

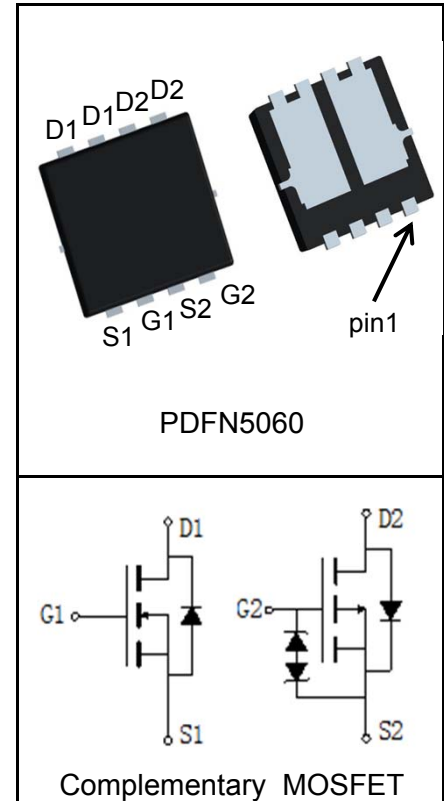
Features

- N-Channel
30V/30A,
 $R_{DS(ON)} = 7.5m\Omega(Typ.) @ V_{GS}=10V$
 $R_{DS(ON)} = 10m\Omega(Typ.) @ V_{GS}=4.5V$
- P-Channel
-30V/-30A,
 $R_{DS(ON)} = 13m\Omega(Typ.) @ V_{GS}=-10V$
 $R_{DS(ON)} = 22m\Omega(Typ.) @ V_{GS}=-4.5V$
- Fast Switching Speed
 - ESD Protected
- Low gate Charge
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- Load Switch

Pin Description



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	20	-20	A
Mounted on Large Heat Sink					
I _{DP} ^①	300μs Pulse Drain Current Tested	T _A =25°C	120	-120	A
I _D ^②	Continuous Drain Current(V _{GS} =±10V)	T _A =25°C	30	-30	A
		T _A =100°C	19	-19	
P _D	Maximum Power Dissipation	T _A =25°C	42	36	W
		T _A =100°C	17	14	
R _{θJC}	Thermal Resistance-Junction to Case		3	3.5	°C/W
R _{θJA} ^③	Thermal Resistance-Junction to Ambient		50	50	°C/W
Drain-Source Avalanche Ratings					
E _{AS} ^④	Avalanche Energy, Single Pulsed		42	42	mJ

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

Symbol	Parameter	Test Condition	RU30C30M			Unit
			Min.	Typ.	Max.	
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		
		V _{DS} =-30V, V _{GS} =0V	P		-1	
				T _J =125°C		
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	N	1	2.5	V
		V _{DS} =V _{GS} , I _{DS} =-250μA	P	-1	-2.5	
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	N		±1	μA
		V _{GS} =±20V, V _{DS} =0V	P		±10	
R _{DS(ON)} ^⑤	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =20A	N		7.5	mΩ
		V _{GS} =-10V, I _{DS} =-20A	P		13	
		V _{GS} =4.5V, I _{DS} =16A	N		10	
		V _{GS} =-4.5V, I _{DS} =-16A	P		22	
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	N		1.2	V
		I _{SD} =-20A, V _{GS} =0V	P		-1.3	
t _{rr}	Reverse Recovery Time	N-Channel I _{SD} =20A, dI _{SD} /dt=100A/μs	N		24	ns
			P		45	
Q _{rr}	Reverse Recovery Charge	P-Channel I _{SD} =-20A, dI _{SD} /dt=100A/μs	N		16	nC
			P		26	
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	N		1.2	Ω
			P		1.8	
C _{iss}	Input Capacitance	N-Channel V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	N		780	pF
			P		1560	
C _{oss}	Output Capacitance		N		190	
			P		245	
C _{rss}	Reverse Transfer Capacitance		N		70	
			P		135	

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

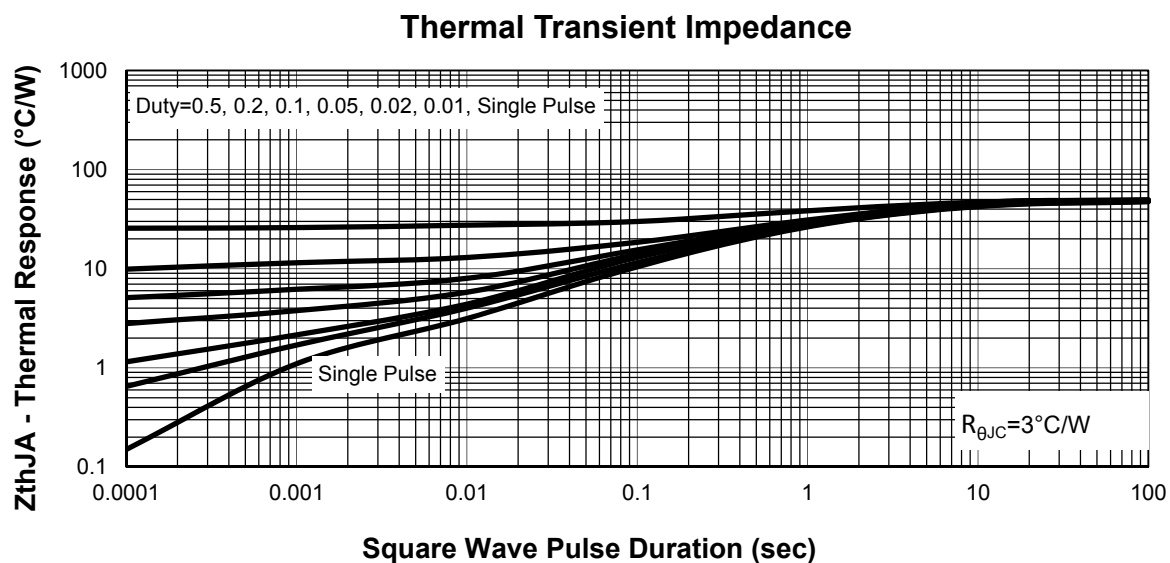
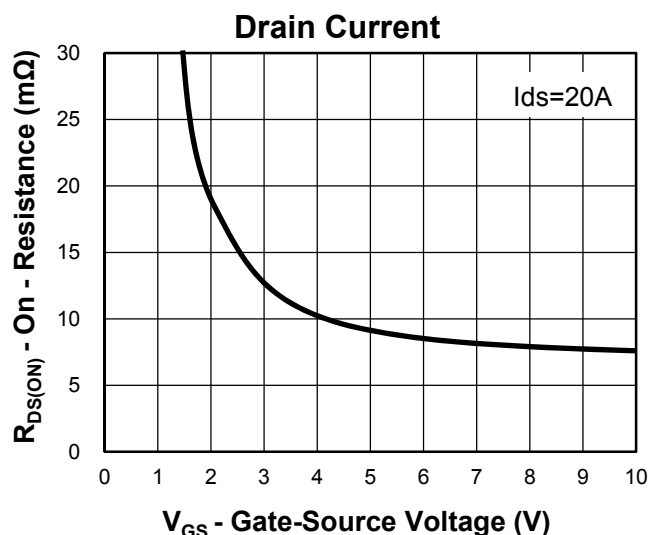
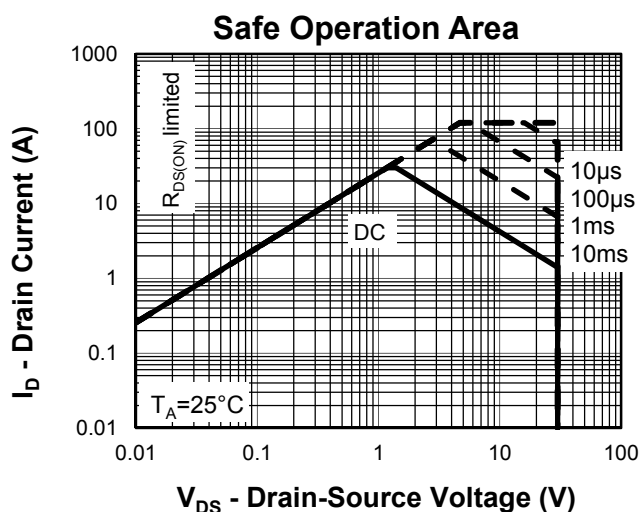
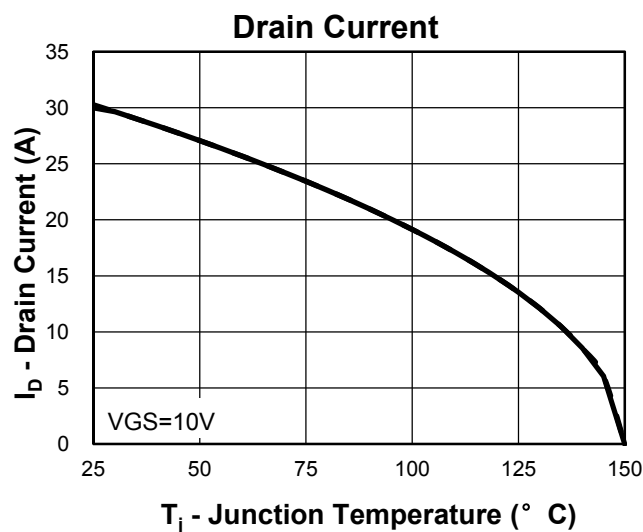
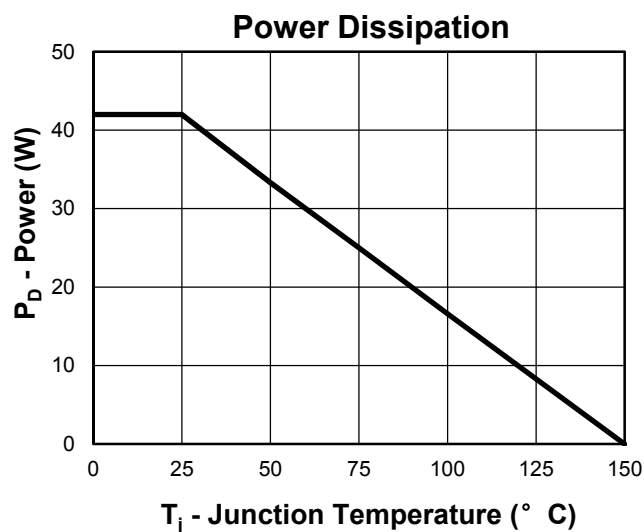
Symbol	Parameter	Test Condition	RU30C30M			Unit	
			Min.	Typ.	Max.		
Dynamic Characteristics ^⑥							
t _{d(ON)}	Turn-on Delay Time	N-Channel V _{DD} =15V, I _{DS} =20A, V _{GEN} =10V, R _G =4.7Ω	N		6	ns	
t _r	Turn-on Rise Time		P		27		
			N		8		
			P		32		
		t _{d(OFF)}	Turn-off Delay Time	P-Channel V _{DD} =-15V, I _{DS} =-20A, V _{GEN} = -10V, R _G =4.7Ω	N		
P					37		
t _f	Turn-off Fall Time			N			4
				P			14
Gate Charge Characteristics ^⑥							
Q _g	Total Gate Charge	N-Channel V _{DS} =24V, V _{GS} =10V, I _{DS} =20A	N		18	nC	
			P		42		
Q _{gs}	Gate-Source Charge		P-Channel V _{DS} =-24V, V _{GS} = -10V, I _{DS} =-20A	N			6
				P			9
Q _{gd}	Gate-Drain Charge	N			5		
		P			13		

- 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, $t \leq 10\text{sec}$.
 - ④ Limited by T_{Jmax} , $I_{AS}=13\text{A}$, $V_{DD}=24\text{V}$, $R_G=50\Omega$, Starting $T_J=25^{\circ}\text{C}$.
 - ⑤ Pulse test ; Pulse width 300s, duty cycle 2%.
 - ⑥ Guaranteed by design, not subject to production testing.

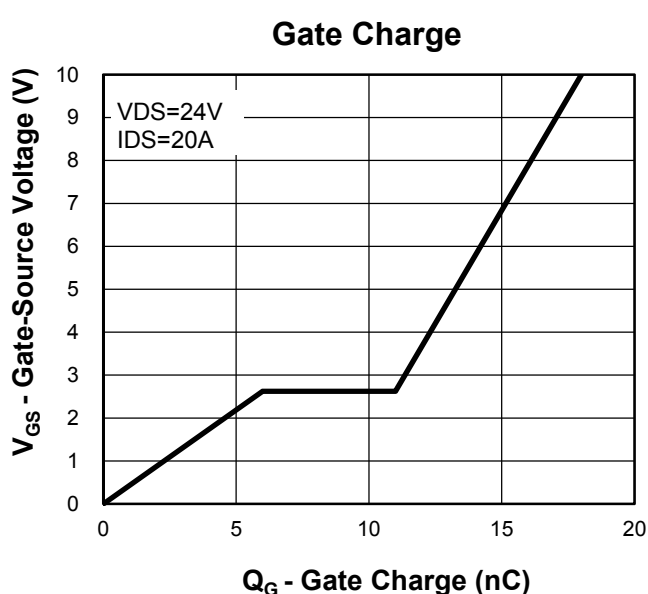
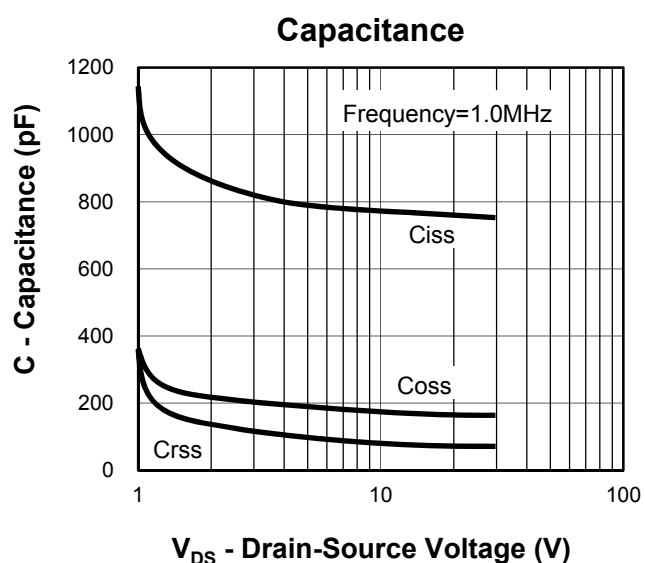
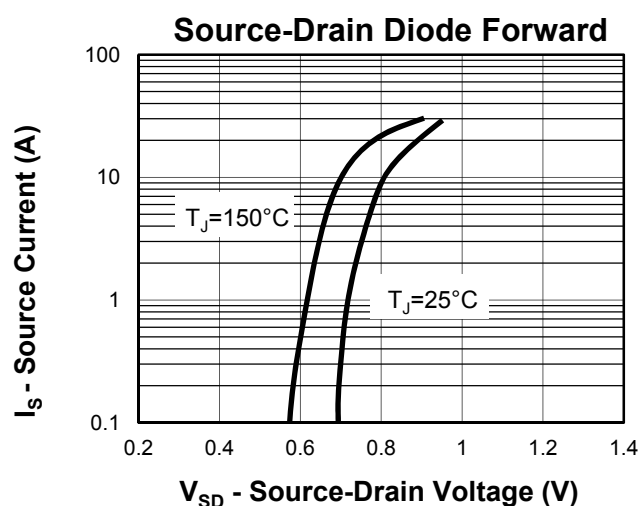
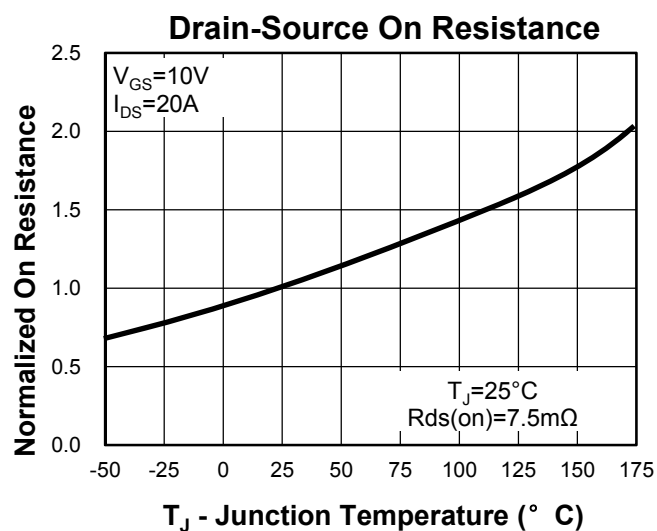
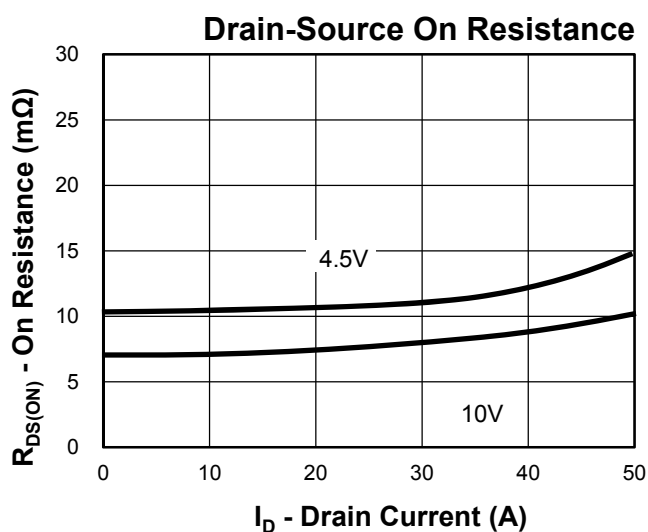
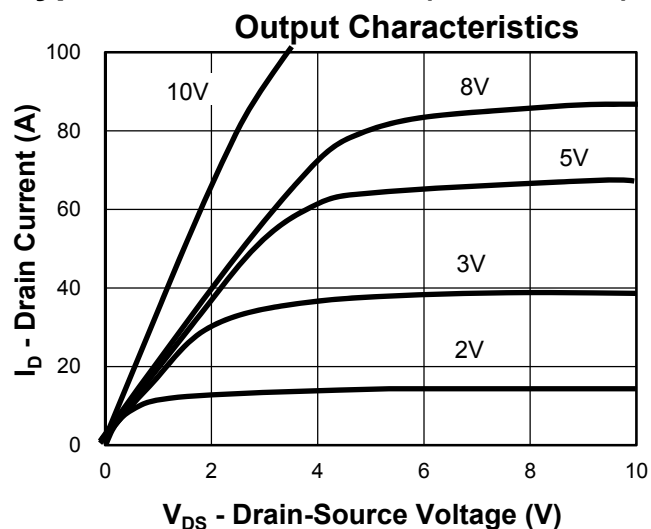
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU30C30M	RU30C30M	PDFN5060	Tape&Reel	3000	13"	12mm

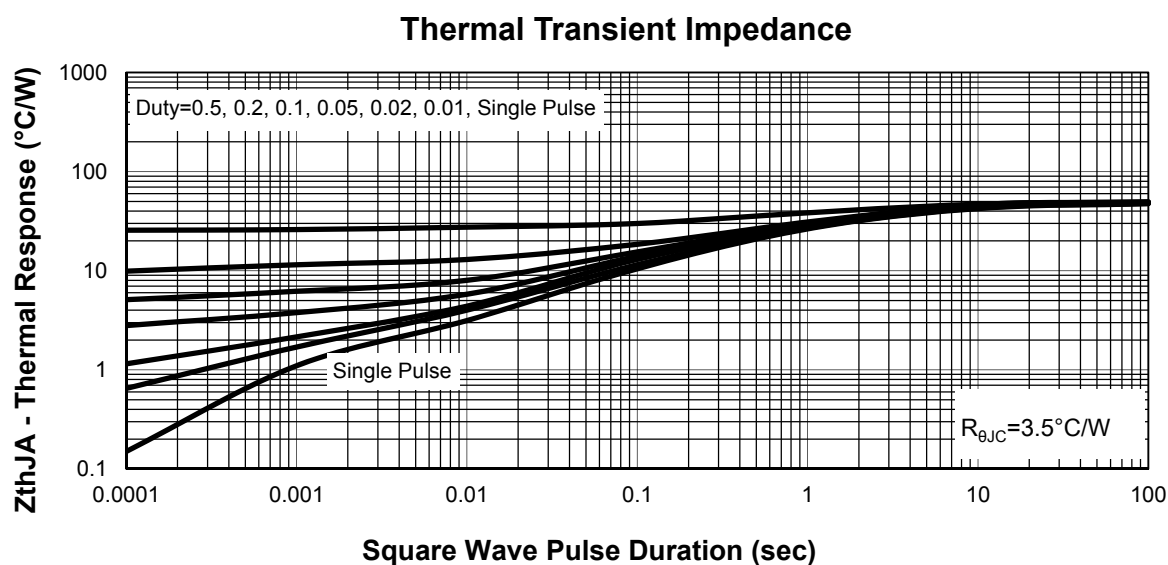
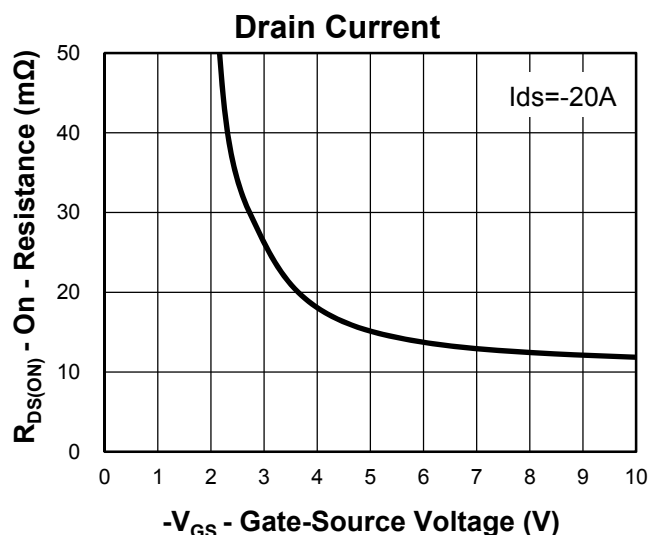
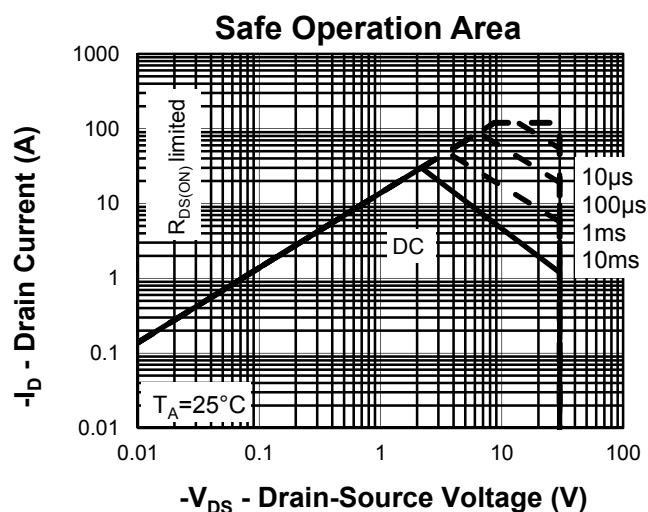
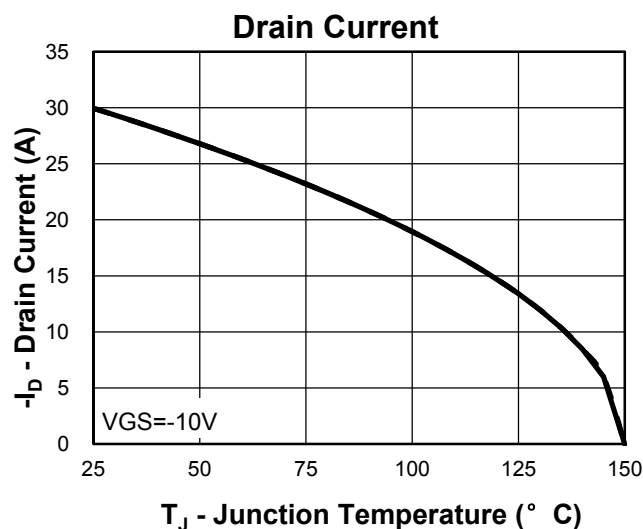
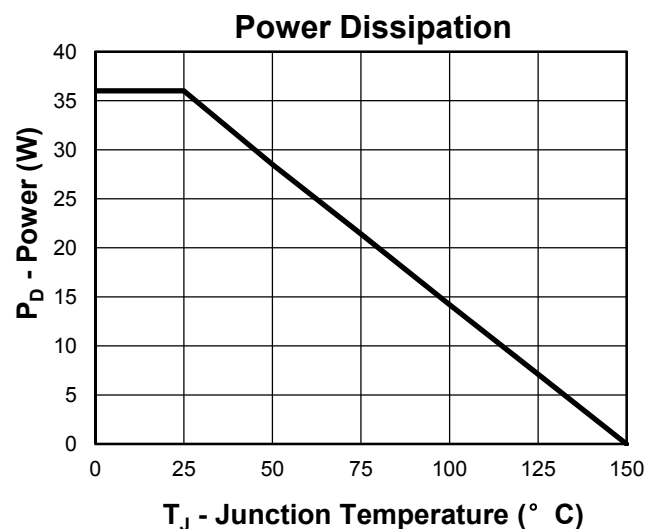
Typical Characteristics(N-Channel)



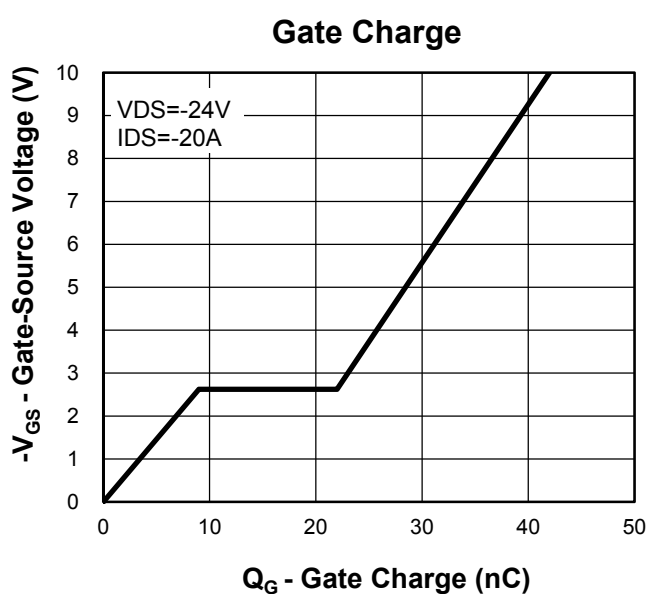
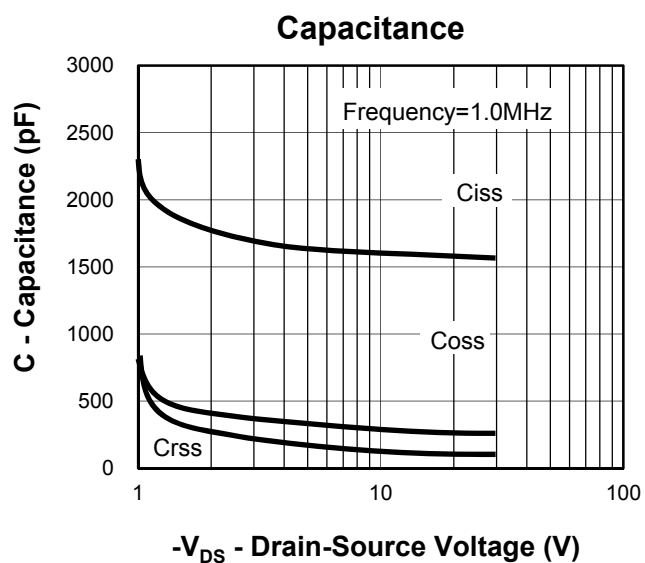
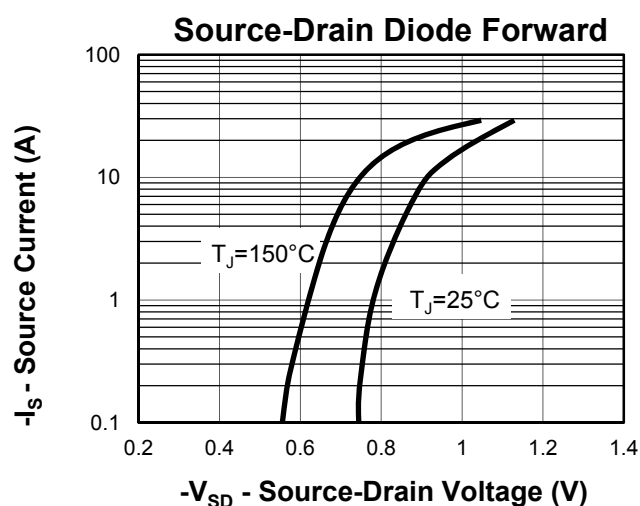
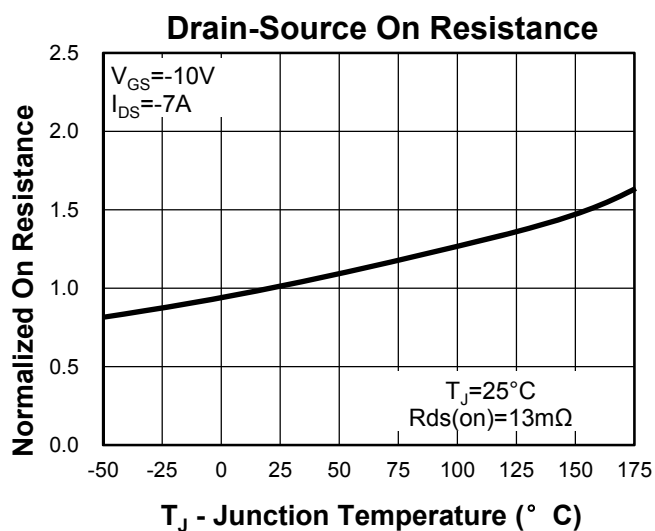
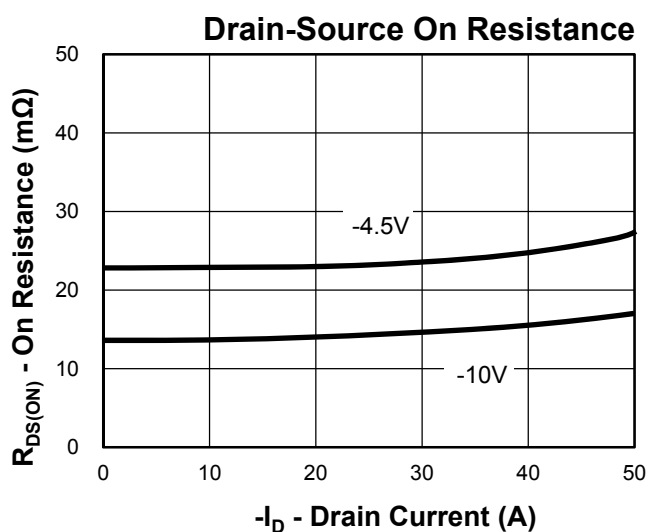
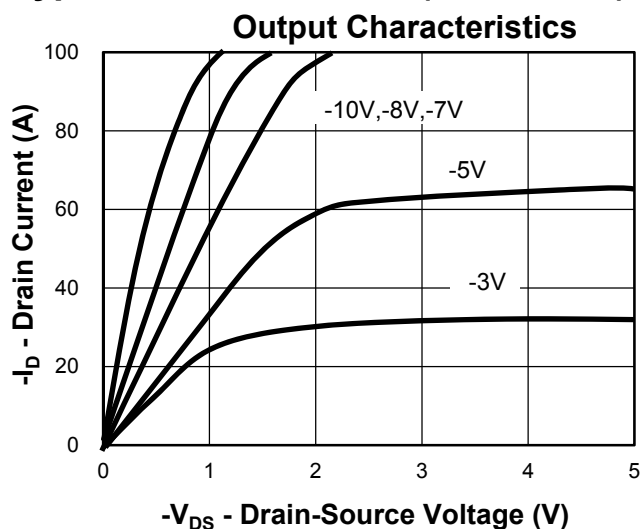
Typical Characteristics(N-Channel)



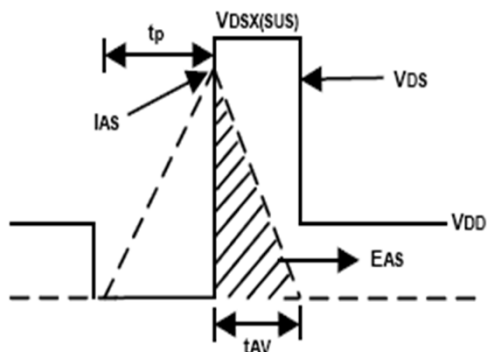
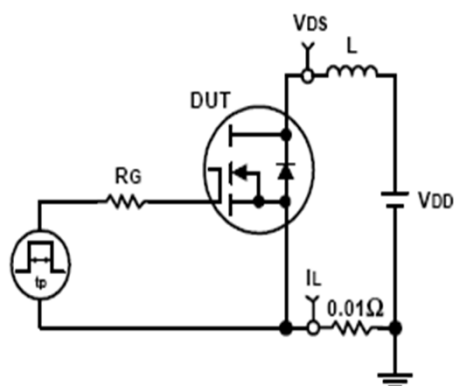
Typical Characteristics(P-Channel)



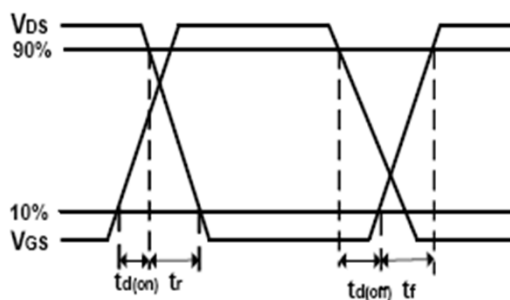
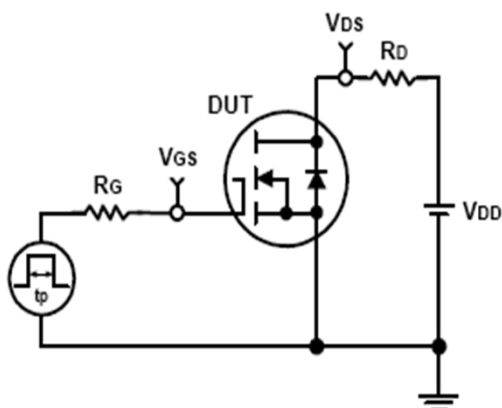
Typical Characteristics(P-Channel)



Avalanche Test Circuit and Waveforms

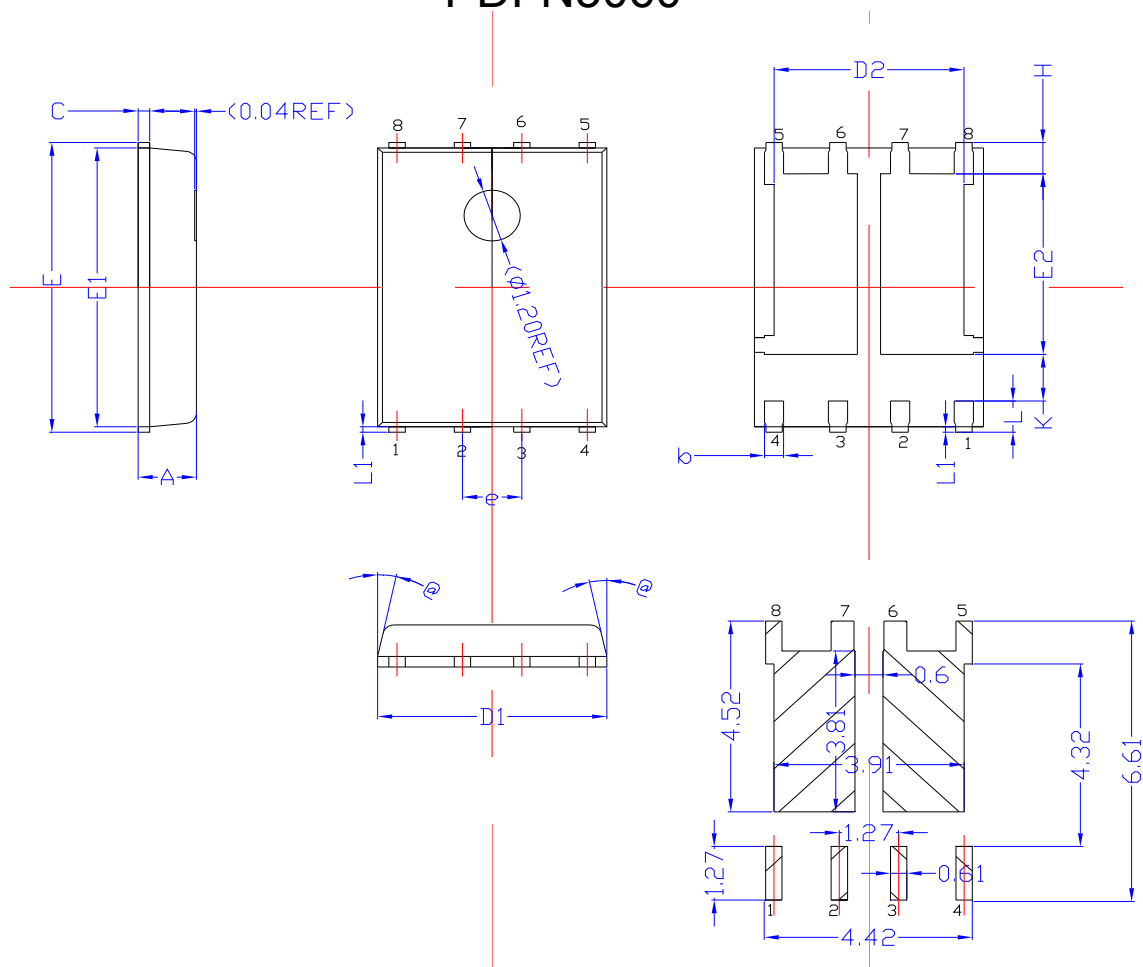


Switching Time Test Circuit and Waveforms



Package Information

PDFN5060



NOTE:

- 1: ALL UNITS ARE IN MILLIMETER.
- 2: EJECTOR PIN MARK POSITION MAY VARY FROM DIFFERENT MOLD.
- 3: ALL DIMENSIONS REFER TO JEDEC.DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043	E1	5.70	5.75	5.80	0.224	0.226	0.228
b	0.33	0.41	0.51	0.013	0.016	0.020	E2	3.38	3.58	3.78	0.133	0.141	0.149
c	0.20	0.25	0.30	0.008	0.010	0.012	e	1.27BSC			0.05BSC		
D1	4.80	4.90	5.00	0.189	0.193	0.197	H	0.41	0.51	0.61	0.016	0.020	0.024
D2	3.61	3.81	3.96	0.142	0.150	0.156	L	0.51	0.61	0.71	0.020	0.024	0.028
L1	0.06	0.13	0.20	0.002	0.005	0.008							
E	5.90	6.00	6.10	0.232	0.236	0.240	@	0°	*	12°	*	10°	12°
K	1.10	*	*	0.043	*	*	M	0.50	*	*	0.020	*	*

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