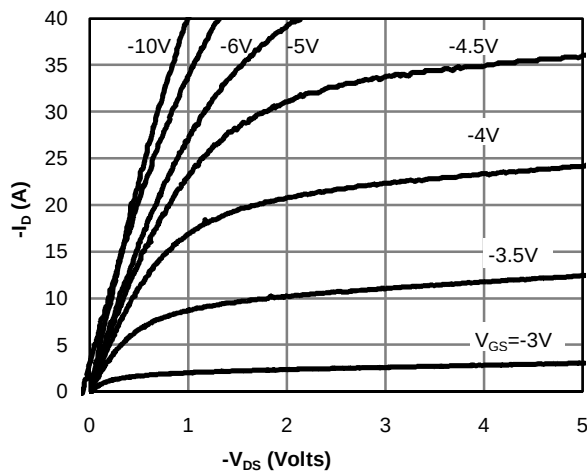
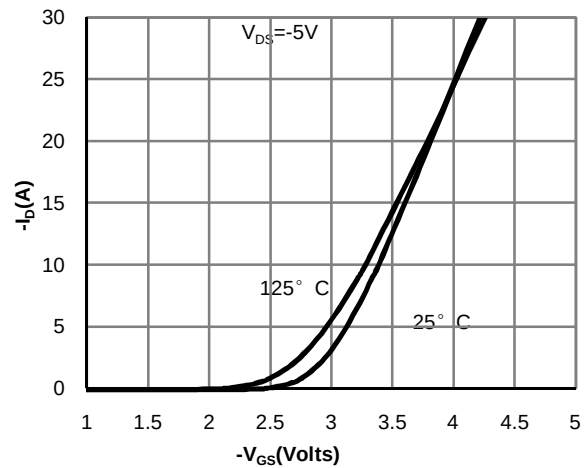
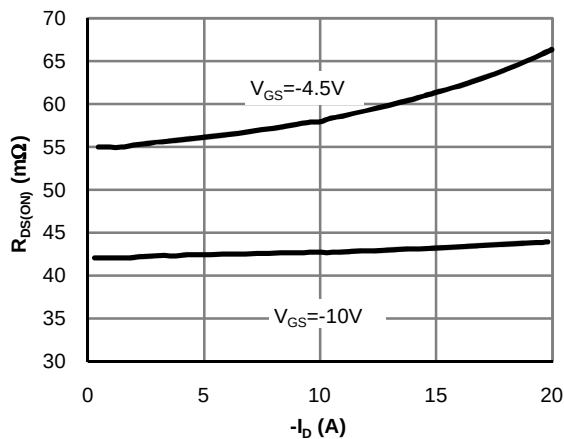
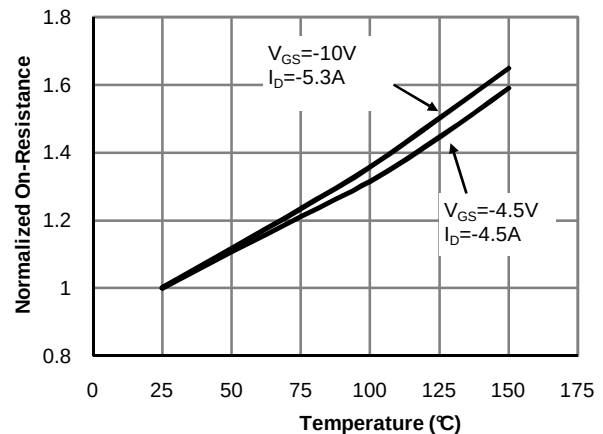
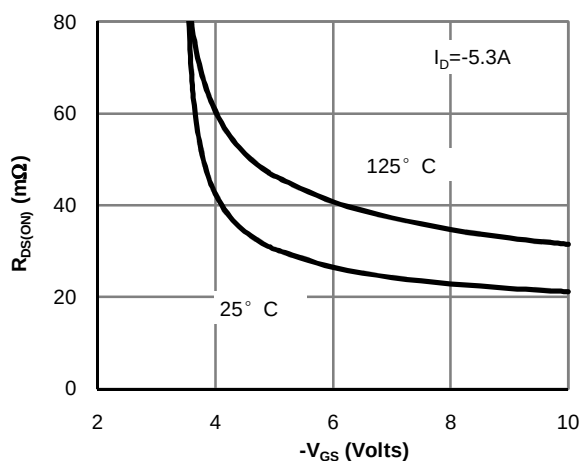
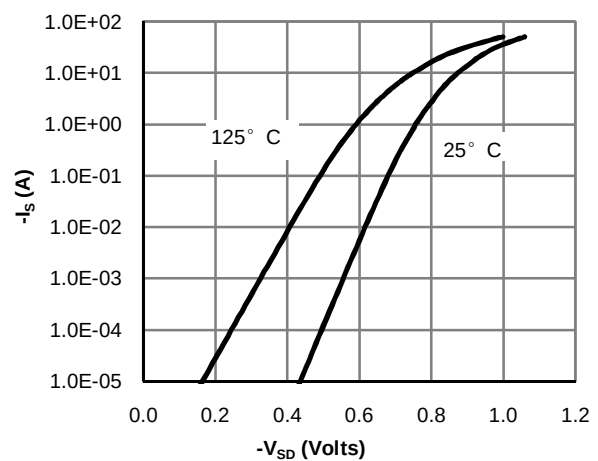
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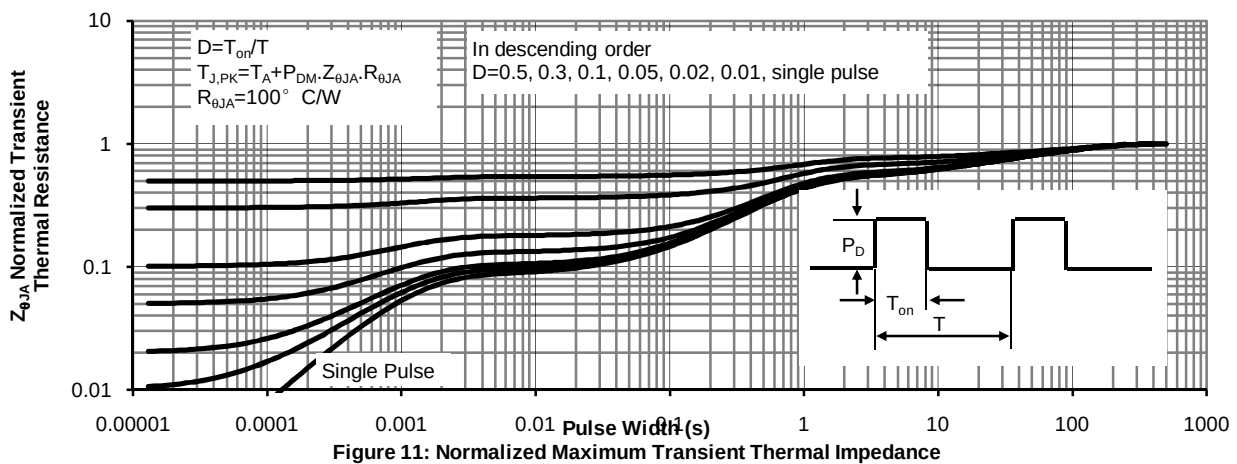
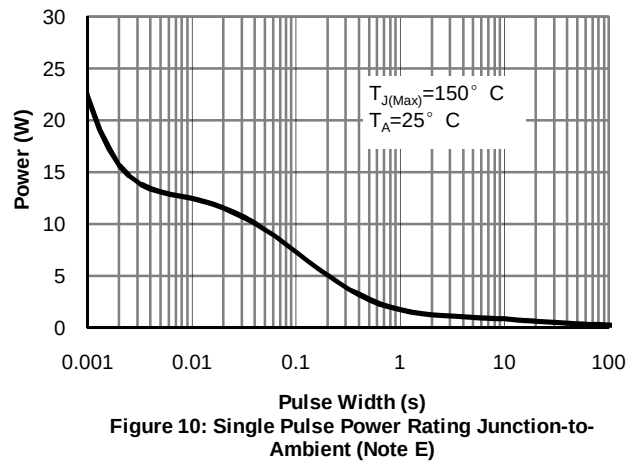
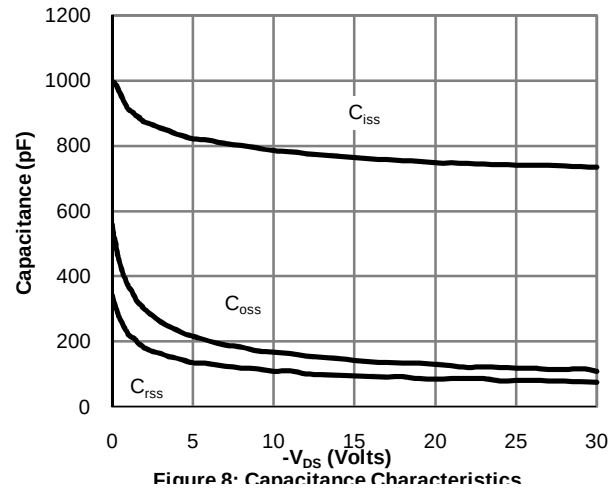
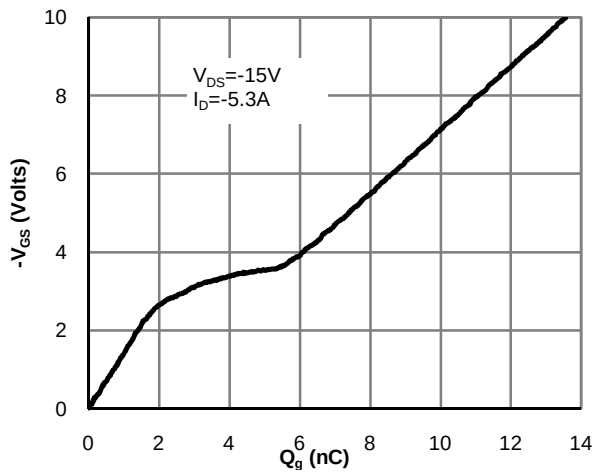
F: The current rating is based on the t ≤ 10s thermal resistance rating.

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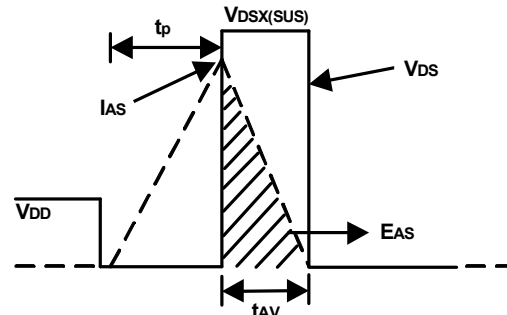
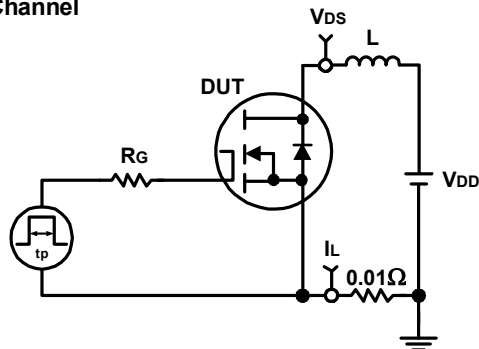
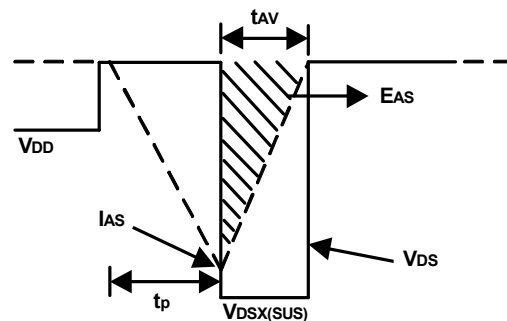
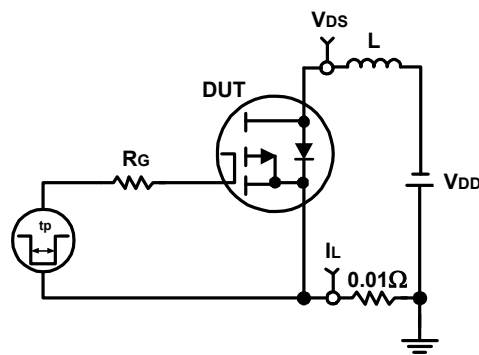
Setup the test condition on R_g tester, then get the R_g value.

P-CHANNEL TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

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

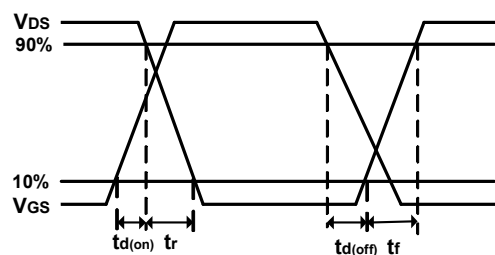
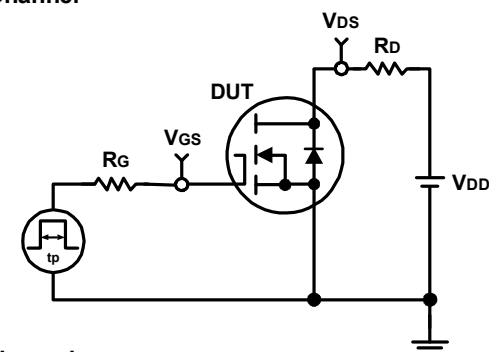
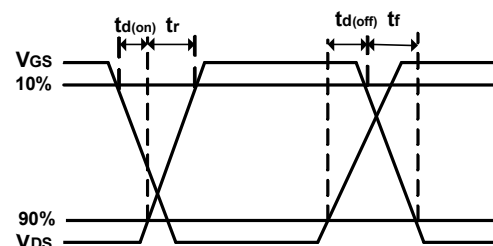
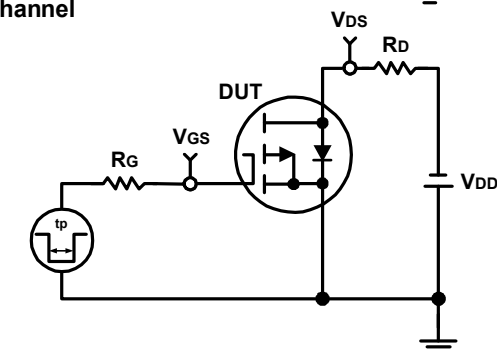
P-CHANNEL TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



Avalanche Test Circuit and Waveforms

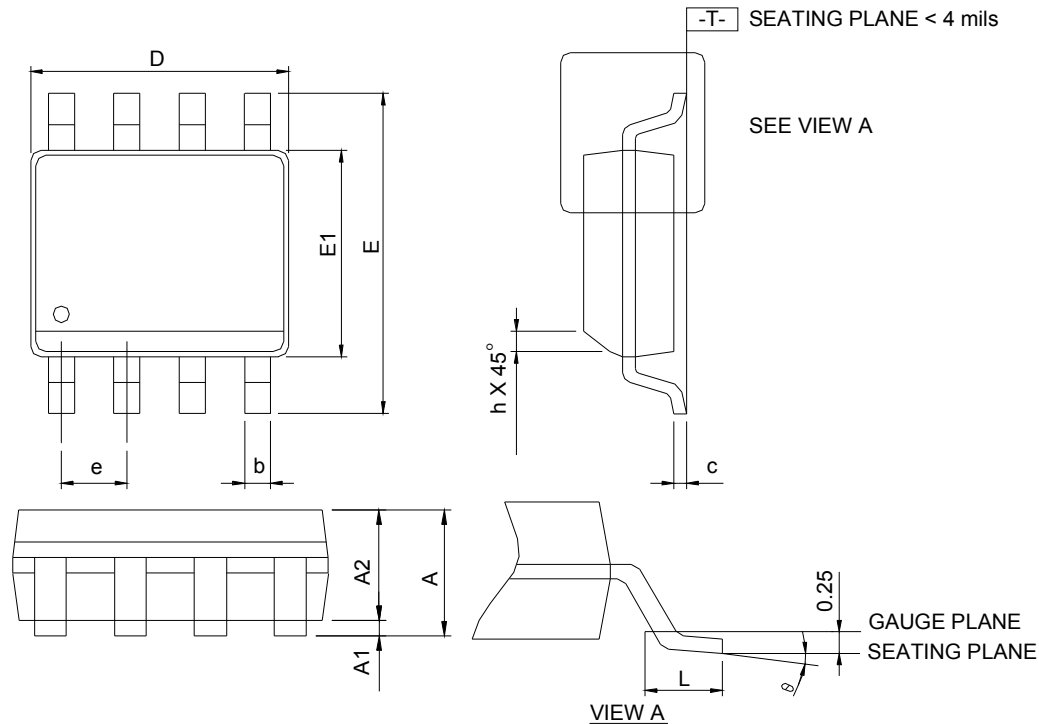
N Channel

P Channel


Switching Time Test Circuit and Waveforms

N Channel

P Channel


Package Information

SOP-8



SOP-8	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

