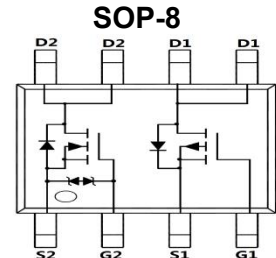
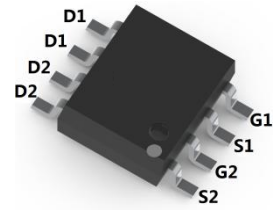


**COMPLEMENTARY MOSFET**
**FEATURES**

- $V_{DS}=30V, I_D=8A, R_{DS(ON)} \leq 20m\Omega @ V_{GS}=10V$
- $V_{DS}=-30V, I_D=-7A, R_{DS(ON)} \leq 22m\Omega @ V_{GS}=-10V$
- Low gate charge and Ultra low on-resistance
- For low Input Voltage inverter applications
- Surface Mount device

**MECHANICAL DATA**

- Case: SOP-8
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.3 grams (approximate)


**MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise noted)**

Parameter	Symbol	Max N-channel	Max P-channel	Unit	
Drain-source voltage	V <sub>DS</sub>	30	-30	V	
Gate-source voltage	V <sub>GS</sub>	±20	±20	V	
Continuous drain current	I <sub>D</sub>	T <sub>A</sub> = 25°C	8	-7	A
		T <sub>A</sub> = 70°C	6.5	-6	A
Pulsed drain current	I <sub>DM</sub>	40	-40	A	
Avalanche current	I <sub>AS, I<sub>AR</sub></sub>	19	27	A	
Avalanche energy L=0.1mH	E <sub>AS, E<sub>AR</sub></sub>	18	36	mJ	
Power dissipation	P <sub>D</sub>	T <sub>A</sub> = 25°C	2	2	W
		T <sub>A</sub> = 70°C	1.3	1.3	W
Thermal resistance from Junction to ambient	R <sub>θJA</sub>	90		°C/W	
Thermal resistance from Junction to Lead	R <sub>θJL</sub>	40		°C/W	
Junction temperature	T <sub>J</sub>	150		°C	
Storage temperature	T <sub>STG</sub>	-55 ~+150		°C	

**N-CHANNEL ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Drain-Source breakdown voltage	V <sub>(BR)DSS</sub> *	30			V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
Zero gate voltage drain current	I <sub>DSS</sub> *			1	μA	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V
Gate-body leakage current	I <sub>GSS</sub> *			±10	μA	V <sub>DS</sub> =0V, V <sub>GS</sub> =±16V
Gate-threshold voltage	V <sub>GS(th)</sub> *	1.2	1.8	2.4	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
On-State Drain Current	I <sub>D(ON)</sub>	40			A	V <sub>DS</sub> =5V, V <sub>GS</sub> =10V
Drain-source on-resistance	R <sub>DS(ON)</sub> *		16.5	20	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =8A
			23	28	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =8A, T <sub>J</sub> =125°C
			19.5	28	mΩ	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A
Forward transconductance	g <sub>FS</sub>		30		S	V <sub>DS</sub> =5V, I <sub>D</sub> =8A
Diode forward voltage	V <sub>SD</sub>		0.75	1	V	I <sub>S</sub> =1A, V <sub>GS</sub> =0V
Diode forward current	I <sub>S</sub>			2.5	A	
Input capacitance	C <sub>iss</sub>	600	740	888	pF	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz
Output capacitance	C <sub>oss</sub>	77	110	145	pF	
Reverse transfer capacitance	C <sub>rss</sub>	50	82	115	pF	
Gate resistance	R <sub>g</sub>	0.5	1.1	1.7	Ω	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz
Total gate charge	Q <sub>g</sub>	6	7.5	9	nC	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =15V, I <sub>D</sub> =8A
Total gate charge		12	15	18	nC	
Gate-source charge	Q <sub>gs</sub>		2.5		nC	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =8A
Gate-drain charge	Q <sub>gd</sub>		3		nC	
Turn-on delay time	t <sub>d(on)</sub>		5		nS	
Turn-on rise time	t <sub>r</sub>		3.5		nS	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>GEN</sub> =3Ω, R <sub>L</sub> =1.8Ω
Turn-off delay time	t <sub>d(off)</sub>		19		nS	
Turn-off fall time	t <sub>f</sub>		3.5		nS	
Body Diode Reverse Recovery Time	t <sub>rr</sub>	6	8	10	nS	I <sub>F</sub> =8A, di/dt=500A/μS
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	14	18	22	nC	I <sub>F</sub> =8A, di/dt=500A/μS

\*Pulse test ; Pulse width ≤300μs, Duty cycle ≤ 0.5% .

COMPLEMENTARY MOSFET

**N-Channel: TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

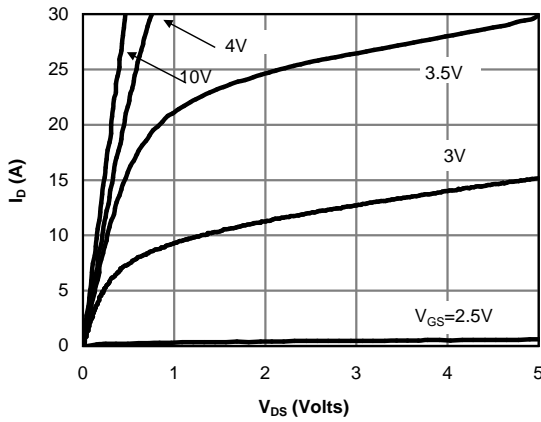


Fig 1: On-Region Characteristics

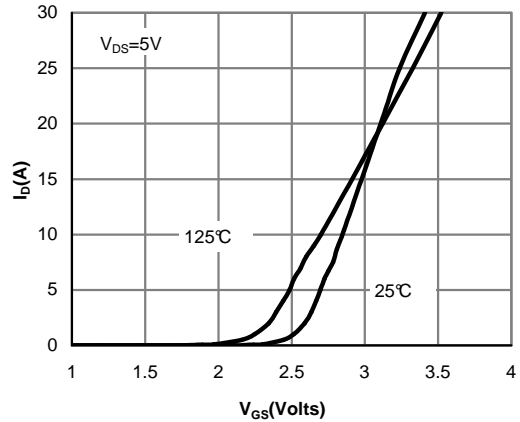


Figure 2: Transfer Characteristics

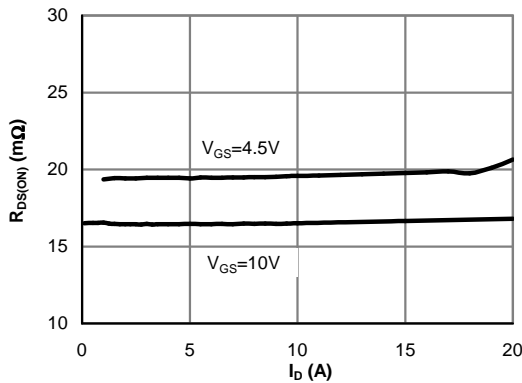


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

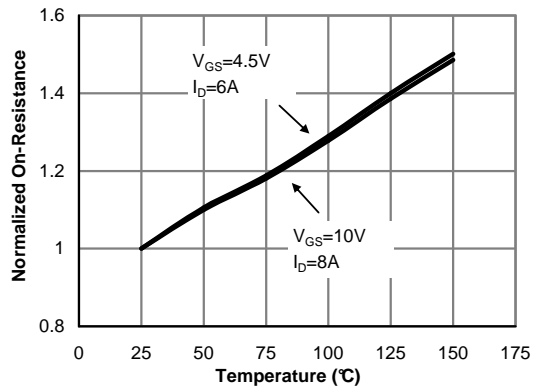


Figure 4: On-Resistance vs. Junction Temperature

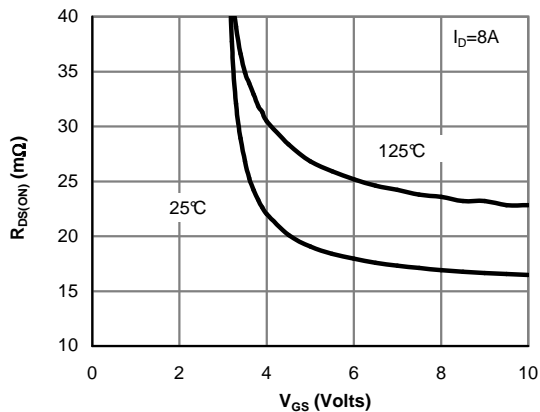


Figure 5: On-Resistance vs. Gate-Source Voltage

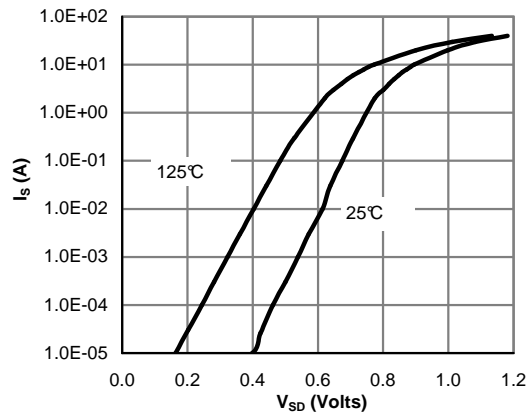


Figure 6: Body-Diode Characteristics

COMPLEMENTARY MOSFET

**N-Channel: TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

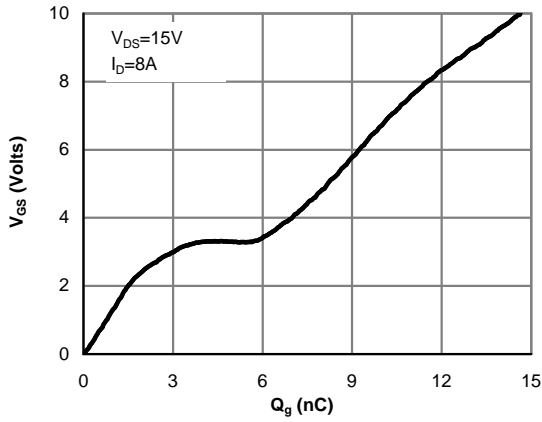


Figure 7: Gate-Charge Characteristics

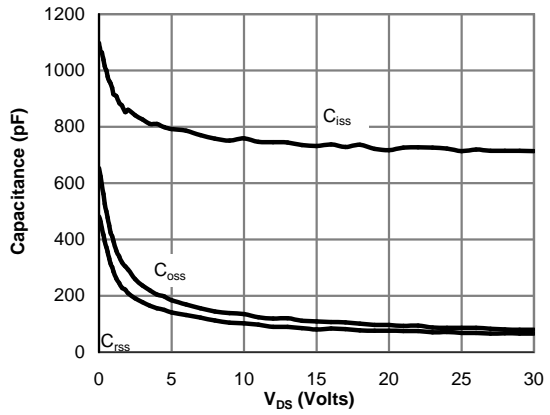


Figure 8: Capacitance Characteristics

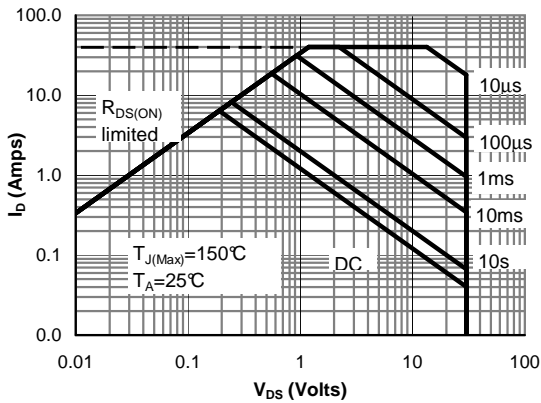


Figure 9: Maximum Forward Biased Safe Operating Area

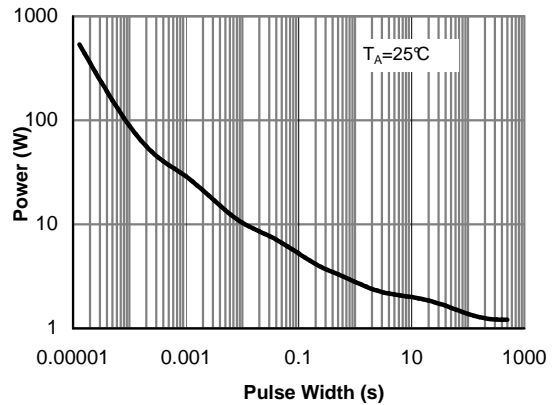


Figure 10: Single Pulse Power Rating Junction-to-Ambient

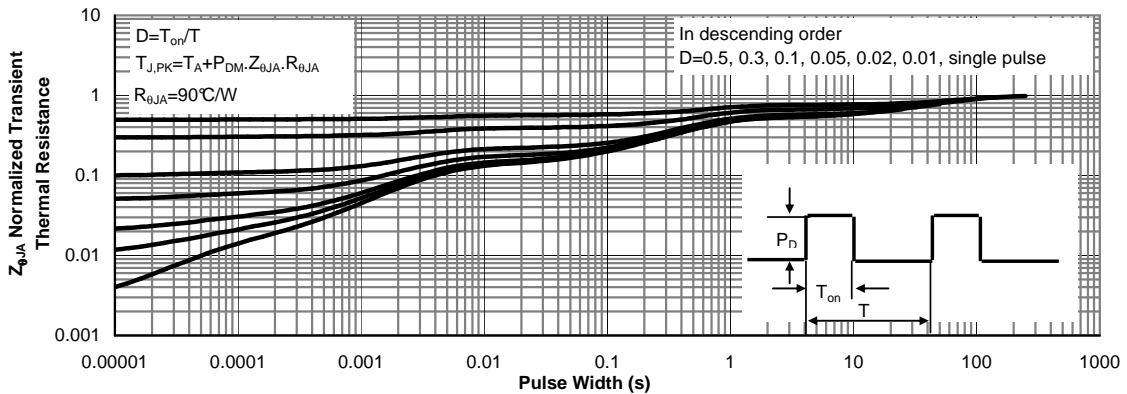
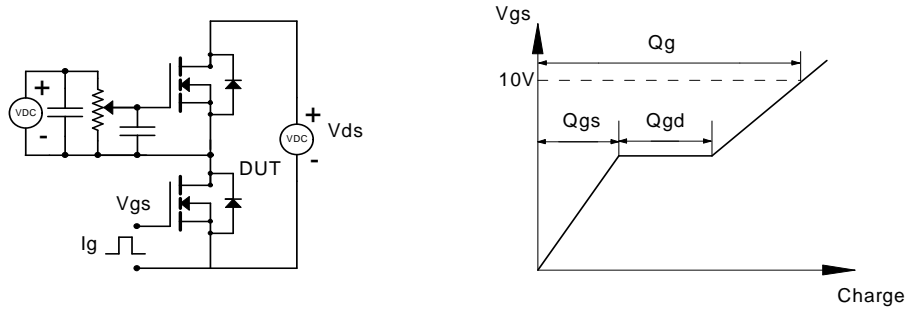


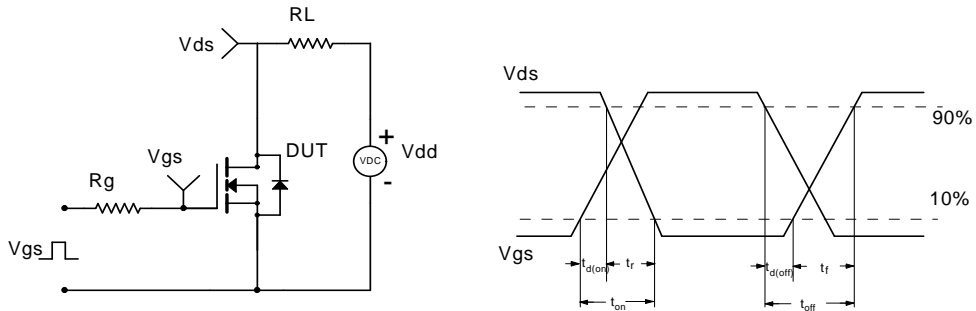
Figure 11: Normalized Maximum Transient Thermal Impedance

COMPLEMENTARY MOSFET

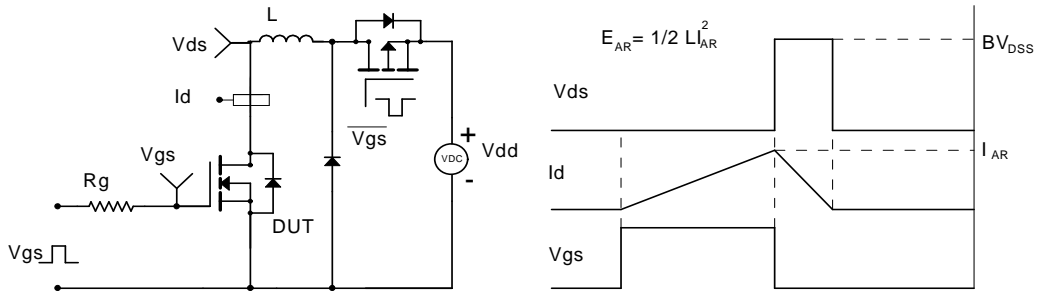
Gate Charge Test Circuit & Waveform



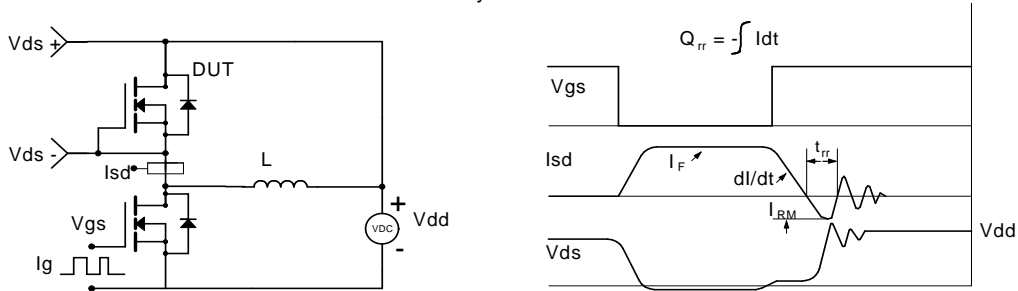
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



**COMPLEMENTARY MOSFET**
**P-CHANNEL ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Drain-Source breakdown voltage	V <sub>(BR)DSS</sub> *	-30			V	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA
Zero gate voltage drain current	I <sub>DSS</sub> *			-1	μA	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V
Gate-body leakage current	I <sub>GSS</sub> *			±100	nA	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V
Gate-threshold voltage	V <sub>GS(th)</sub> *	-1.4	-2.0	-2.5	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA
On-State Drain Current	I <sub>D(ON)</sub> *	-40			A	V <sub>DS</sub> =-5V, V <sub>GS</sub> =-10V
Drain-source on-resistance	R <sub>DS(ON)</sub> *		22	28	mΩ	V <sub>GS</sub> =-10V, I <sub>D</sub> =-7A
			32	40	mΩ	V <sub>GS</sub> =-10V, I <sub>D</sub> =-7A, T <sub>J</sub> =125°C
			34	44	mΩ	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.5A
Forward transconductance	g <sub>FS</sub>		24		S	V <sub>DS</sub> =-5V, I <sub>D</sub> =-7A
Diode forward voltage	V <sub>SD</sub>		-0.75	-1	V	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V
Diode forward current	I <sub>S</sub>			-2.5	A	
Input capacitance	C <sub>iSS</sub>	830	1040	1250	pF	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHz
Output capacitance	C <sub>oSS</sub>	125	180	235	pF	
Reverse transfer capacitance	C <sub>rSS</sub>	75	125	175	pF	
Gate resistance	R <sub>g</sub>	2	4	6	Ω	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz
Total gate charge	Q <sub>g</sub>	7.5	9.6	12	nC	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-7A
Total gate charge		15	19	23	nC	
Gate-source charge	Q <sub>gs</sub>		3.6		nC	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-7A
Gate-drain charge	Q <sub>gd</sub>		4.6		nC	
Turn-on delay time	t <sub>d(on)</sub>		10		nS	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>GEN</sub> =3Ω, R <sub>L</sub> =2.2Ω
Turn-on rise time	t <sub>r</sub>		5.5		nS	
Turn-off delay time	t <sub>d(off)</sub>		26		nS	
Turn-off fall time	t <sub>f</sub>		9		nS	
Body Diode Reverse Recovery Time	t <sub>rr</sub>		11.5	15	nS	I <sub>F</sub> =-7A, dI/dt=500A/μs
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		25	32.5	nC	I <sub>F</sub> =-7A, dI/dt=500A/μs

\*Pulse test ; Pulse width ≤300μs, Duty cycle ≤ 0.5% .

COMPLEMENTARY MOSFET

P-Channel: TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

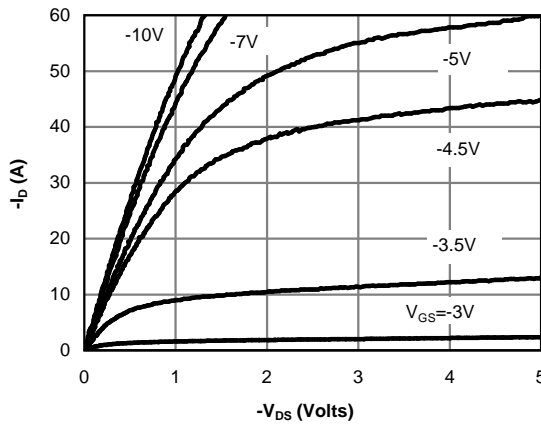


Fig 1: On-Region Characteristics

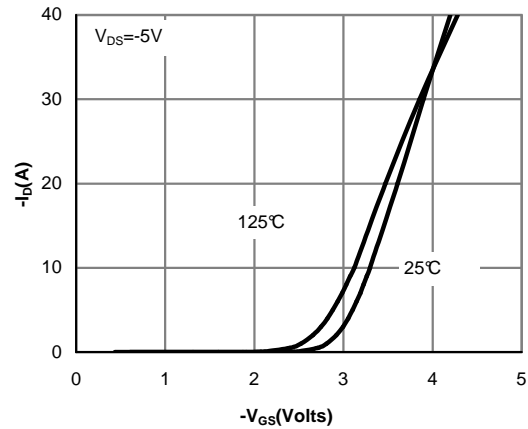


Figure 2: Transfer Characteristics

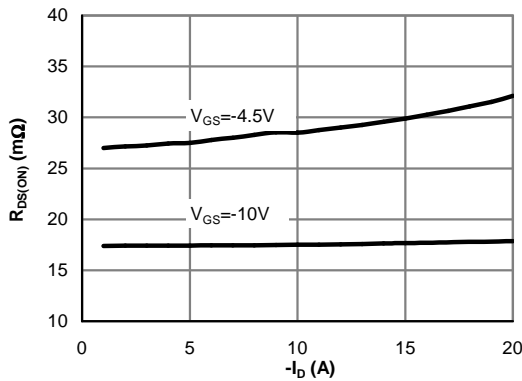


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

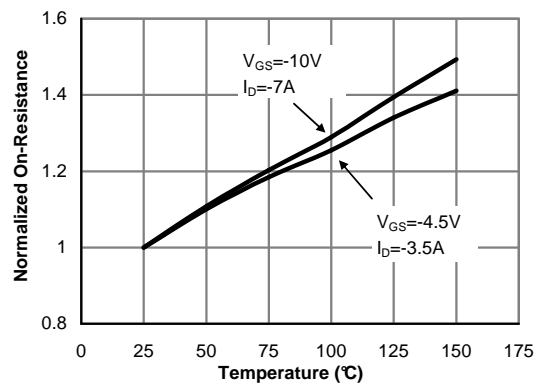


Figure 4: On-Resistance vs. Junction Temperature

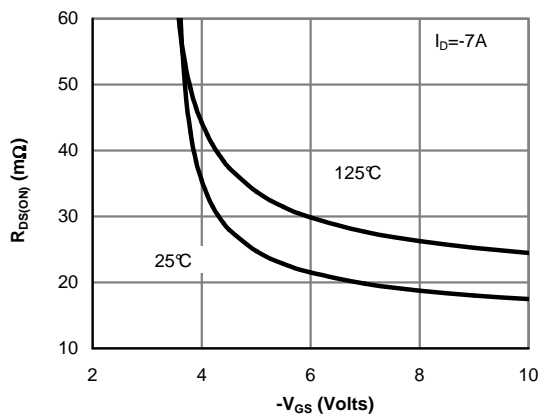


Figure 5: On-Resistance vs. Gate-Source Voltage

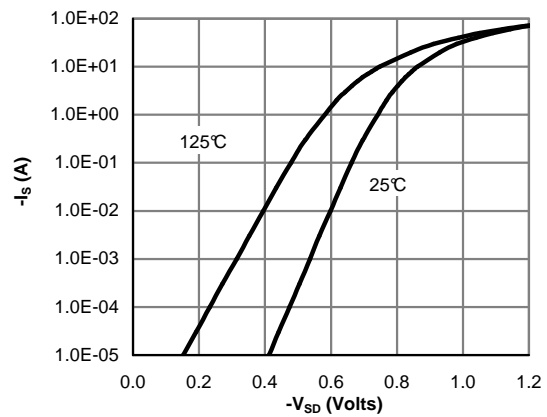


Figure 6: Body-Diode Characteristics

COMPLEMENTARY MOSFET

P-Channel: TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

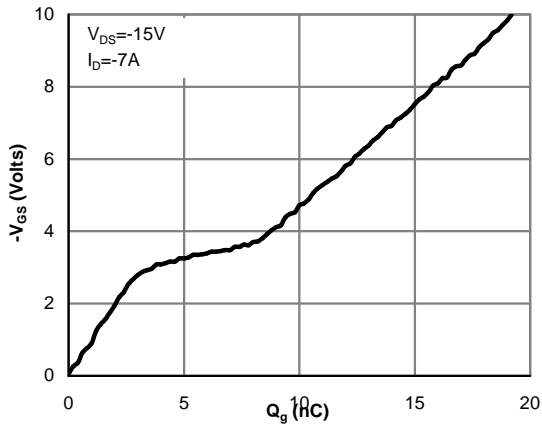


Figure 7: Gate-Charge Characteristics

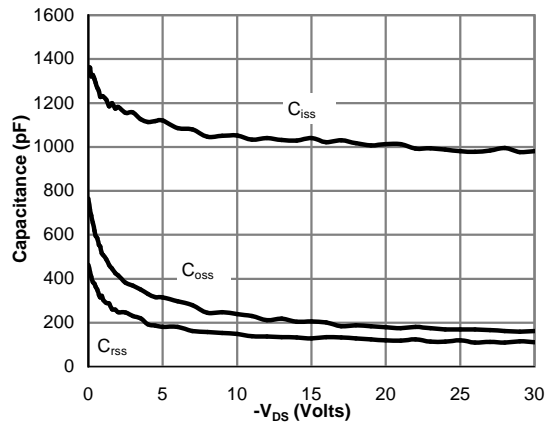


Figure 8: Capacitance Characteristics

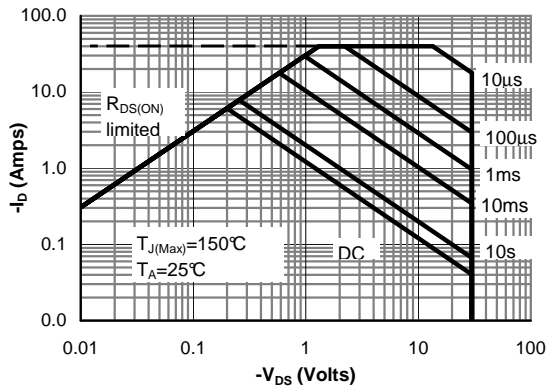


Figure 9: Maximum Forward Biased Safe Operating Area

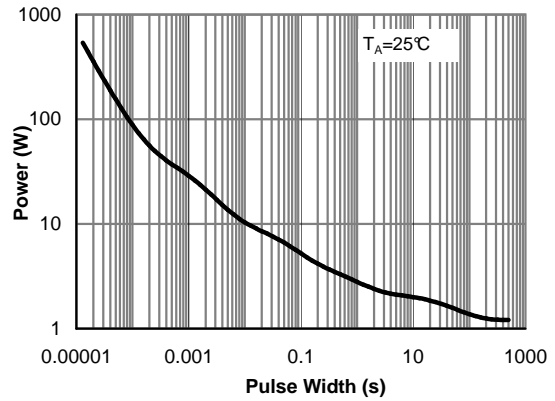


Figure 10: Single Pulse Power Rating Junction-to-Ambient

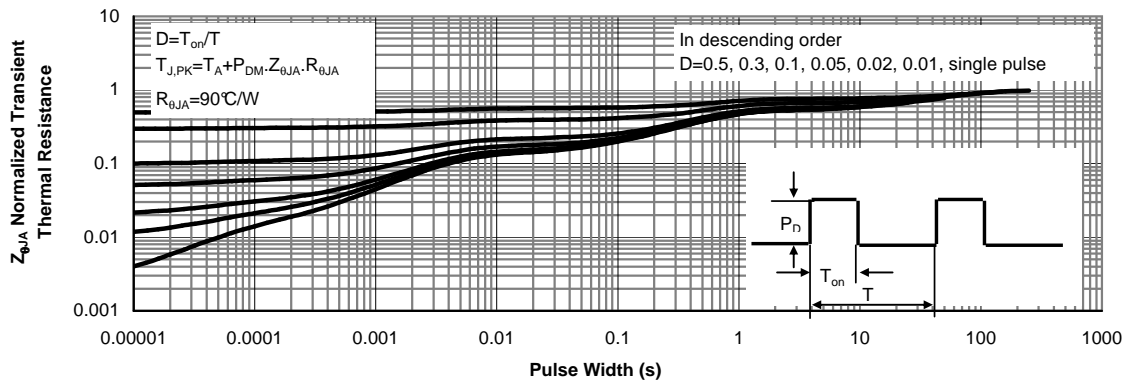
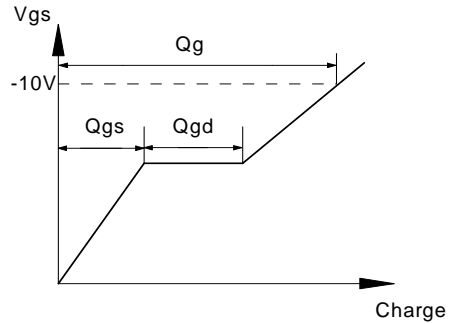
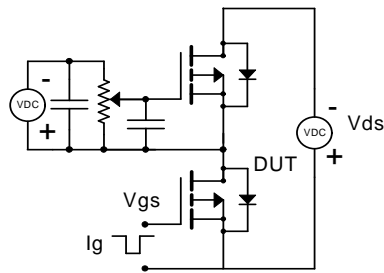


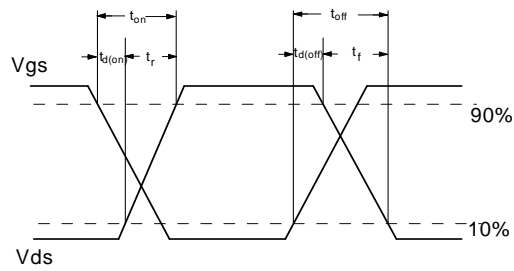
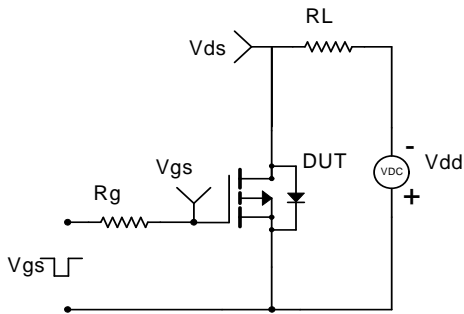
Figure 11: Normalized Maximum Transient Thermal Impedance

COMPLEMENTARY MOSFET

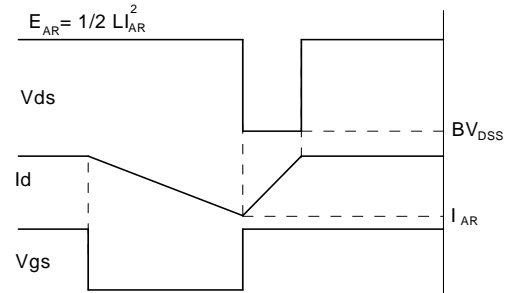
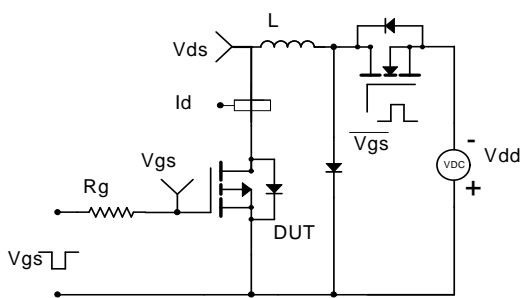
Gate Charge Test Circuit & Waveform



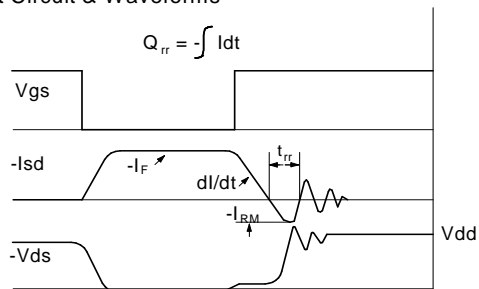
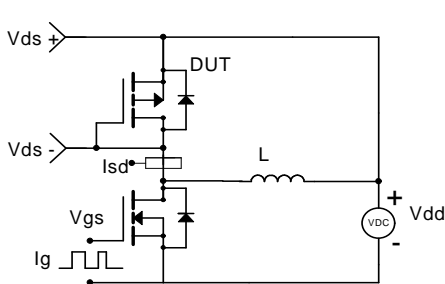
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



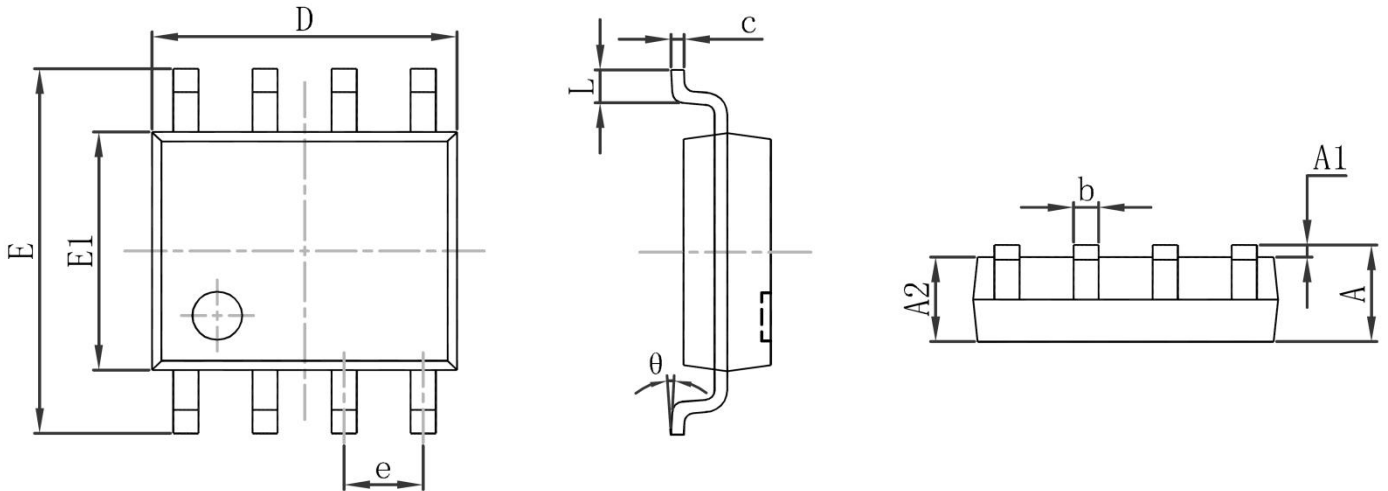
Diode Recovery Test Circuit & Waveforms





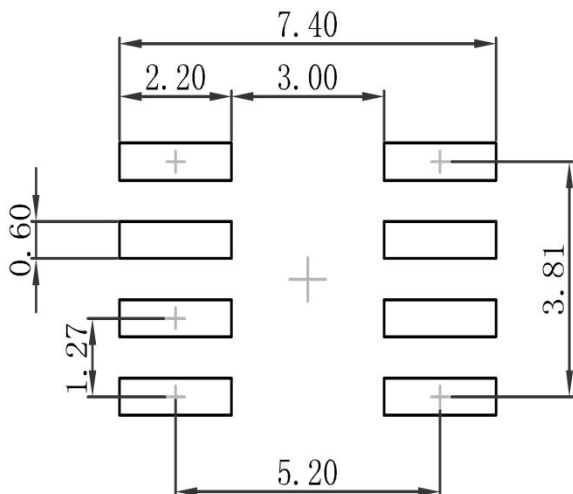
COMPLEMENTARY MOSFET

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°

SOP-8 Suggested Pad Layout



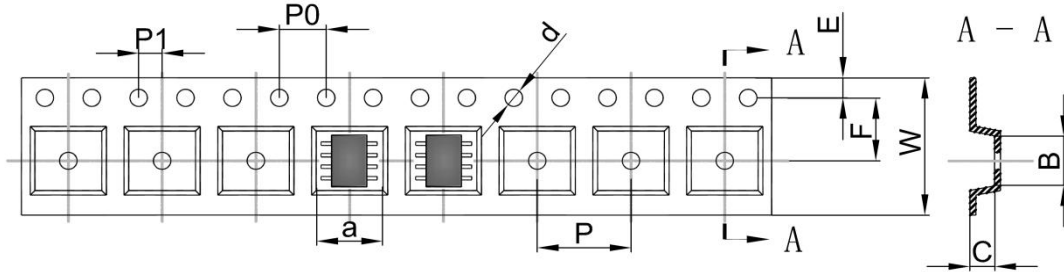
**Note:**

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

COMPLEMENTARY MOSFET

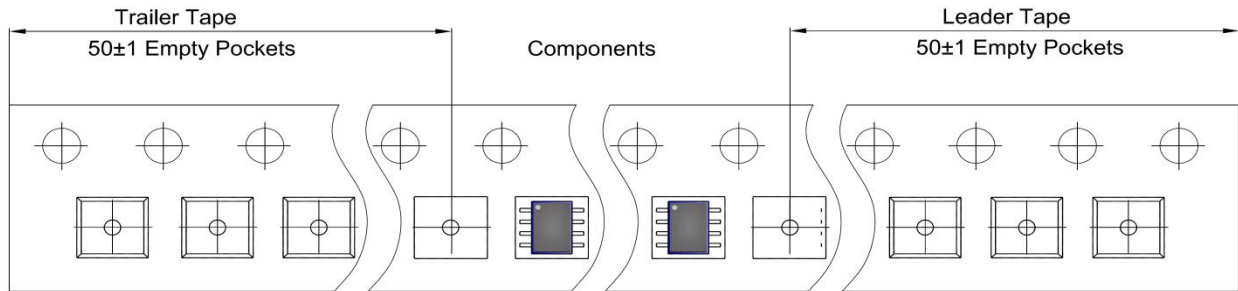
**SOP-8 Tape and Reel**

**SOP-8 Embossed Carrier Tape**

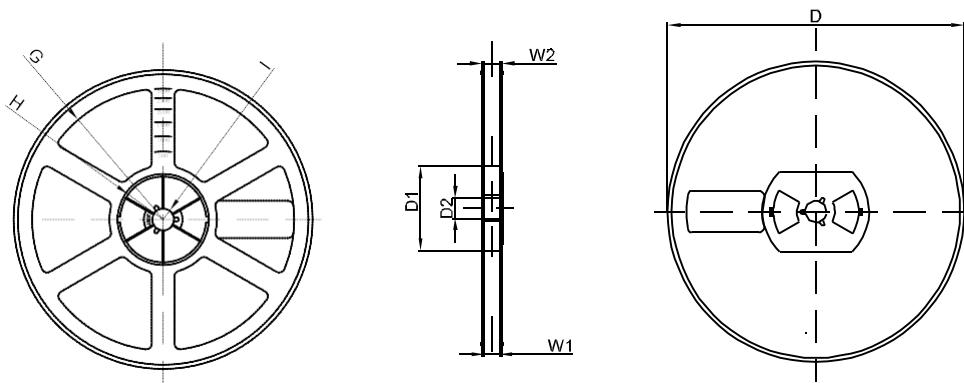


DIMENSIONS ARE IN MILLIMETER										
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOP-8	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

**SOP-8 Tape Leader and Trailer**



**SOP-8 Reel**



DIMENSIONS ARE IN MILLIMETER								
REEL OPTION	D	D1	D2	G	H	I	W1	W2
13" DIA	Ø330.00	100.00	13.00	R151.00	R56.00	R6.50	12.40	17.60
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1