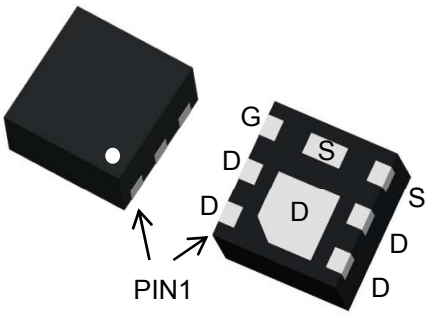
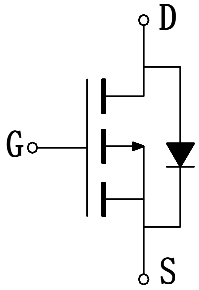
Features

- -16V/-8A,
  $R_{DS\ (ON)}$ =40mΩ(Typ.)@V_{GS}=-4.5V
  $R_{DS\ (ON)}$ =65mΩ(Typ.)@V_{GS}=-2.5V
- Super High Dense Cell Design
- Fast Switching Speed
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description



SDFN2020



P-Channel MOSFET

Applications

- Load Switch
- Battery Charge
- DC/DC Converters

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		-16	V
V_{GSS}	Gate-Source Voltage		±12	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	-14	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	-56	A
I_D ②	Continuous Drain Current@T_C(V_{GS}=-4.5V)	T_C=25°C	-14	A
		T_C=100°C	-9	
	Continuous Drain Current@T_A(V_{GS}=-4.5V) ③	T_A=25°C	-8	
		T_A=70°C	-5.6	
P_D	Maximum Power Dissipation@T_C	T_C=25°C	17.8	W
		T_C=100°C	7.1	
	Maximum Power Dissipation@T_A ③	T_A=25°C	2.5	
		T_A=70°C	1.6	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	7	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient	50	°C/W
Drain-Source Avalanche Ratings			
E_{AS} ④	Avalanche Energy, Single Pulsed	TBD	mJ

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

Symbol	Parameter	Test Condition	RU16P8M4			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=-250μA	-16			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-16V, V_{GS}=0V			-1	μA
		T_J=125°C			-30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=-250μA	-0.4		-1.1	V
I_{GSS}	Gate Leakage Current	V_{GS}=±12V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=-4.5V, I_{DS}=-4A		40	50	mΩ
		V_{GS}=-2.5V, I_{DS}=-3A		65	80	mΩ
Diode Characteristics						
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=-1A, V_{GS}=0V			-1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=-4A, dI_{SD}/dt=100A/μs		8		ns
Q_{rr}	Reverse Recovery Charge			3		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		0.6		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-8V, Frequency=1.0MHz		500		pF
C_{oss}	Output Capacitance			90		
C_{rss}	Reverse Transfer Capacitance			45		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-8V,I_{DS}=-4A, V_{GEN}=-4.5V,R_G=6Ω		5		ns
t_r	Turn-on Rise Time			10		
$t_{d(OFF)}$	Turn-off Delay Time			21		
t_f	Turn-off Fall Time			9		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	V_{DS}=-12V, V_{GS}=-4.5V, I_{DS}=-4A		8		nC
Q_{gs}	Gate-Source Charge			1.3		
Q_{gd}	Gate-Drain Charge			2.5		

Notes:

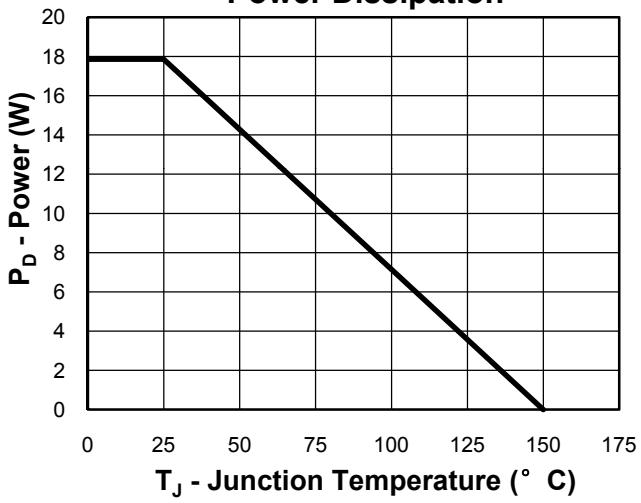
①Pulse width limited by safe operating area.
②Calculated continuous current based on maximum allowable junction temperature.
③When mounted on 1 inch square copper board, t≤10sec.
④Limited by T_{Jmax}, Starting T_J = 25°C.
⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.
⑥Guaranteed by design, not subject to production testing.

Ordering and Marking Information

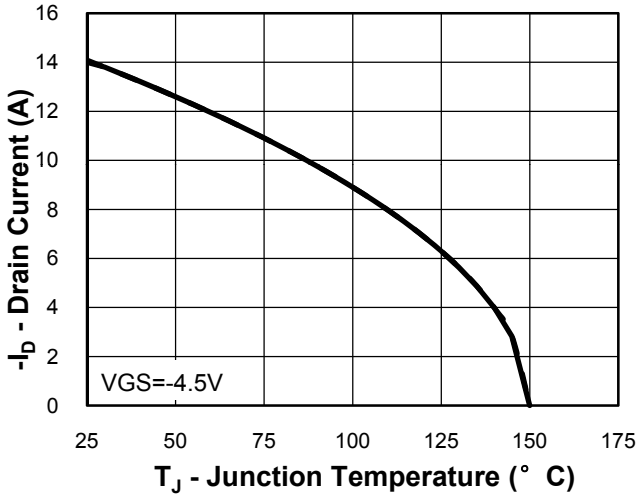
Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU16P8M4	16P8	SDFN2020	Tape&Reel	3000	7''	8mm

Typical Characteristics

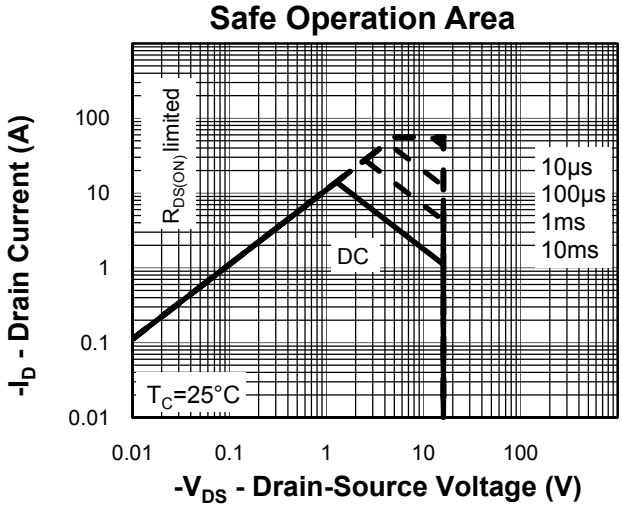
Power Dissipation



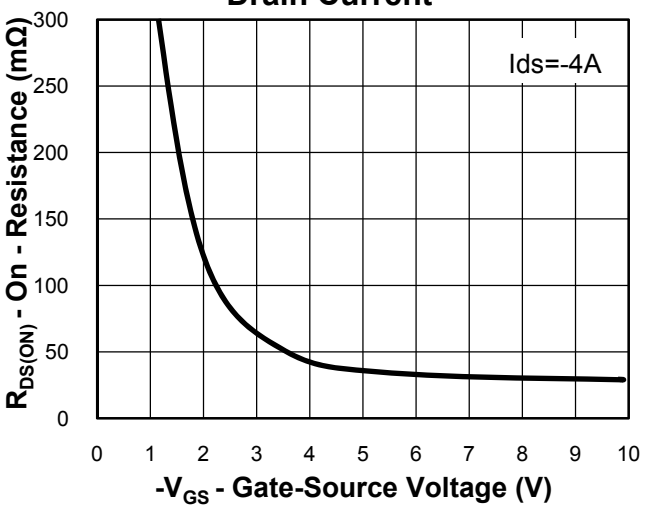
Drain Current



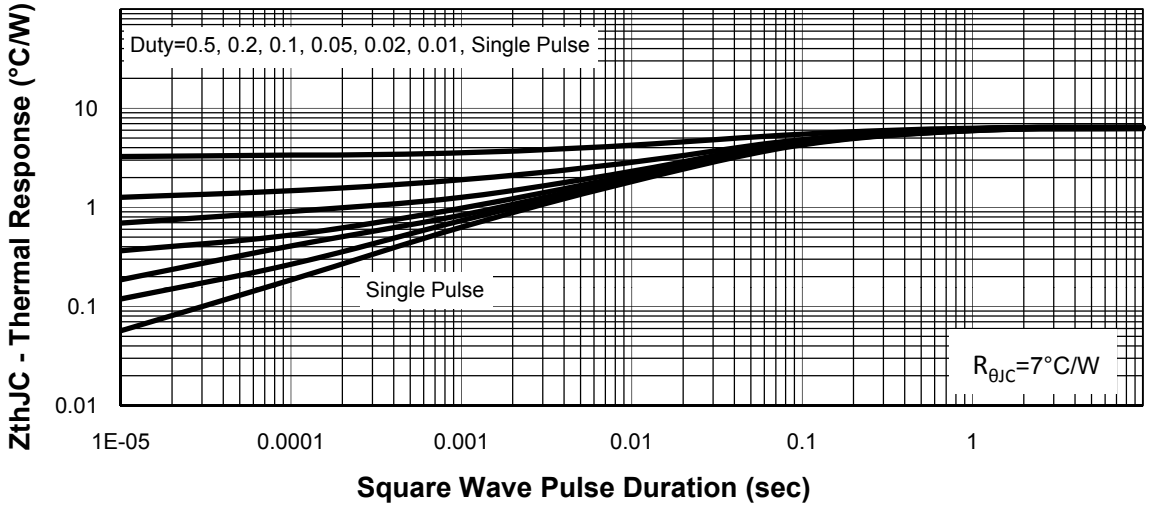
Safe Operation Area



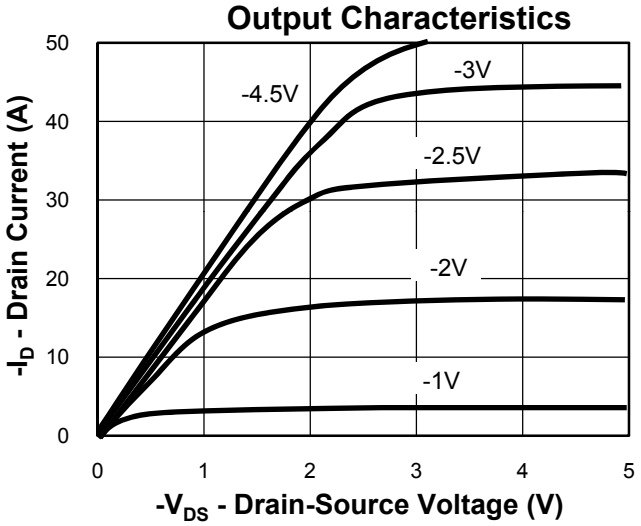
Drain Current

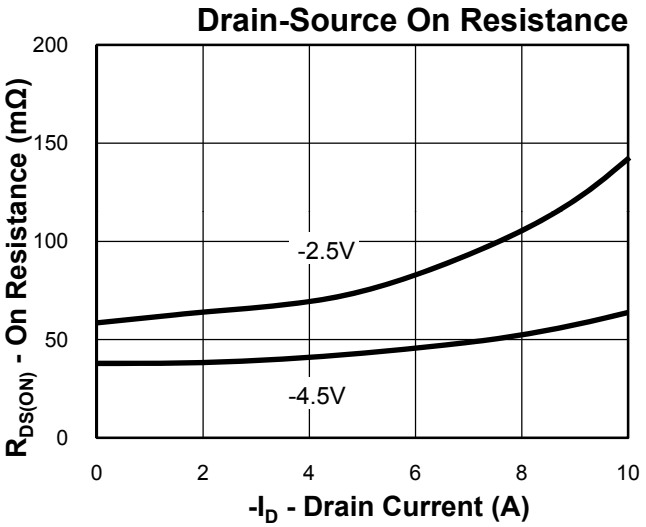


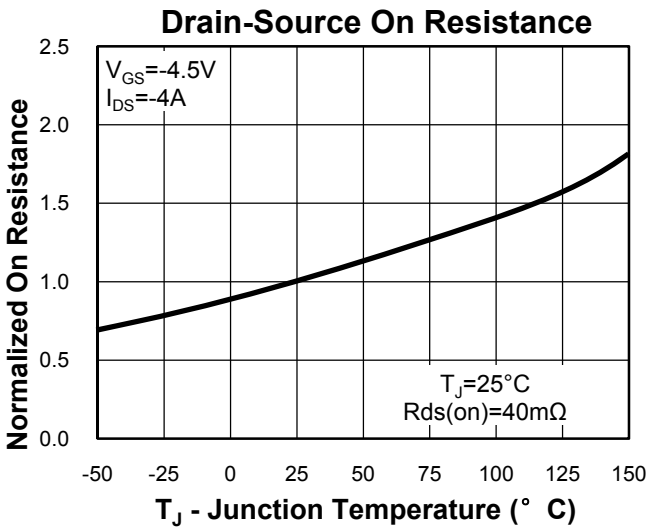
Thermal Transient Impedance

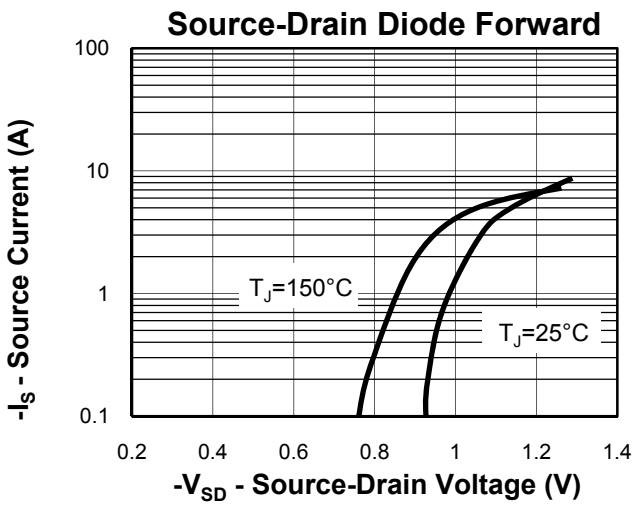


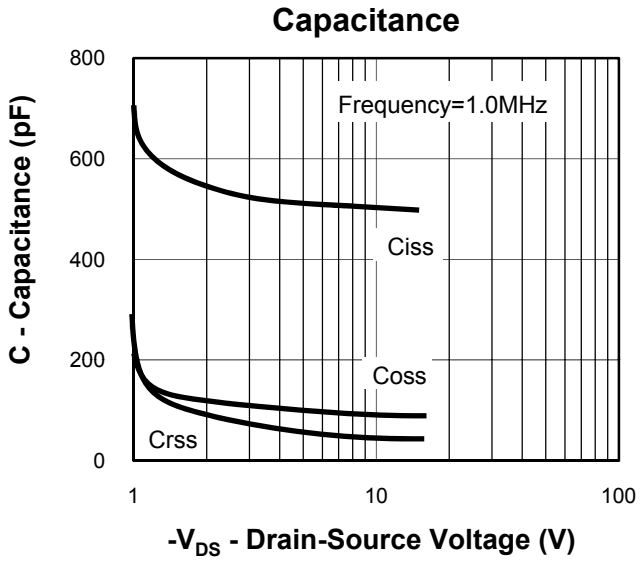
Typical Characteristics

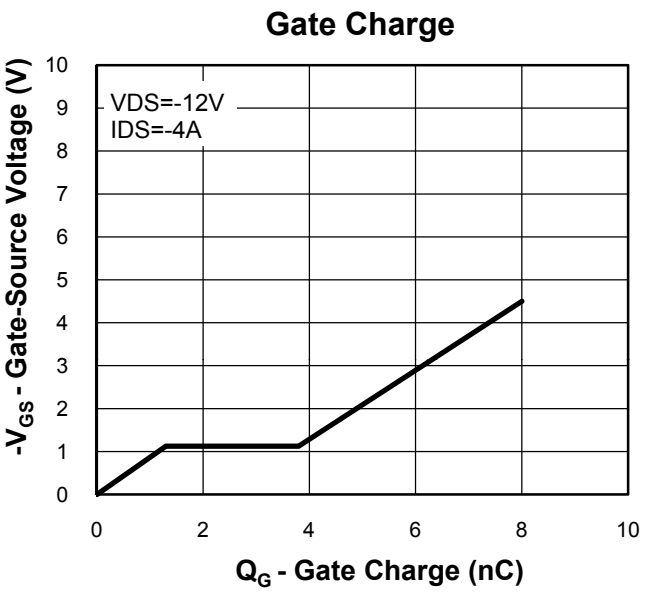




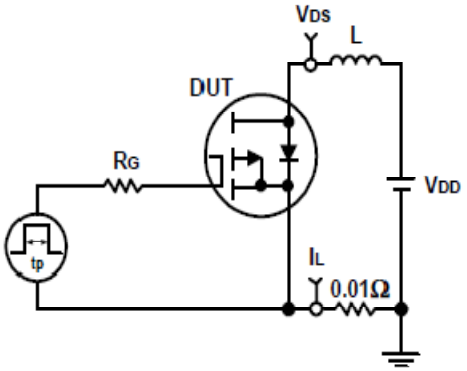


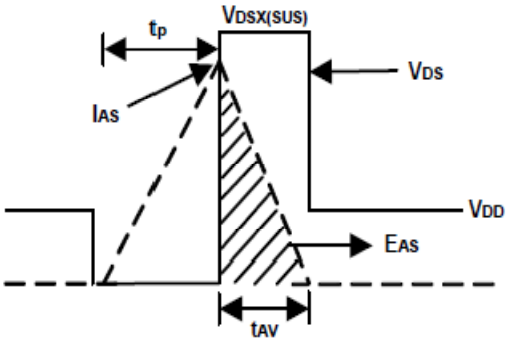




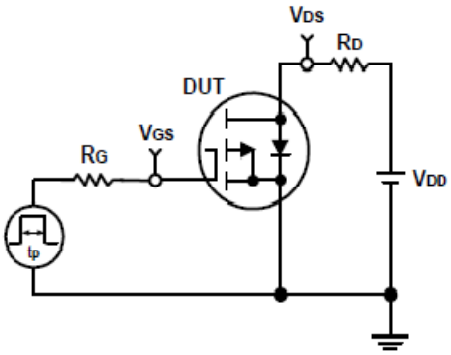


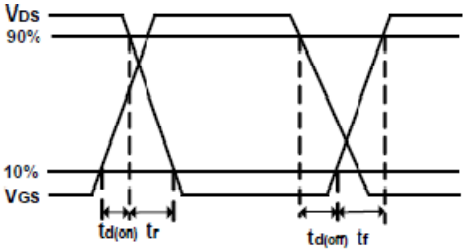
Avalanche Test Circuit and Waveforms





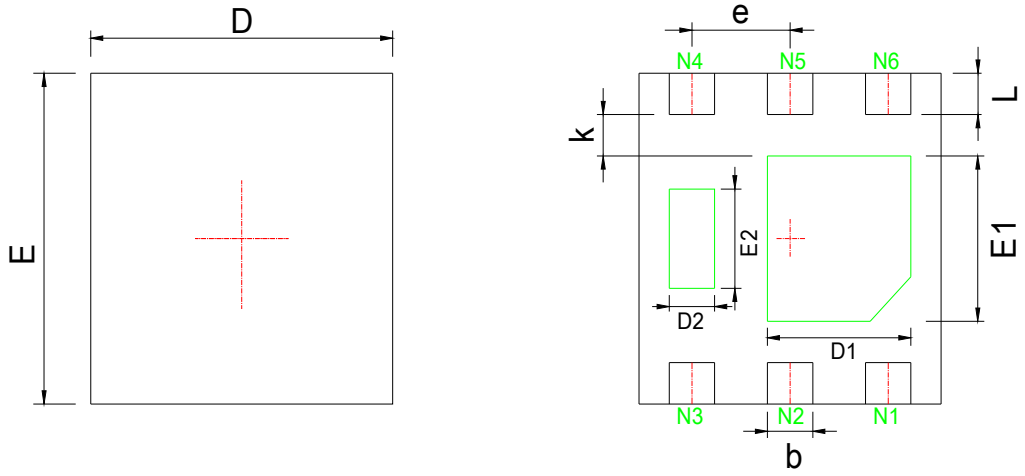
Switching Time Test Circuit and Waveforms



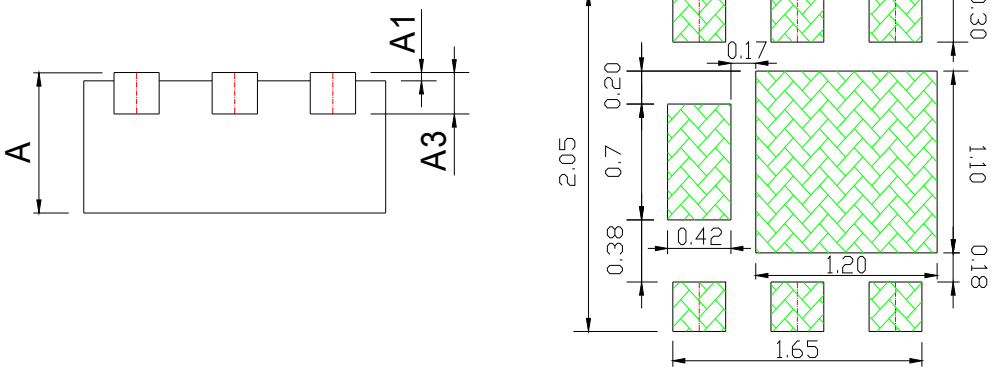


Package Information

SDFN2020



Land Pattern
(Only for Reference)



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.750	0.800	0.028	0.030	0.031
A1	0.000	0.025	0.050	0.000	0.001	0.002
A3	0.203 REF.			0.008 REF.		
D	1.924	2.000	2.076	0.076	0.079	0.082
E	1.924	2.000	2.076	0.076	0.079	0.082
D1	0.800	0.900	1.000	0.031	0.035	0.039
E1	0.850	0.950	1.050	0.033	0.037	0.041
D2	0.200	0.300	0.400	0.008	0.012	0.016
E2	0.460	0.560	0.660	0.018	0.022	0.026
K	0.200 MIN.			0.008 MIN.		
b	0.250	0.300	0.350	0.010	0.012	0.014
e	0.650 TYP			0.026 TYP		
L	0.174	0.250	0.326	0.007	0.010	0.013

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