KS4606HB

Complementary Advanced Power MOSFET

Features

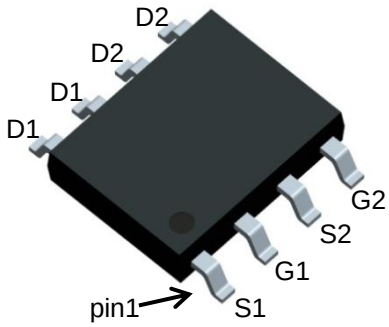
• N-Channel
30V/8A,
$R_{DS\ (ON)}$ =15mΩ(Typ.) @ V_{GS}=10V
$R_{DS\ (ON)}$ =23mΩ(Typ.) @ V_{GS}=4.5V
• P-Channel
-30V/-7A,
$R_{DS\ (ON)}$ =23mΩ (Typ.) @ V_{GS}=-10V
$R_{DS\ (ON)}$ =38mΩ (Typ.) @ V_{GS}=-4.5V
• Very low on-resistance
• Fast Switching

Applications

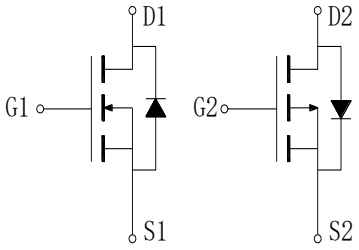
• Load Switch

RoHS Pb HF Halogen-Free

Pin Description



SOP8



Complementary MOSFET

Absolute Maximum Ratings

Symbol	Parameter		N-Channel	P-Channel	Unit
Common Ratings (T_A=25°C Unless Otherwise Noted)					
V_{DSS}	Drain-Source Voltage		30	-30	V
V_{GSS}	Gate-Source Voltage		±20	±20	
T_J	Maximum Junction Temperature		150	150	°C
T_{STG}	Storage Temperature Range		-55 to 150	-55 to 150	°C
I_S	Diode Continuous Forward Current	T_A=25°C	1.6	-1.6	A
Mounted on Large Heat Sink					
I_{DP} ①	300μs Pulse Drain Current Tested	T_A=25°C	32	-28	A
I_D ②	Continuous Drain Current(V_{GS}=±10V)	T_A=25°C	8	-7	A
		T_A=70°C	6.4	-5.6	
P_D	Maximum Power Dissipation	T_A=25°C	2	2	W
		T_A=70°C	1.3	1.3	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead		24	24	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient		62.5	62.5	°C/W
Drain-Source Avalanche Ratings					
E_{AS} ④	Avalanche Energy, Single Pulsed		14	32	mJ

Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition		KS4606HB Min.	KS4606HB Typ.	KS4606HB Max.	Unit
Static Characteristics							
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	N	30			V
		V_{GS}=0V, I_{DS}=-250μA	P	-30			
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V	N			1	μA
		T_J=125°C	N			30	
		V_{DS}=-30V, V_{GS}=0V	P			-1	
		T_J=125°C	P			-30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	N	1.1	1.6	2.3	V
		V_{DS}=V_{GS}, I_{DS}=-250μA	P	-1.1	-1.6	-2.3	
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	N			±100	nA
		V_{GS}=±20V, V_{DS}=0V	P			±100	
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=8A	N		15	20	mΩ
		V_{GS}=-10V, I_{DS}=-8A	P		23	28	
		V_{GS}=4.5V, I_{DS}=6A	N		23	28	
		V_{GS}=-4.5V, I_{DS}=-6A	P		38	45	
Diode Characteristics							
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=7A, V_{GS}=0V	N		0.85	1.2	V
		I_{SD}=-7A, V_{GS}=0V	P		-0.85	-1.2	
t_{rr}	Reverse Recovery Time	N-Channel I_{SD}=8A, dI_{SD}/dt=100A/μs	N		6.5		ns
			P		7		
Q_{rr}	Reverse Recovery Charge	P-Channel I_{SD}=-8A, dI_{SD}/dt=100A/μs	N		3.1		nC
			P		6.3		
Dynamic Characteristics ⑥							
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	N		4.8		Ω
			P		10.6		
C_{iss}	Input Capacitance	N-Channel V_{GS}=0V,V_{DS}=15V, Frequency=1.0MHz	N		460		pF
			P		860		
C_{oss}	Output Capacitance	P-Channel V_{GS}=0V,V_{DS}=-15V, Frequency=1.0MHz	N		75		
			P		140		
C_{rss}	Reverse Transfer Capacitance		N		60		
			P		95		

Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

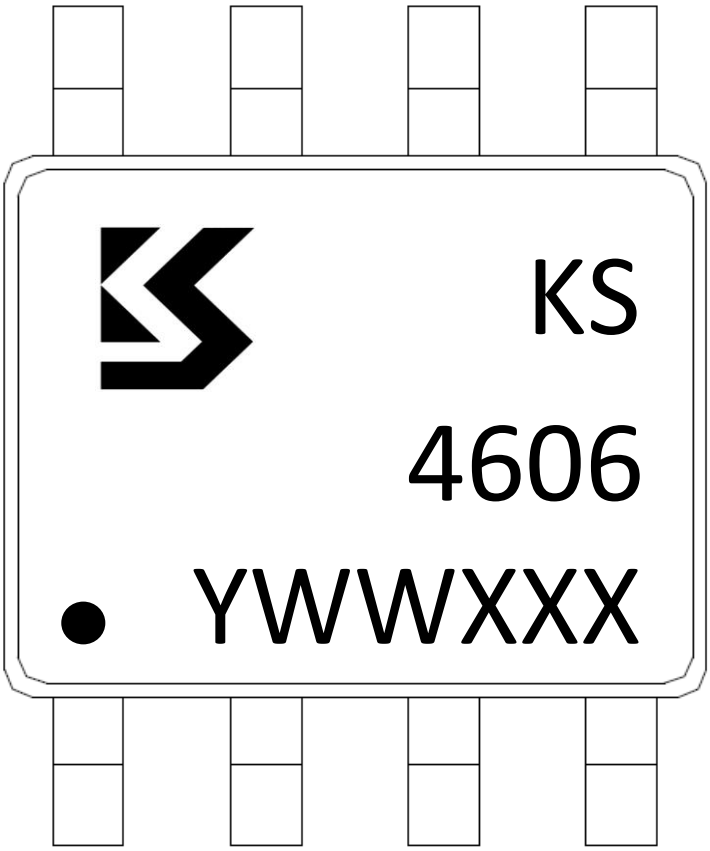
Symbol	Parameter	Test Condition		KS4606HB			Unit
				Min.	Typ.	Max.	
Dynamic Characteristics⑥							
$t_{d(ON)}$	Turn-on Delay Time	N-Channel V_{DD}=15V, I_{DS}=8A, V_{GEN}=10V, R_G=3Ω P-Channel V_{DD}=-15V, I_{DS}=-8A, V_{GEN}= -10V, R_G=3Ω	N		7		ns
			P		8		
t_r	Turn-on Rise Time		N		10		
			P		13		
$t_{d(OFF)}$	Turn-off Delay Time		N		22		
			P		25		
t_f	Turn-off Fall Time		N		7		
			P		11		
Gate Charge Characteristics⑥							
Q_g	Total Gate Charge	N-Channel V_{DS}=15V, V_{GS}=10V, I_{DS}=8A P-Channel V_{DS}=-15V, V_{GS}= -10V, I_{DS}=-8A	N		11.3		nC
			P		19		
Q_{gs}	Gate-Source Charge		N		3		
			P		4.3		
Q_{gd}	Gate-Drain Charge		N		4.3		
			P		6.5		

Notes:

①Pulse width limited by safe operating area.
②Calculated continuous current based on maximum allowable junction temperature.
③When mounted on 1 inch square copper board, t≤10sec. The value in any given application depends on the user's specific board design.
④Limited by $T_{Jmax.}$ Starting T_J = 25°C, N Chanel: L = 0.5mH,R_G = 25Ω, I_{AS} = 6A, V_{GS} =10V, P-Chanel: L = 0.5mH, R_G = 25Ω, I_{AS} = -9A, V_{GS} =-10V, Part not recommended for use above this value.
⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.
⑥Guaranteed by design, not subject to production testing.

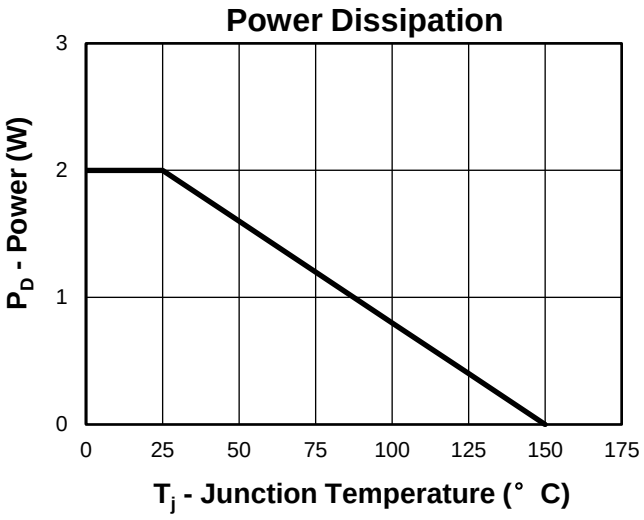
Ordering and Marking Information

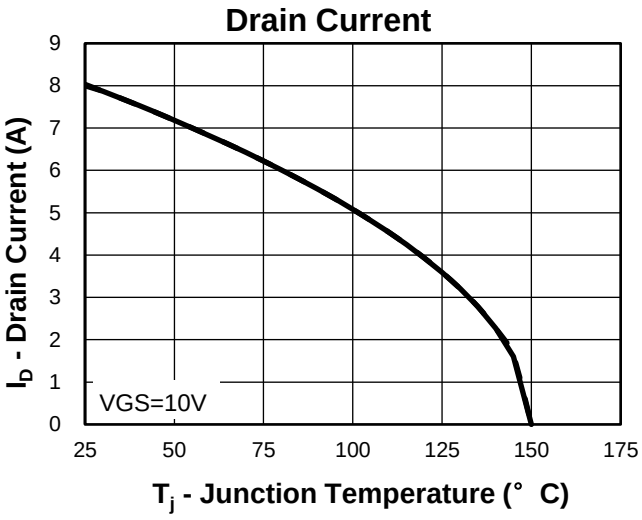
Device	Package	Packaging	Quantity	Reel Size	Tape width
KS4606HB	SOP8	Tape&Reel	3000	13''	12mm

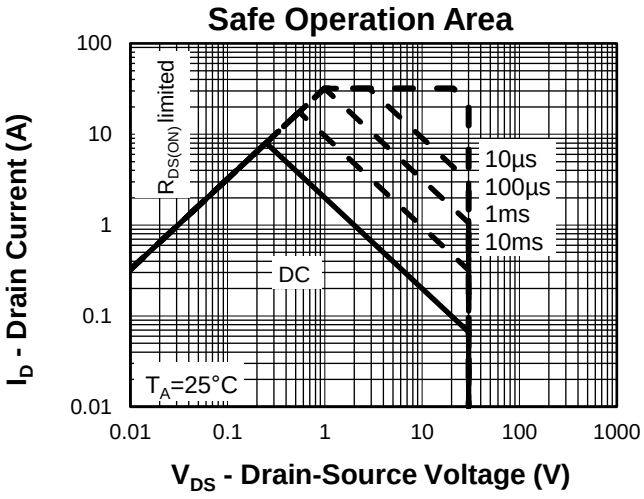


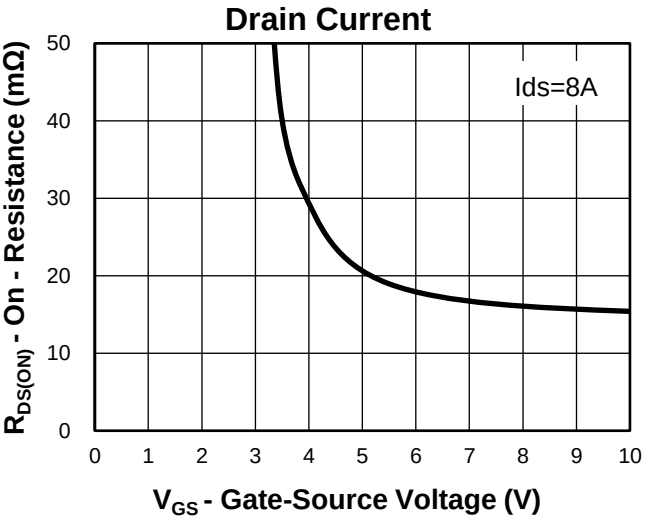
Y =Year,2017-A,2018-B,etc.
WW =Week.
XXX =Lot number.

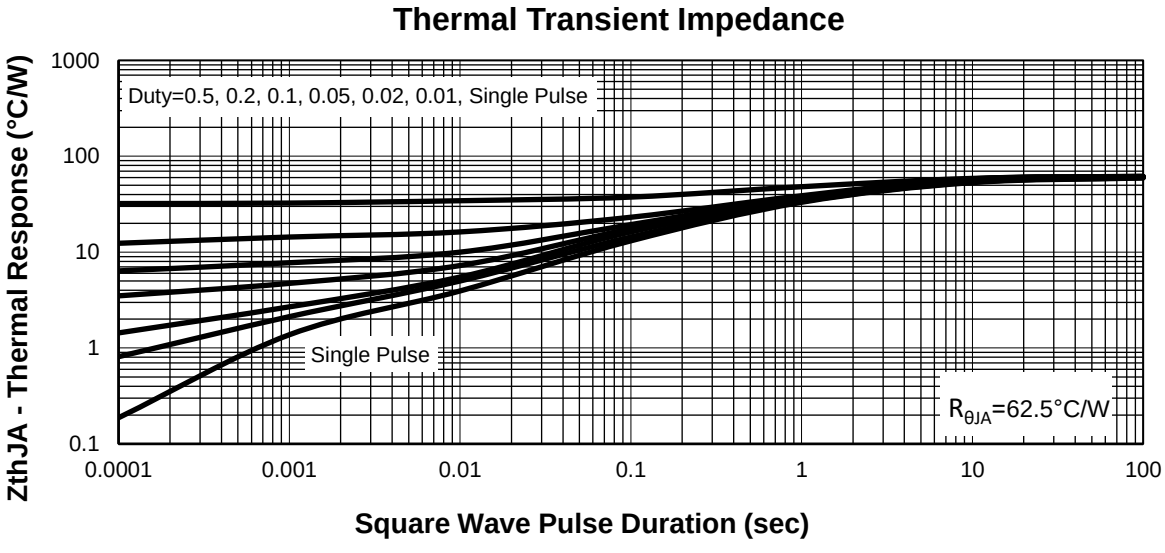
Typical Characteristics(N-Channel)



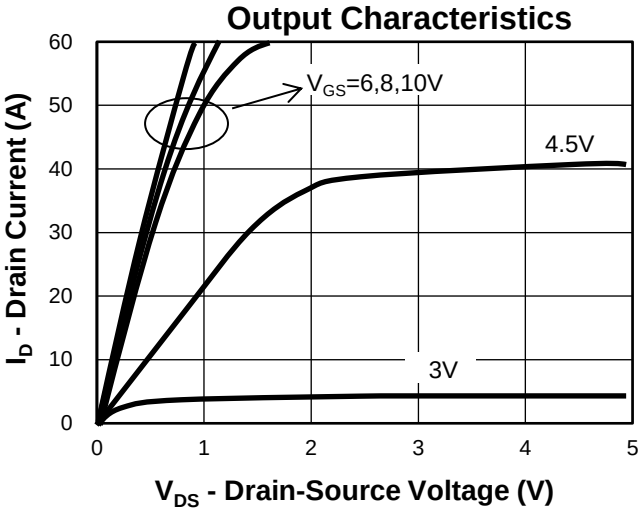


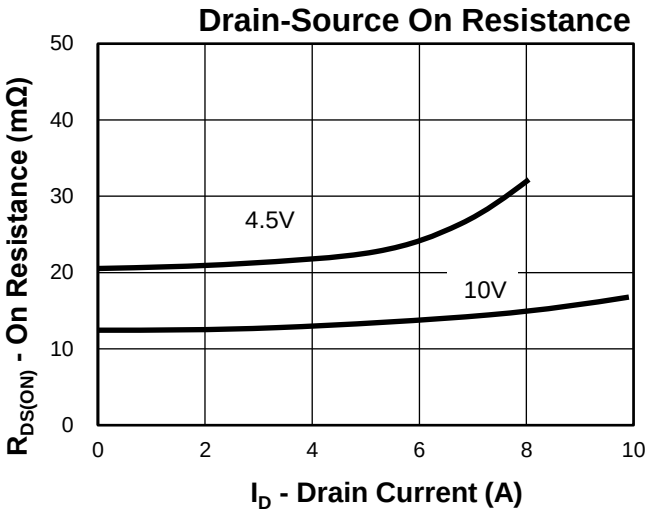


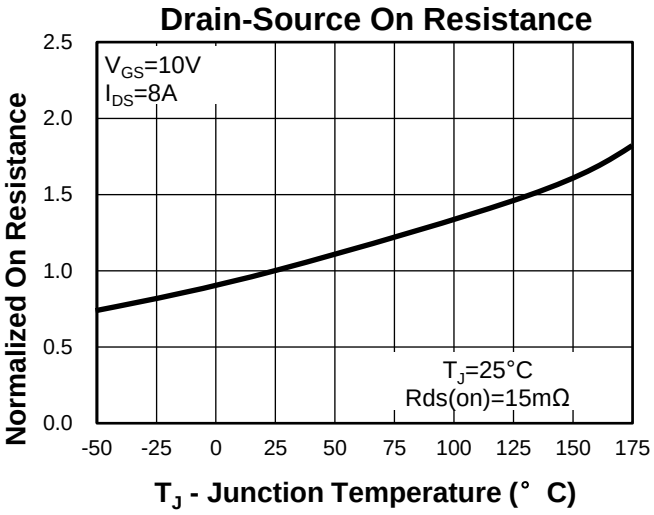


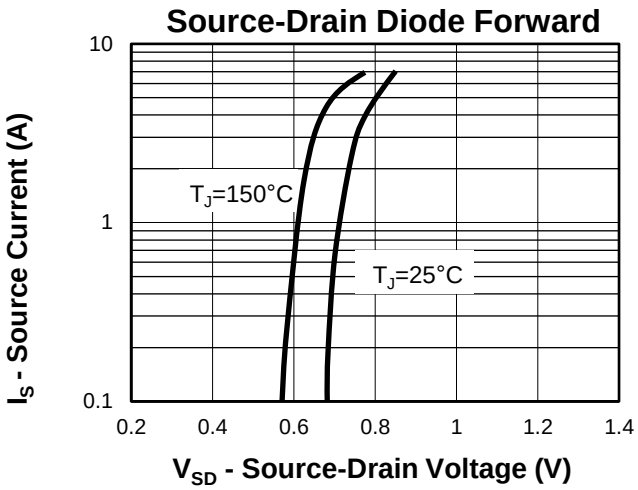


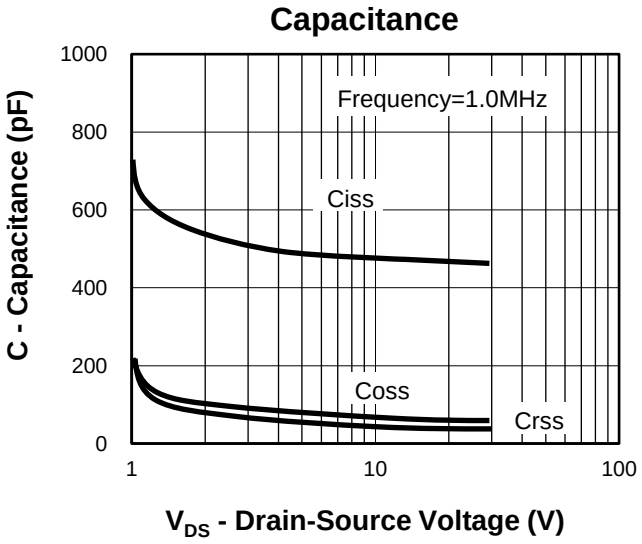
Typical Characteristics(N-Channel)

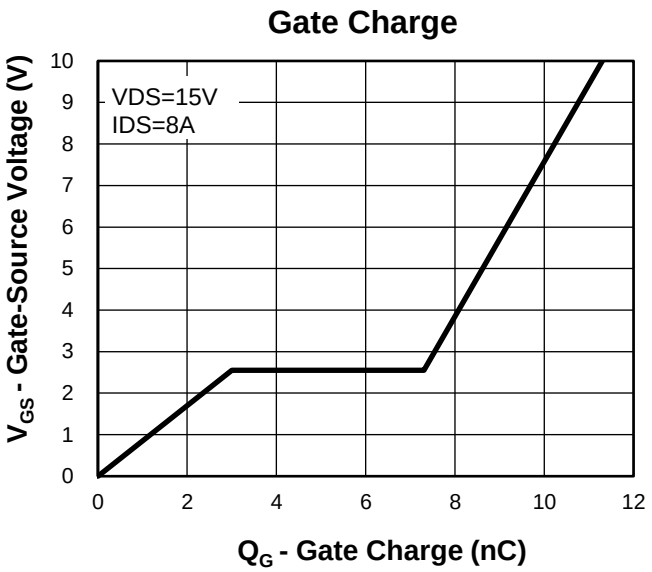




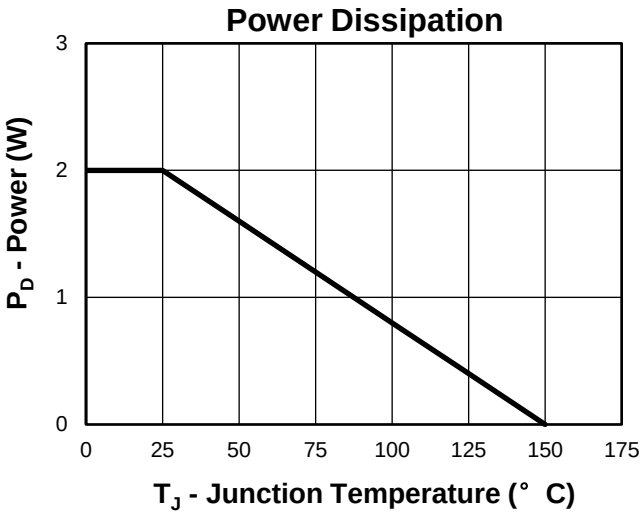


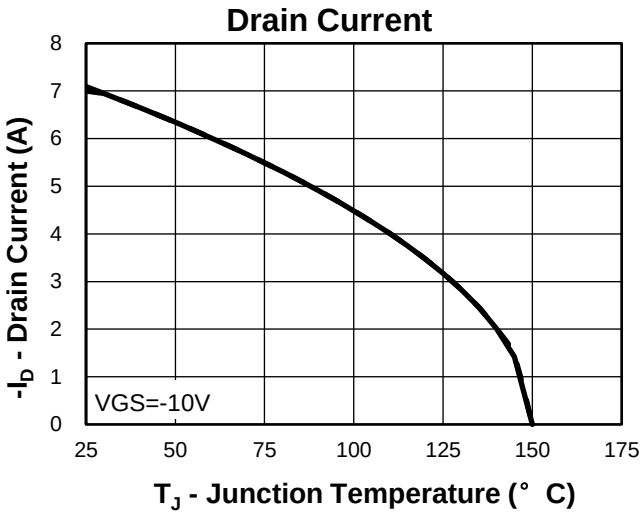


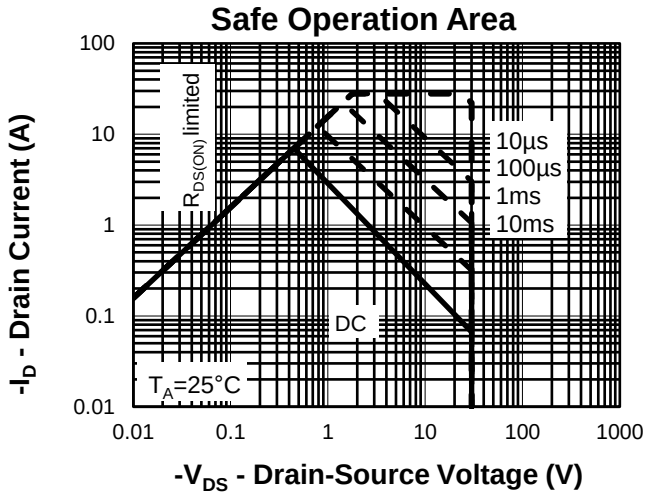


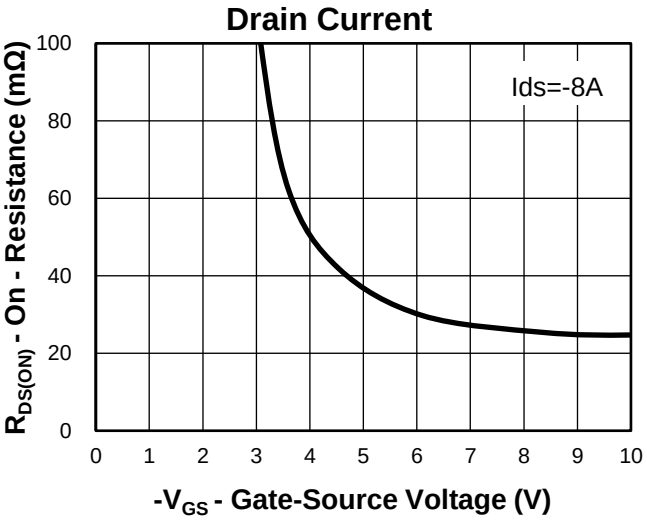


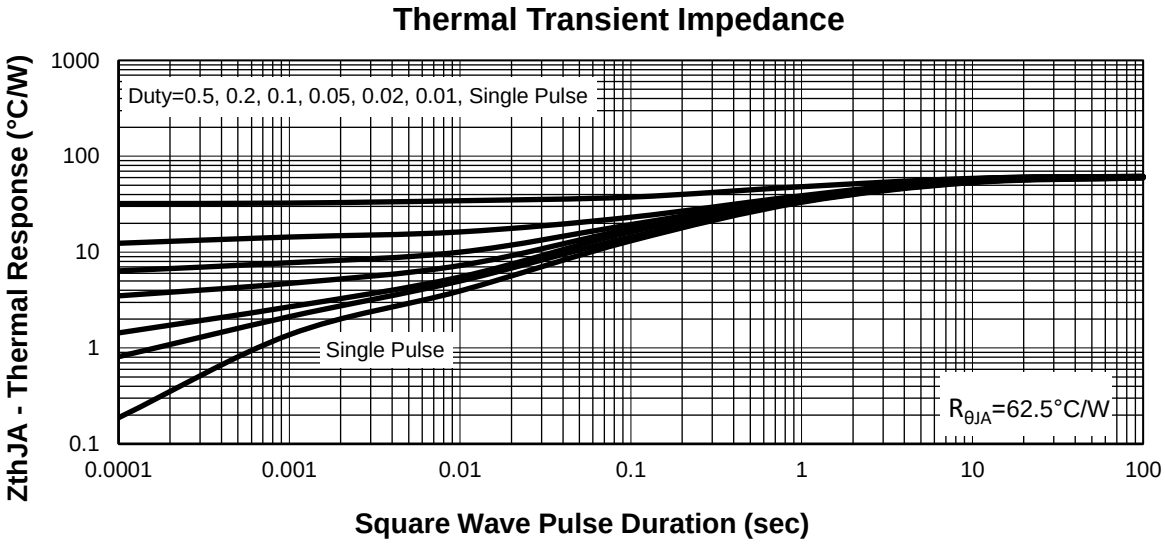
Typical Characteristics(P-Channel)



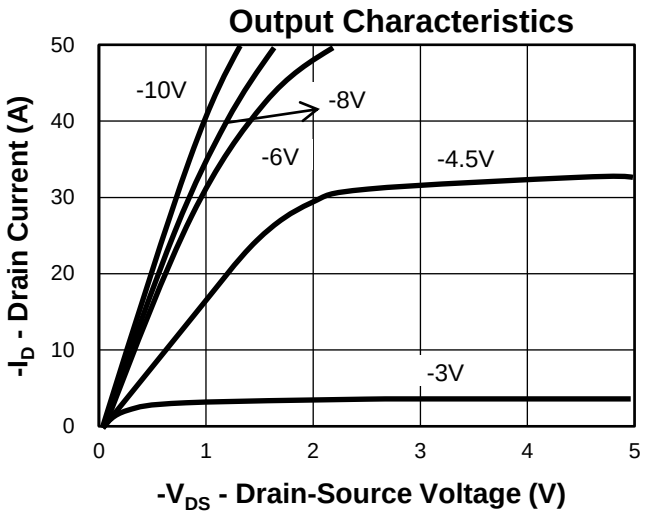


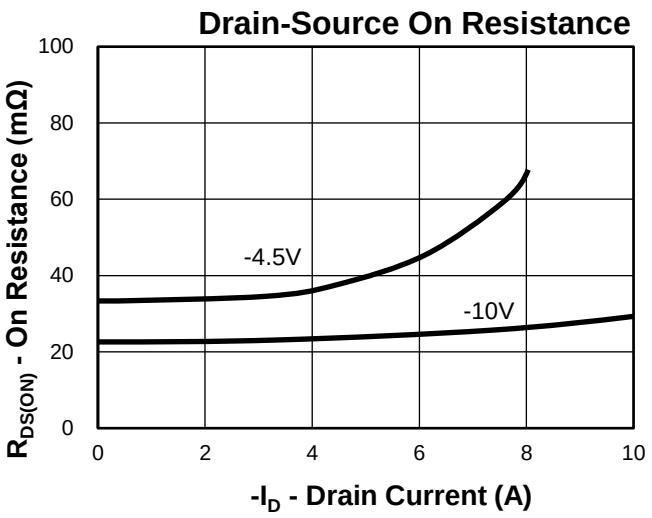


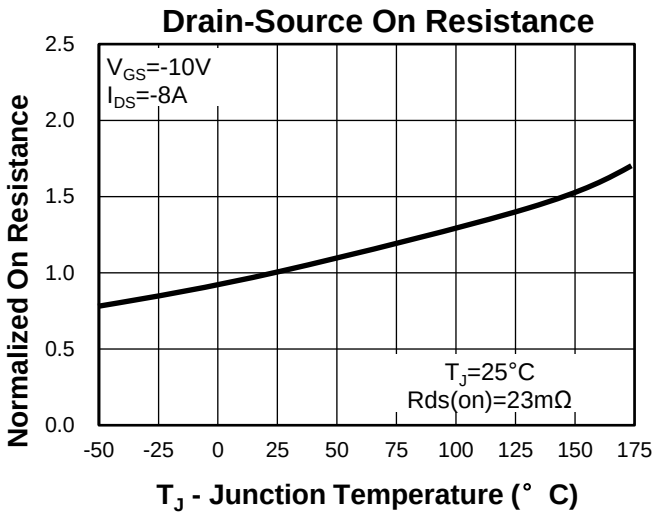


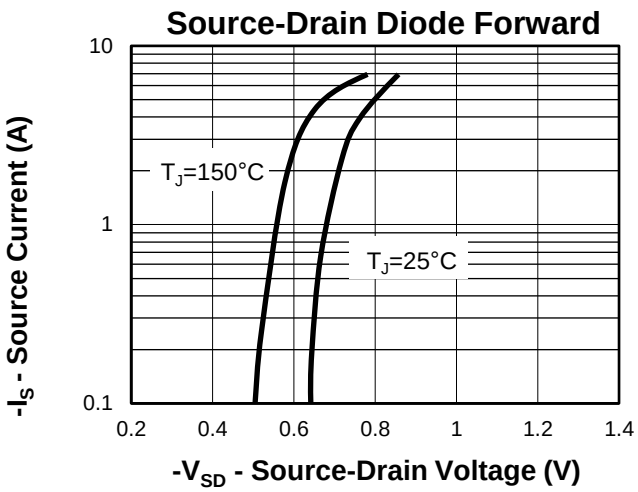


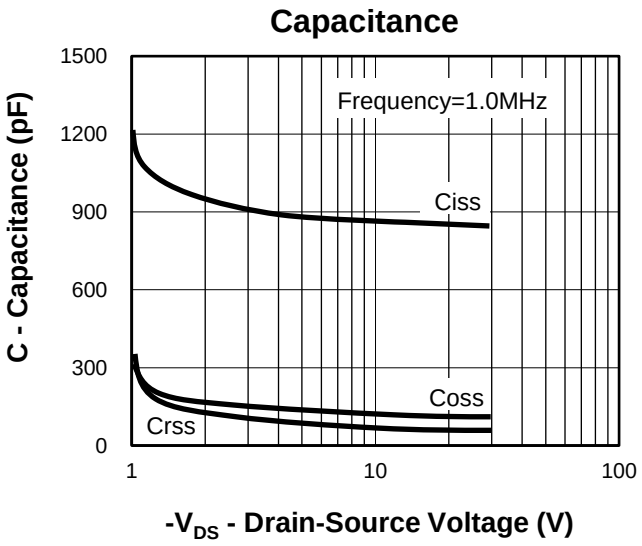
Typical Characteristics(P-Channel)

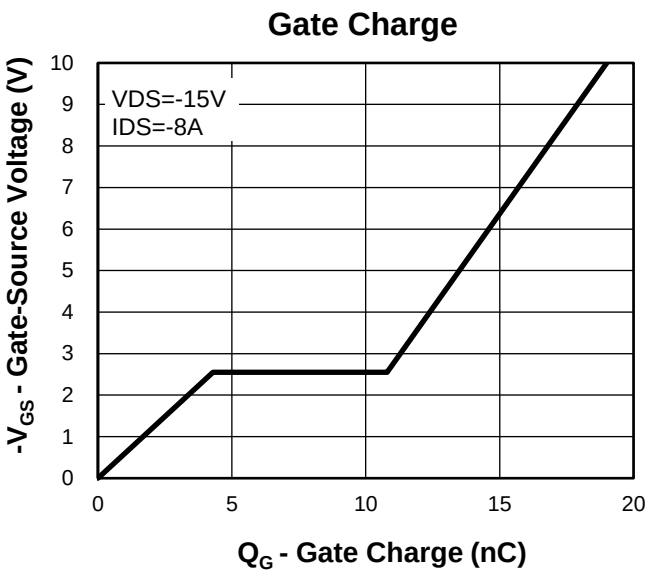






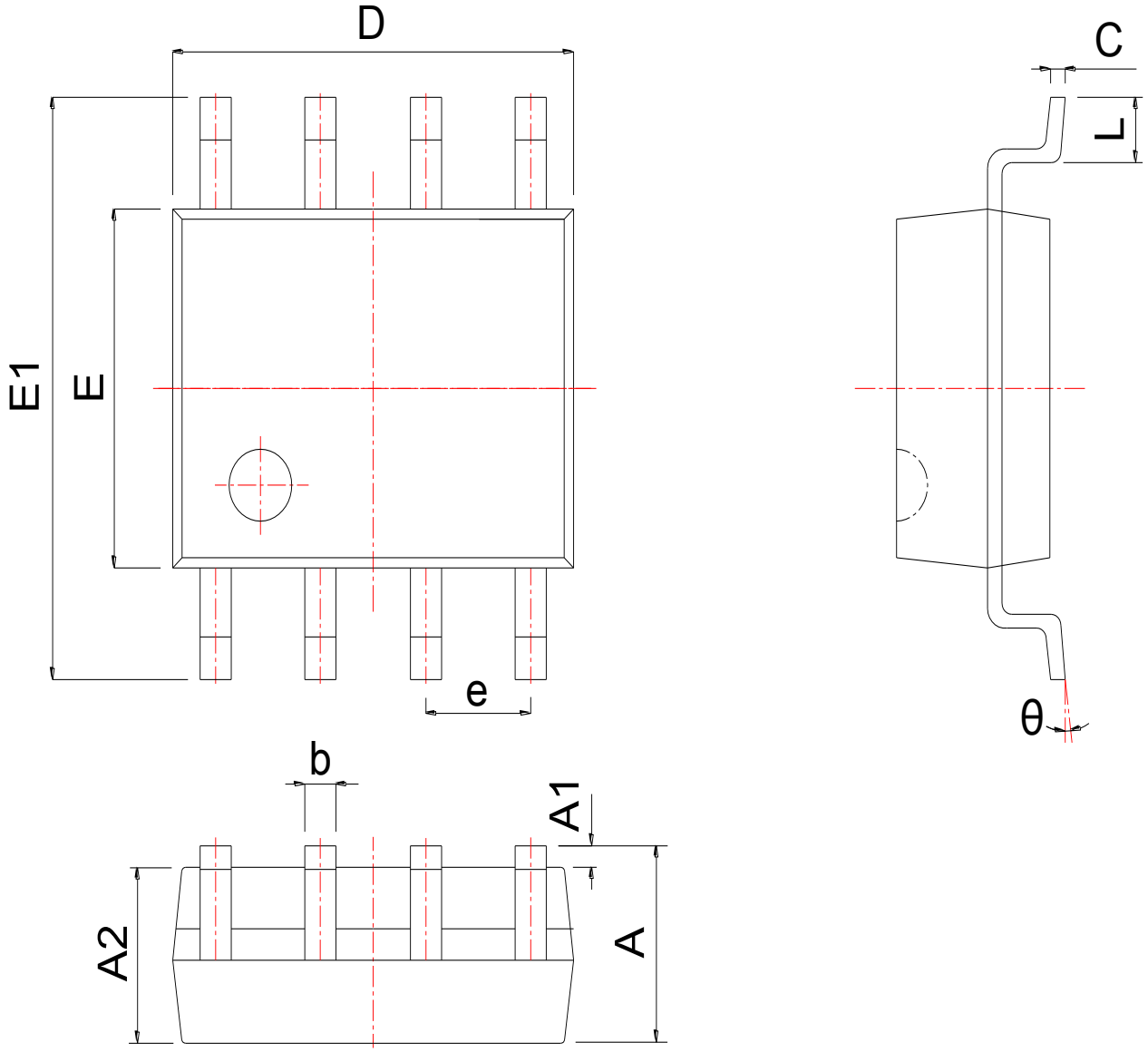






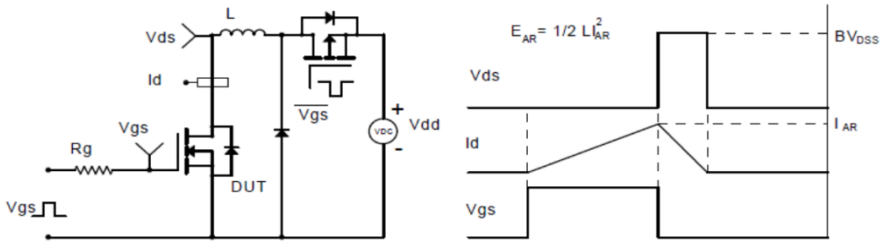
Package Information

SOP8

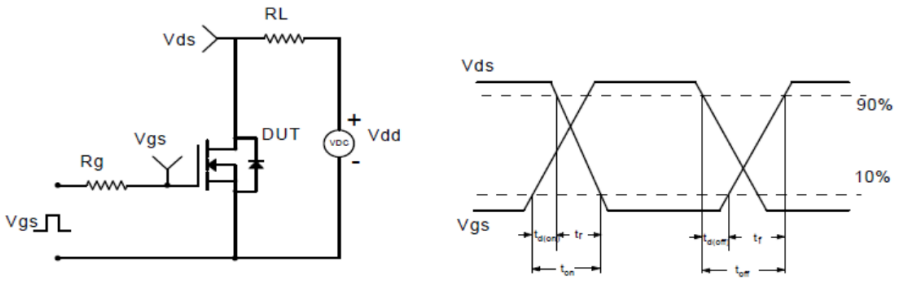


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.300	1.525	1.750	0.051	0.060	0.069
A1	0.050	0.150	0.250	0.002	0.006	0.010
A2	1.350	1.450	1.550	0.053	0.057	0.061
b	0.330	0.420	0.510	0.013	0.017	0.020
c	0.170	0.210	0.250	0.007	0.008	0.010
D	4.700	4.900	5.100	0.185	0.193	0.201
E	3.800	3.900	4.000	0.150	0.154	0.157
E1	5.800	6.000	6.200	0.228	0.236	0.244
e	1.270 BSC			0.050 BSC		
L	0.400	0.835	1.270	0.016	0.033	0.050
θ	0°		8°	0°		8°

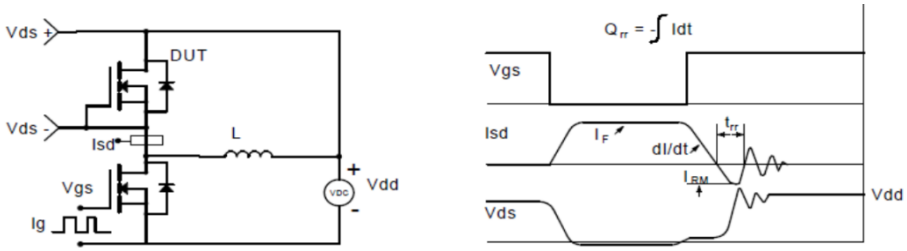
Avalanche Test Circuit and Waveforms(N-Channel)



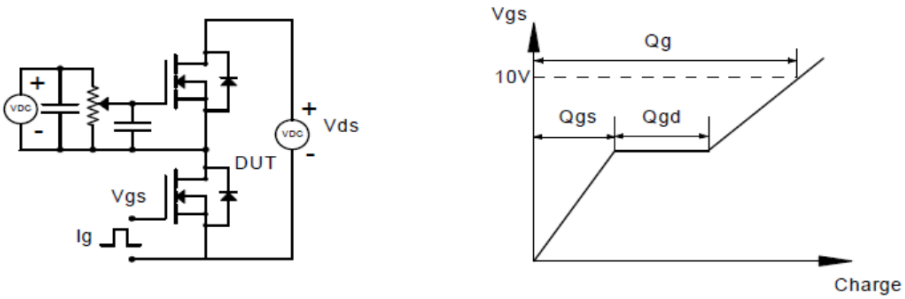
Switching Time Test Circuit and Waveforms(N-Channel)



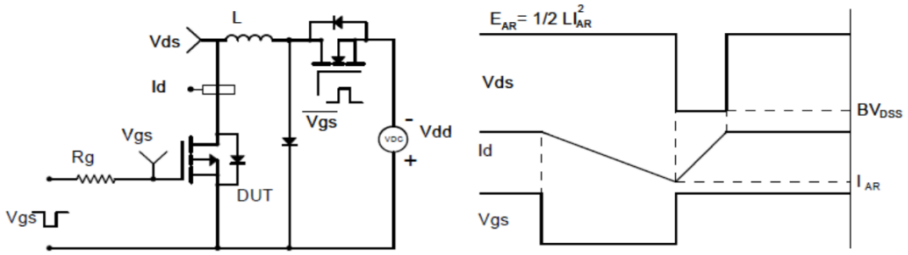
Diode Recovery Test Circuit and Waveforms(N-Channel)



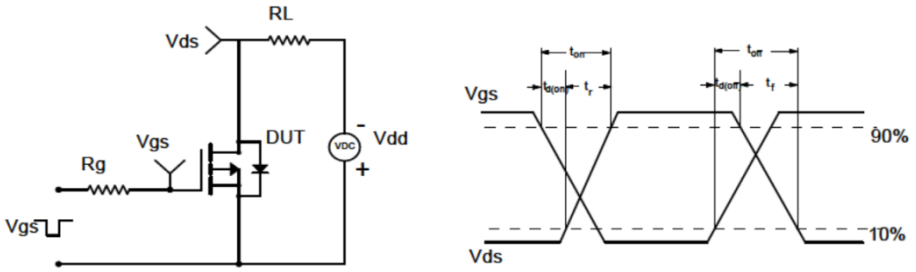
Gate Charge Test Circuit and Waveform(N-Channel)



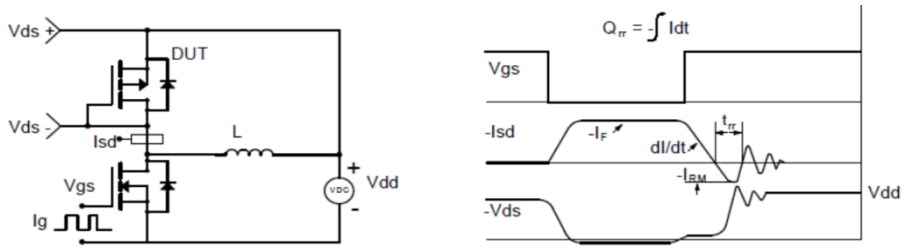
Avalanche Test Circuit and Waveforms(P-Channel)



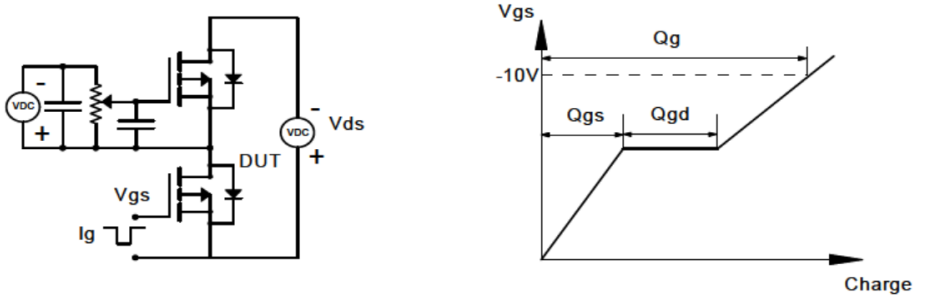
Switching Time Test Circuit and Waveforms(P-Channel)



Diode Recovery Test Circuit and Waveforms(P-Channel)



Gate Charge Test Circuit and Waveform(P-Channel)



Customer Service

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