

Features

- N-Channel
60V/20A
 $R_{DS(ON)} = 25m\Omega$ (Typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 30m\Omega$ (Typ.) @ $V_{GS} = 4.5V$
- P-Channel
-60V/-15A
 $R_{DS(ON)} = 51m\Omega$ (Typ.) @ $V_{GS} = -10V$
 $R_{DS(ON)} = 65m\Omega$ (Typ.) @ $V_{GS} = -4.5V$
- Very low on-resistance
- Fast Switching

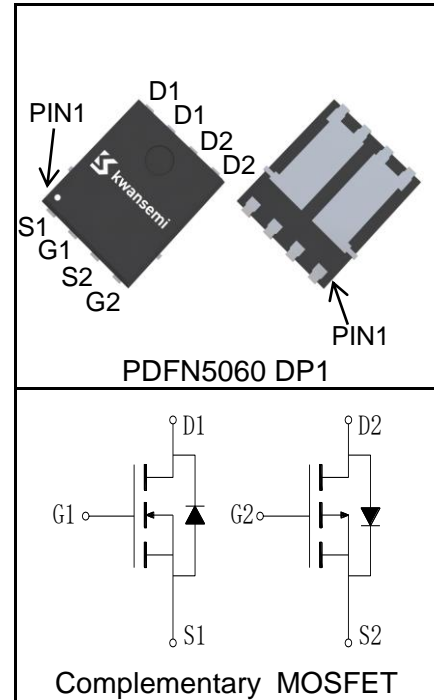
Applications

- Motor Drive Applications



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		N-Channel	P-Channel	Unit
Common Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)					
V_{DSS}	Drain-Source Voltage		60	-60	V
V_{GSS}	Gate-Source Voltage		± 20	± 20	
T_J	Maximum Junction Temperature		150	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	-55 to 150	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C = 25^\circ\text{C}$	20	-15	A
Mounted on Large Heat Sink					
$I_{DP}^{(1)}$	Pulse Drain Current	$T_C = 25^\circ\text{C}$	80	-60	A
$I_D^{(2)}$	Continuous Drain Current @ T_C ($V_{GS} = \pm 10V$)	$T_C = 25^\circ\text{C}$	20	-15	A
		$T_C = 100^\circ\text{C}$	12	-9	
	Continuous Drain Current @ T_A ($V_{GS} = \pm 10V$) ⁽³⁾	$T_A = 25^\circ\text{C}$	7	-5	
		$T_A = 70^\circ\text{C}$	5	-4	
P_D	Maximum Power Dissipation @ T_C	$T_C = 25^\circ\text{C}$	24	26	W
		$T_C = 100^\circ\text{C}$	9	10	
	Maximum Power Dissipation @ T_A ⁽³⁾	$T_A = 25^\circ\text{C}$	3.1	3.1	
		$T_A = 70^\circ\text{C}$	2	2	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		5.2	4.8	$^\circ\text{C}/\text{W}$
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient		40	40	$^\circ\text{C}/\text{W}$
Drain-Source Avalanche Ratings					
$E_{AS}^{(4)}$	Avalanche Energy, Single Pulsed		56	56	mJ

Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS6618NA			Unit	
			Min.	Typ.	Max.		
Static Characteristics							
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	N	60		V	
		$V_{GS}=0V, I_{DS}=-250\mu A$	P	-60			
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	N		1	μA	
		$T_J=125^\circ\text{C}$			30		
		$V_{DS}=-60V, V_{GS}=0V$	P		-1		
		$T_J=125^\circ\text{C}$			-30		
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	N	1.1	1.6	2.1	V
		$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	P	-1.1	-1.6	-2.1	
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	N			± 100	nA
		$V_{GS}=\pm 20V, V_{DS}=0V$	P			± 100	
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=8A$	N		25	30	m Ω
		$V_{GS}=-10V, I_{DS}=-8A$	P		51	62	
		$V_{GS}=4.5V, I_{DS}=5A$	N		30	40	
		$V_{GS}=-4.5V, I_{DS}=-5A$	P		65	85	
Diode Characteristics							
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=8A, V_{GS}=0V$	N		0.85	1.2	V
		$I_{SD}=-8A, V_{GS}=0V$	P		-0.88	-1.2	
t_{rr}	Reverse Recovery Time	N-Channel $I_{SD}=8A, di_{SD}/dt=100A/\mu s$	N		9		ns
			P		7		
Q_{rr}	Reverse Recovery Charge	P-Channel $I_{SD}=-8A, di_{SD}/dt=100A/\mu s$	N		17		nC
			P		13		
Dynamic Characteristics⁽⁶⁾							
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	N		2.3		Ω
			P		18		
C_{iss}	Input Capacitance	N-Channel $V_{GS}=0V, V_{DS}=30V,$ Frequency=1.0MHz	N		1350		pF
			P		1125		
C_{oss}	Output Capacitance	P-Channel $V_{GS}=0V, V_{DS}=-30V,$ Frequency=1.0MHz	N		60		
			P		65		
C_{rss}	Reverse Transfer Capacitance	N-Channel $V_{GS}=0V, V_{DS}=-30V,$ Frequency=1.0MHz	N		55		
			P		50		

Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS6618NA			Unit	
			Min.	Typ.	Max.		
Dynamic Characteristics ^⑥							
$t_{d(ON)}$	Turn-on Delay Time	N-Channel $V_{DD}=30\text{V}$, $I_{DS}=8\text{A}$, $V_{GEN}=10\text{V}$, $R_G=3\Omega$ P-Channel $V_{DD}=-30\text{V}$, $I_{DS}=-8\text{A}$, $V_{GEN}= -10\text{V}$, $R_G=3\Omega$	N		8		ns
			P		11		
t_r	Turn-on Rise Time		N		10		
			P		18		
$t_{d(OFF)}$	Turn-off Delay Time		N		19		
			P		29		
t_f	Turn-off Fall Time		N		7		
			P		13		
Gate Charge Characteristics ^⑥							
Q_g	Total Gate Charge	N-Channel $V_{DS}=30\text{V}$, $V_{GS}=10\text{V}$, $I_{DS}=8\text{A}$ P-Channel $V_{DS}=-30\text{V}$, $V_{GS}= -10\text{V}$, $I_{DS}=-8\text{A}$	N		28		nC
			P		27		
Q_{gs}	Gate-Source Charge		N		3.9		
			P		4.2		
Q_{gd}	Gate-Drain Charge		N		6		
			P		5.5		

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature.
 - ③ When mounted on 1 inch square copper board, $t \leq 10\text{sec}$. The value in any given application depends on the user's specific board design.
 - ④ Limited by T_{Jmax} . Starting $T_J = 25^\circ\text{C}$, N Channel: $I_{ASmax} = 15\text{A}$, $L=0.5\text{mH}$, $V_{DD} = 30\text{V}$, $R_G = 25\Omega$, $V_{GS}=10\text{V}$, Part not recommended for use above this value. 100% Final Test at $I_{AS}=8\text{A}$, $L=0.5\text{mH}$. P-Channel: $I_{ASmax} = -15\text{A}$, $L=0.5\text{mH}$, $V_{DD} = -30\text{V}$, $R_G = 25\Omega$, $V_{GS}=-10\text{V}$, Part not recommended for use above this value. 100% Final Test at $I_{AS}=-8\text{A}$, $L=0.5\text{mH}$.
 - ⑤ Pulse test; Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
 - ⑥ Guaranteed by design, not subject to production testing.

Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS6618NA	PDFN5060	Tape&Reel	5000	13"	12mm

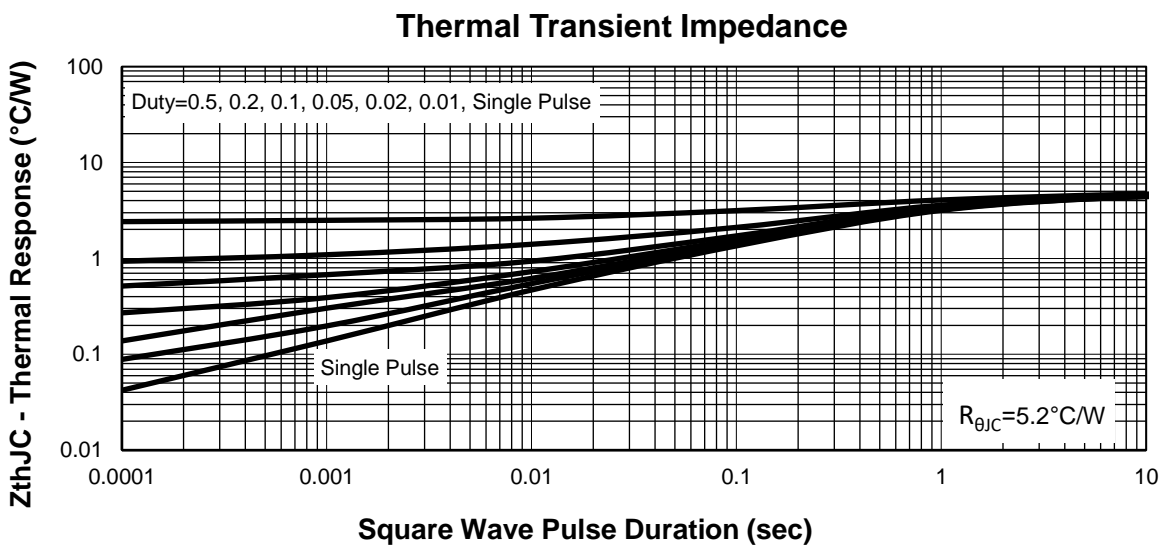
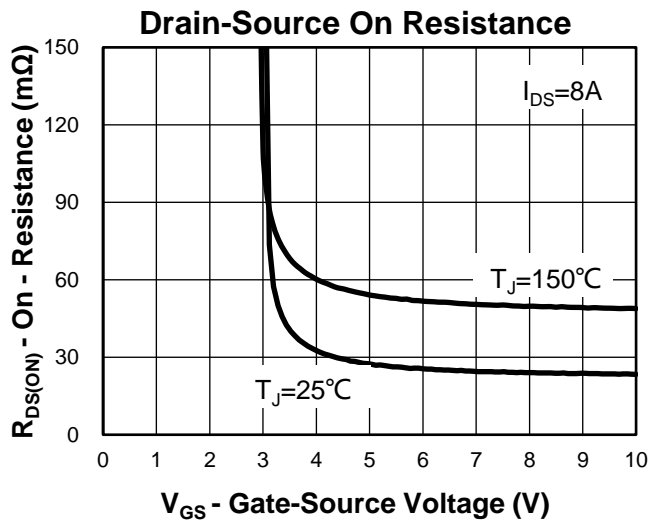
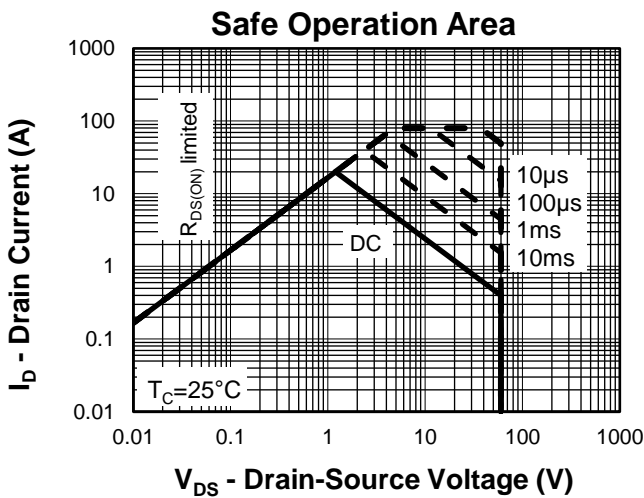
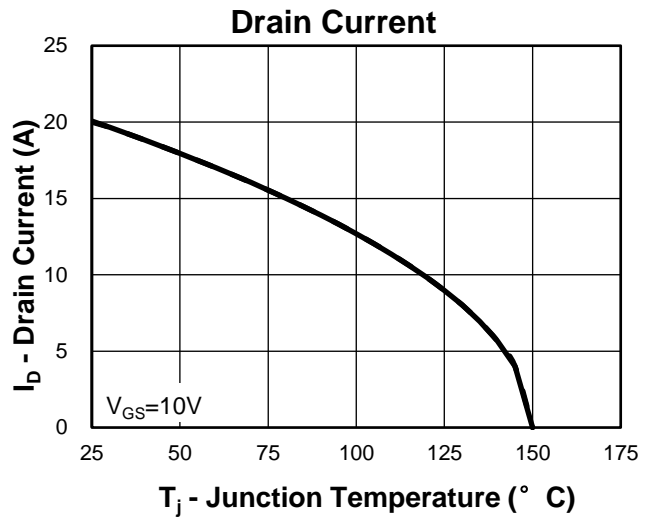
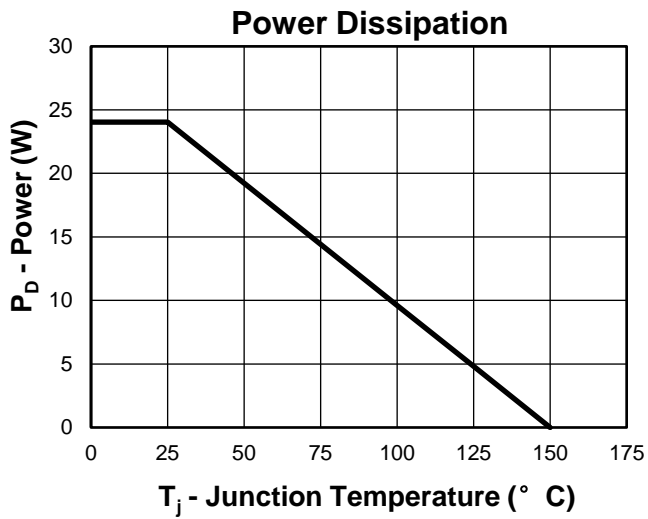


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

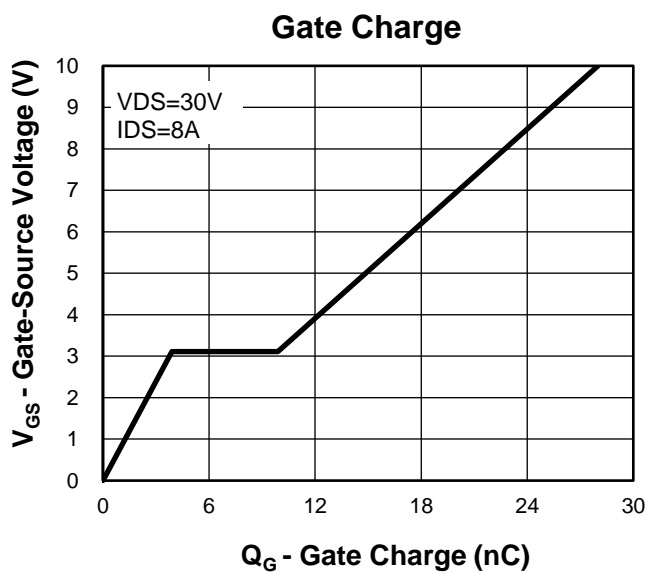
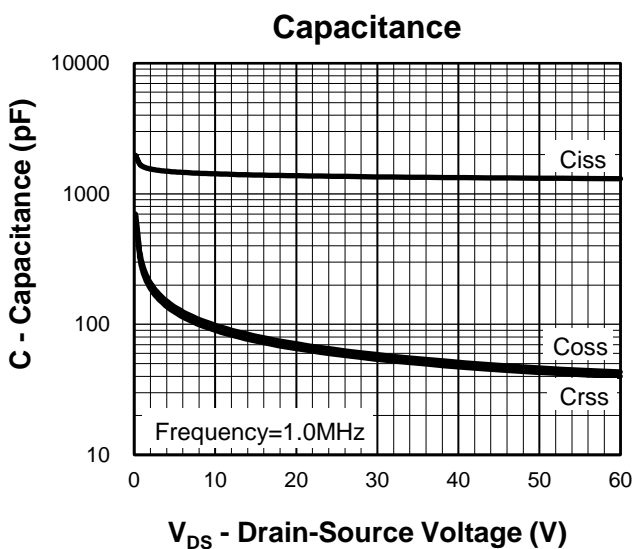
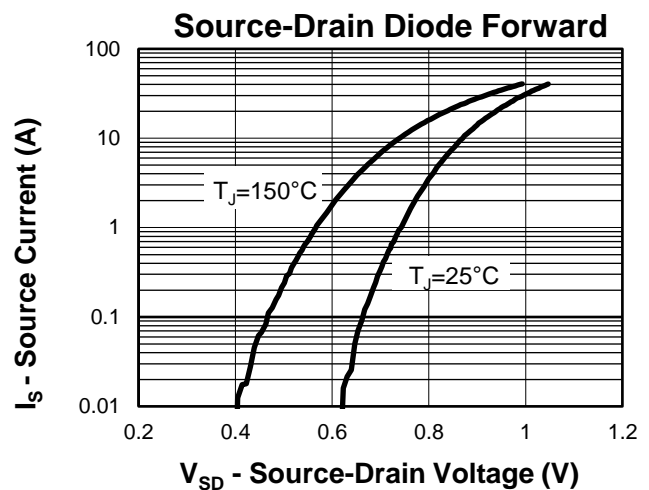
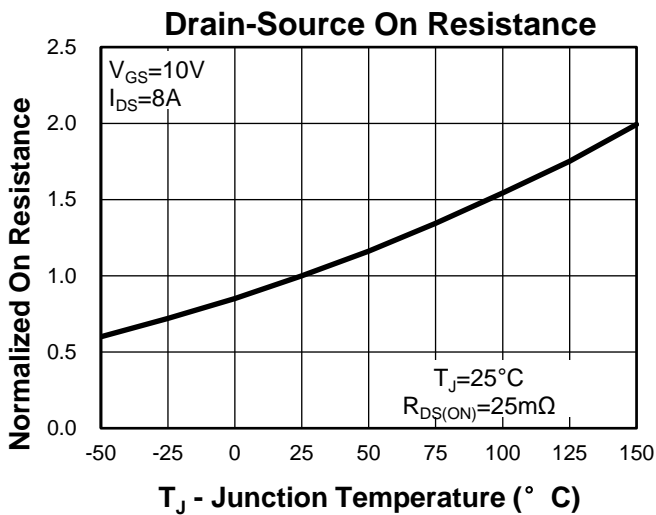
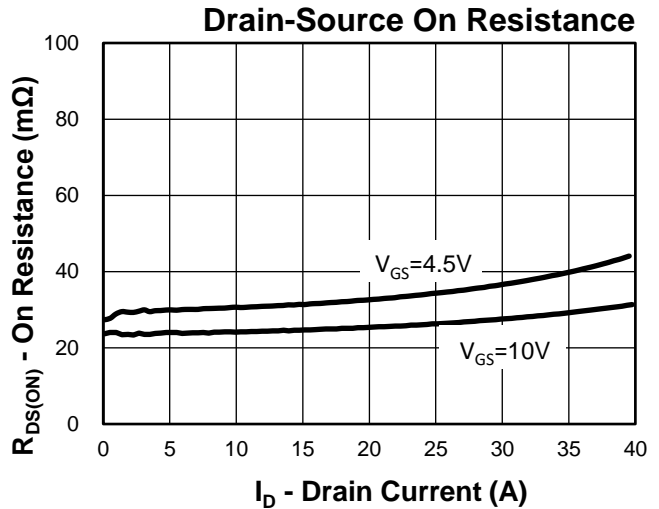
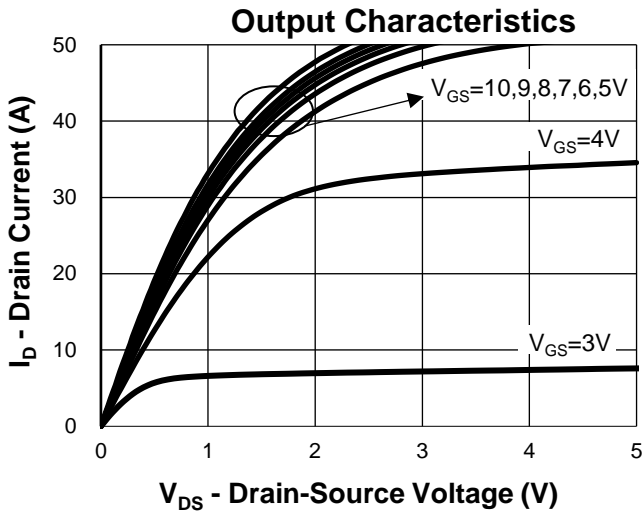
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3rd Line: Lot Number(YWWXXX)

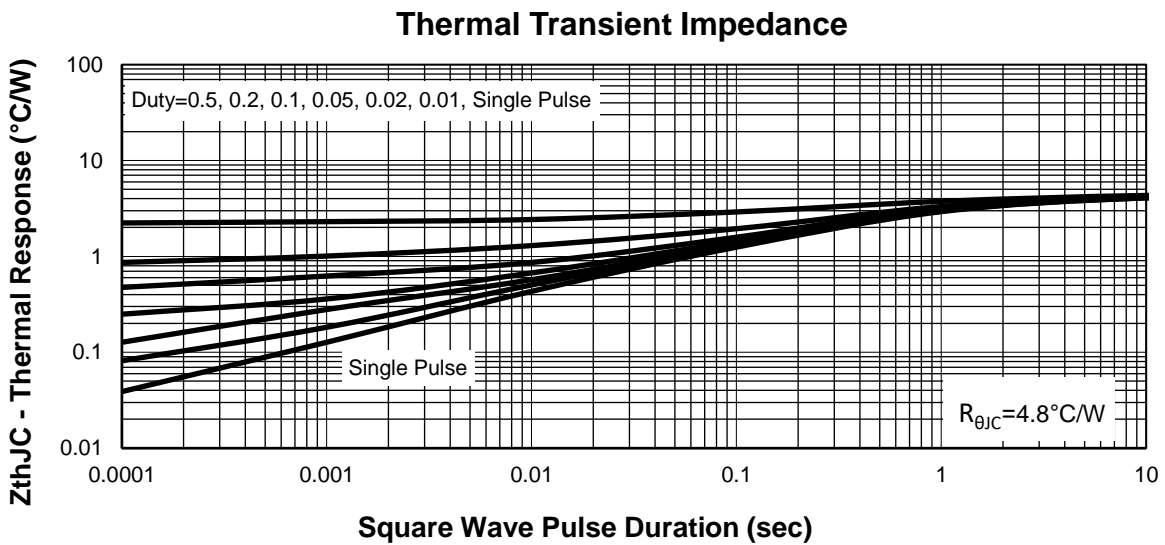
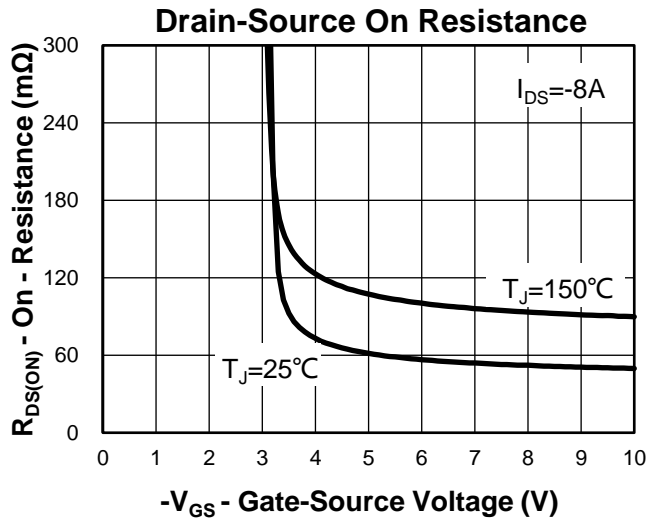
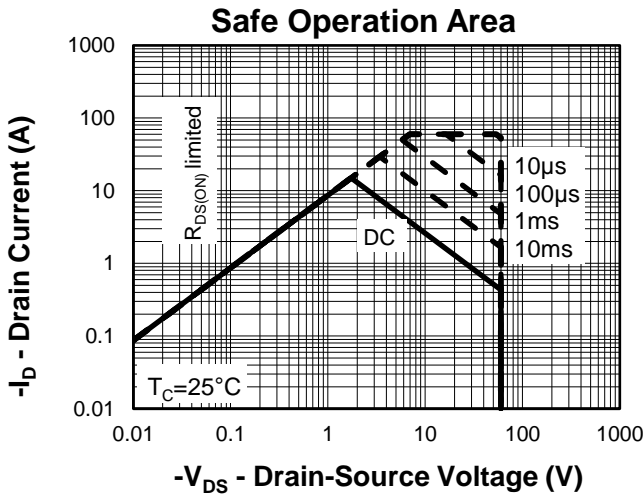
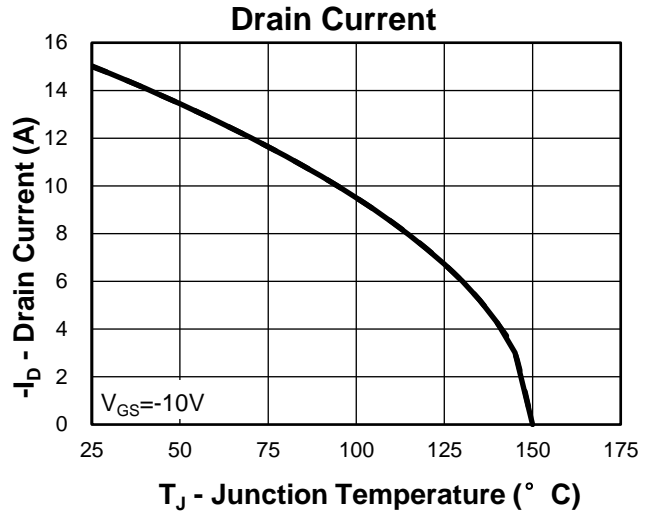
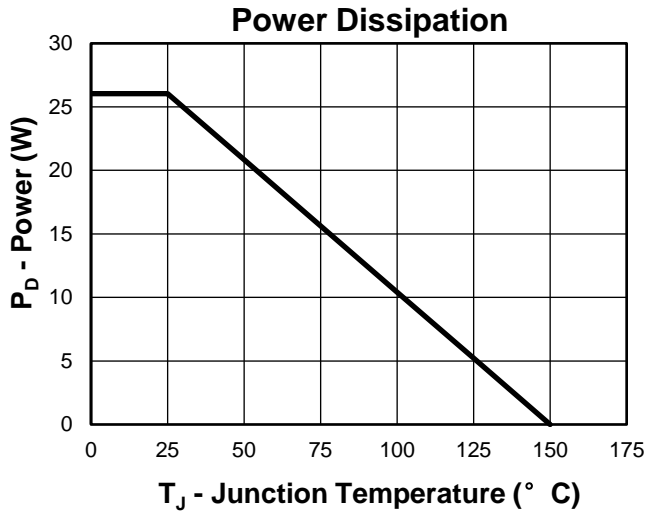
Typical Characteristics(N-Channel)



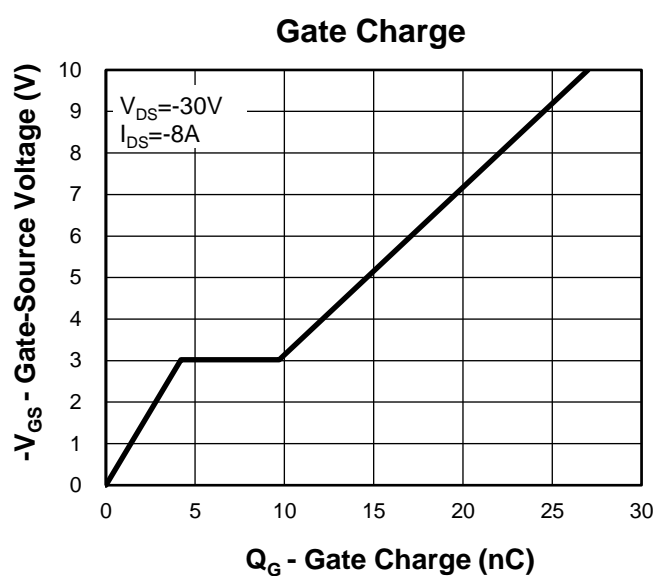
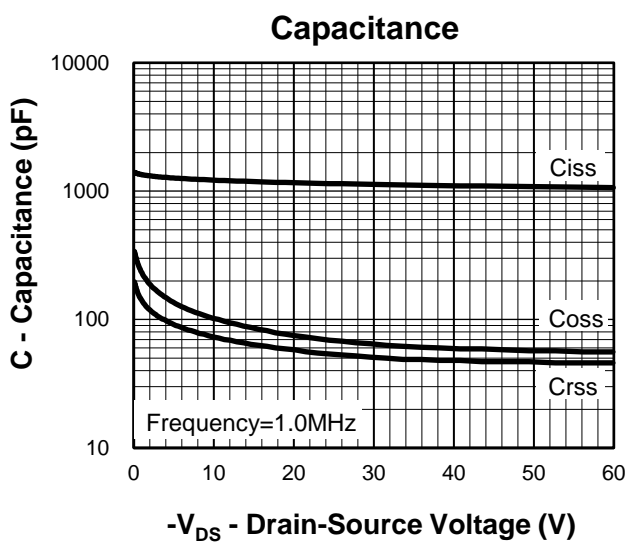
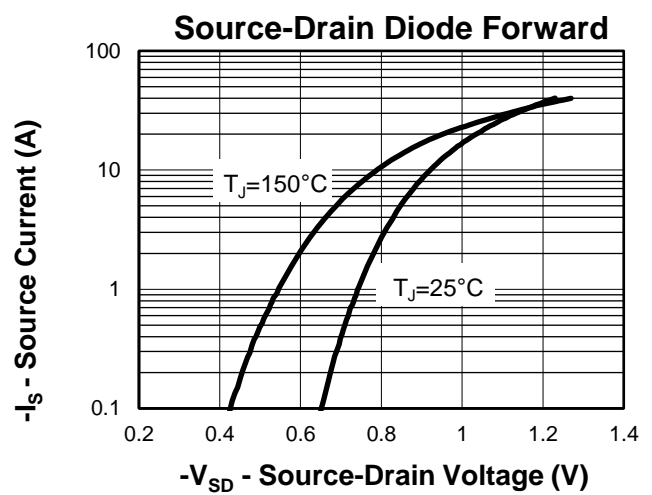
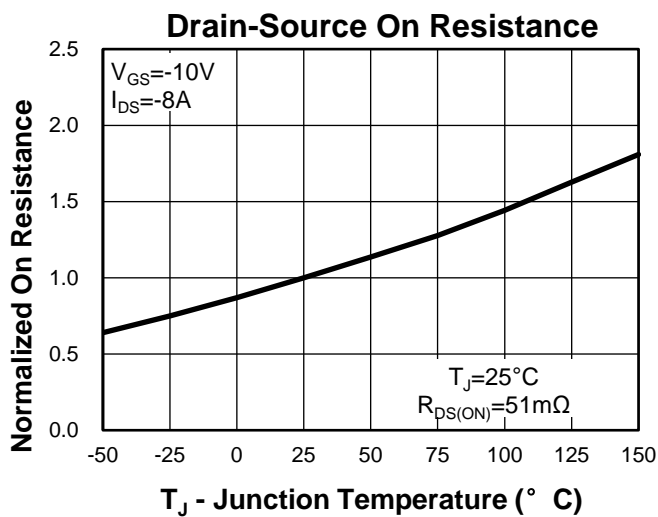
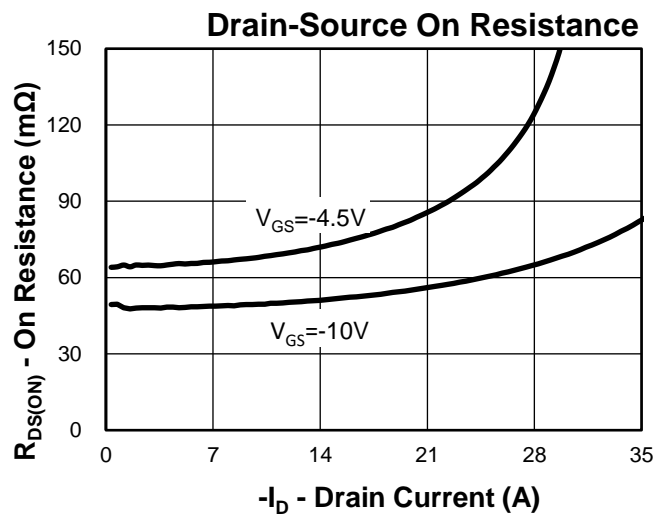
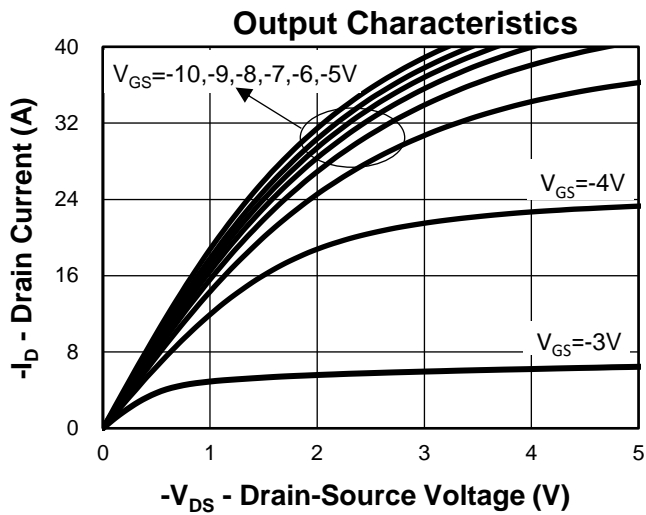
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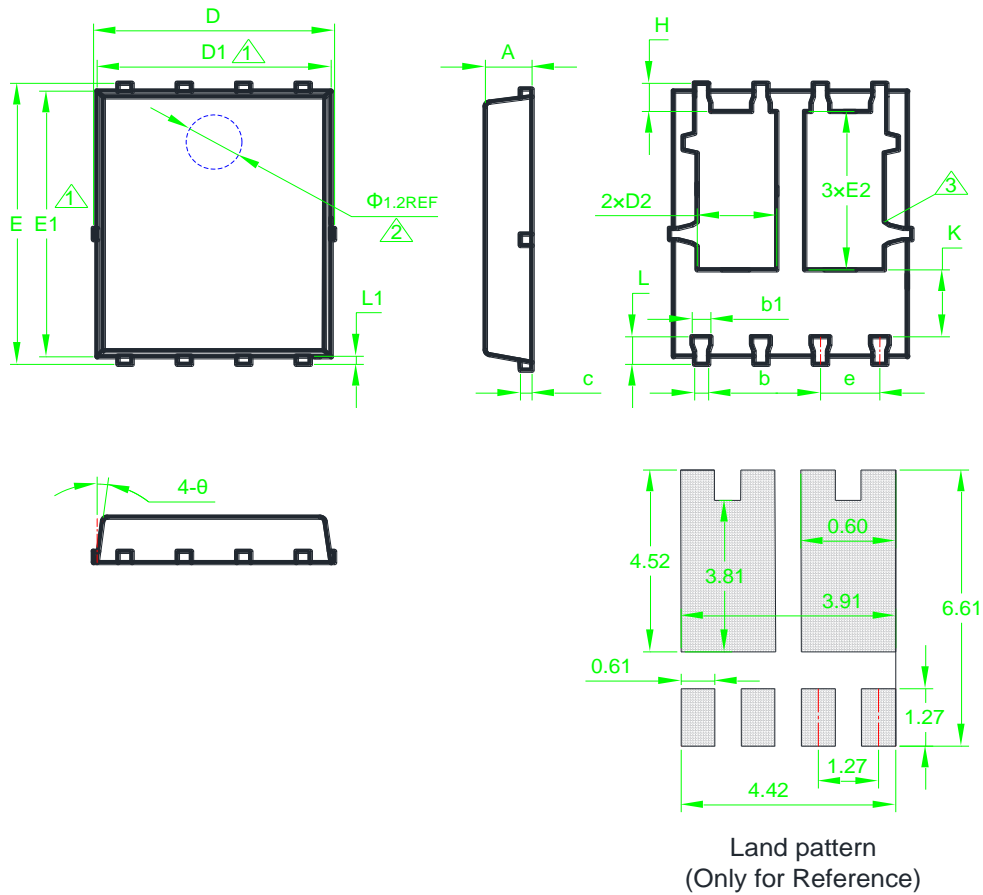


Typical Characteristics(P-Channel)



Typical Characteristics(P-Channel)



Package Information
PDFN5060 DP1


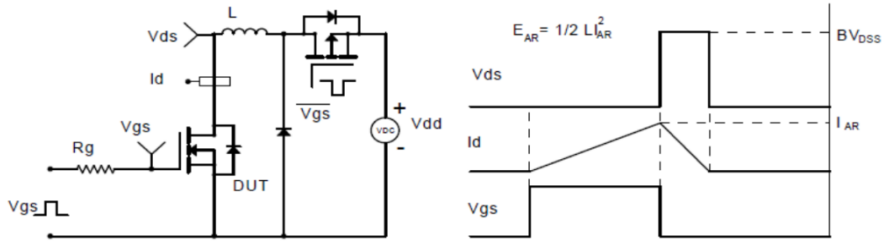
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.20	0.035	0.039	0.047	E1	5.45	*	5.95	0.215	*	0.234
A1	0.00	*	0.05	0.000	*	0.002	E2	3.35	3.50	3.80	0.132	0.138	0.150
b	0.25	*	0.50	0.010	*	0.020	e	1.27BSC			0.050BSC		
c	0.20	0.25	0.30	0.008	0.010	0.012	H	0.41	0.51	0.71	0.016	0.020	0.028
D	5.15BSC			0.203BSC			K	1.10	*	1.50	0.043	*	0.059
D1	4.80	*	5.30	0.189	*	0.209	L	0.51	0.61	0.71	0.020	0.024	0.028
D2	1.50	1.70	1.90	0.059	0.067	0.075	L1	0.06	0.13	0.20	0.002	0.005	0.008
E	5.90	6.05	6.25	0.232	0.238	0.246	θ	0°	*	12°	0°	*	12°

① Dimensions D1 and E1 do not include mold flash protrusions or gate burrs.

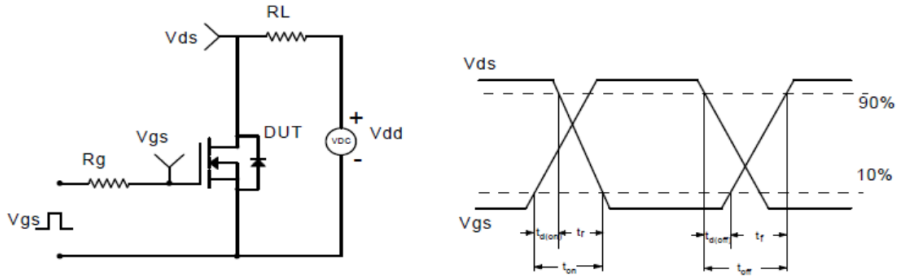
② The existence and size of demolding hole are variable depending on mold.

③ The size and shape of exposed pad are variable depending on mold.

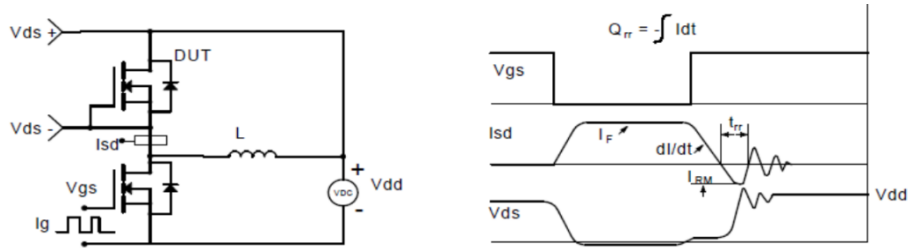
Avalanche Test Circuit and Waveforms(N-Channel)



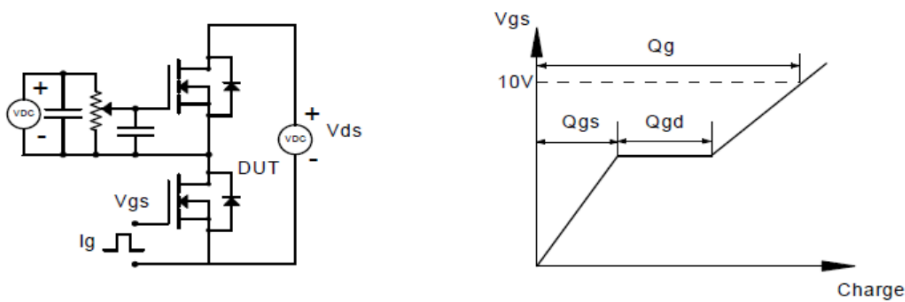
Switching Time Test Circuit and Waveforms(N-Channel)

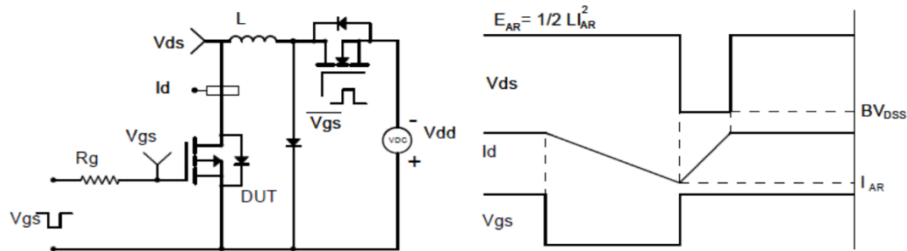
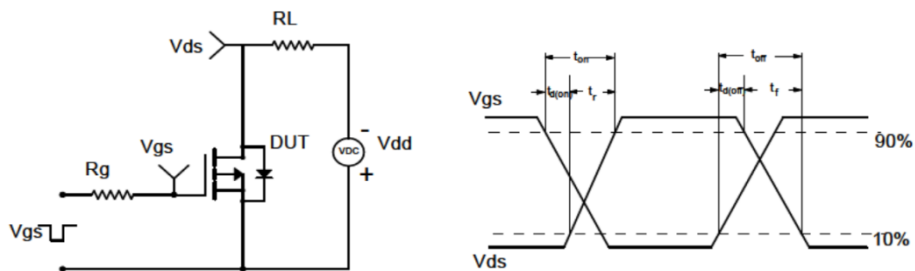
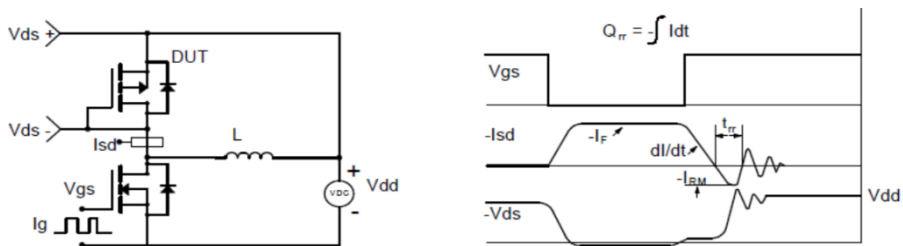
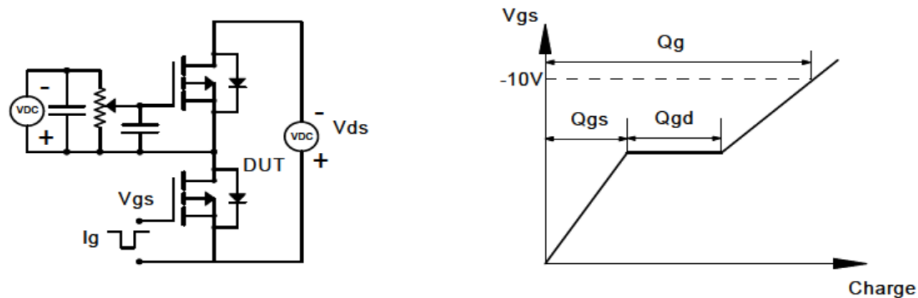


Diode Recovery Test Circuit and Waveforms(N-Channel)



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

Kwansemi Semiconductor Co.,Ltd

Email:Sales@kwansemi.com

Web:www.kwansemi.com

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