

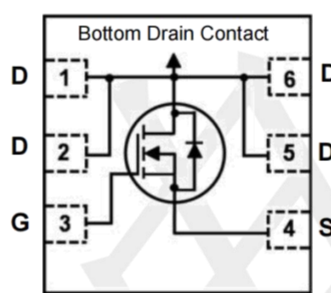
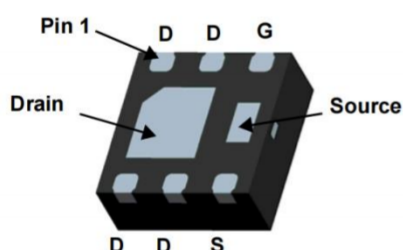
Product Summary

- V_{DS} 30 V
- I_{DS} (at $V_{GS}=10V$) 7.8 A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $\leq 20m\Omega$

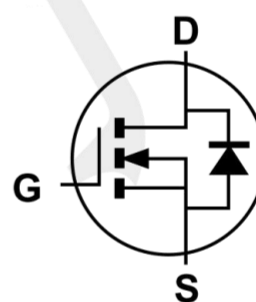
Application

- DC – DC Buck Converters
- Load switch
- Power management
- Motor Control
- Portable Power Adaptors

Package and Pin Configuration



Circuit diagram



Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	30	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current	Steady State	TA=25°C	I _D	7.8	A
		TA=70°C		6.2	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			IDM	31.2	A

Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Total Power Dissipation (Note 1)	PD	2.01	W
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 1)	$R_{\theta JC}$	18	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Notes: 1. Device mounted on 1" $\times$ 1" FR-4 PCB with high coverage 2oz. Copper, single sided.

Electrical Characteristics (@ TA = +25°C, unless otherwise specified.)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS (Note 2)						
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BVDSS	30	--	--	V
Zero Gate Voltage Drain Current TJ = +25°C	$V_{DS}=30V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Source Leakage	$V_{DS}=0V, V_{GS}=\pm 20V$	I_{GSS}	--	--	± 100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	1.2	1.8	2.5	V
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=4A$	$R_{DS(on)}$	--	15	20	m Ω
	$V_{GS}=4.5V, I_D=3A$		--	21	30	
Diode Forward Voltage	$V_{GS} = 0V, I_S = 1A$	VSD	--	0.7	1.2	V
DYNAMIC CHARACTERISTICS (Note 3)						
Input Capacitance	$V_{DS} = 25V,$ $V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	370	--	pF
Output Capacitance		C_{oss}	--	70	--	
Reverse Transfer Capacitance		C_{rss}	--	50	--	
Total Gate Charge ($V_{GS} = 10V$)	$V_{DS} = 15V,$ $V_{GS} = 10V,$ $I_D = 4A$	Q_g	--	5.2	--	nC
Total Gate Charge ($V_{GS} = 4.5V$)			--	3.6	--	
Gate-Source Charge		Q_{gs}	--	0.6	--	
Gate-Drain Charge		Q_{gd}	--	2.0	--	
Turn-On Delay Time	$V_{DD} = 15V,$ $V_{GS} = 10V,$ $I_D = 1A,$ $R_G = 6\Omega$	$t_{D(ON)}$	--	2.8	--	nS
Turn-On Delay Time		t_R	--	7.2	--	
Turn-Off Delay Time		$t_{D(OFF)}$	--	15.8	--	
Turn-Off Fall Time		t_F	--	4.6	--	
Body Diode Reverse Recovery Time	$I_S = 2A,$ $di/dt = 100A/\mu s$	t_{RR}	--	7.6	--	

Notes: 2. Short duration pulse test used to minimize self-heating effect.
3. Guaranteed by design. Not subject to product testing.

Typical Performance Characteristics (TA=25°C unless otherwise Specified)

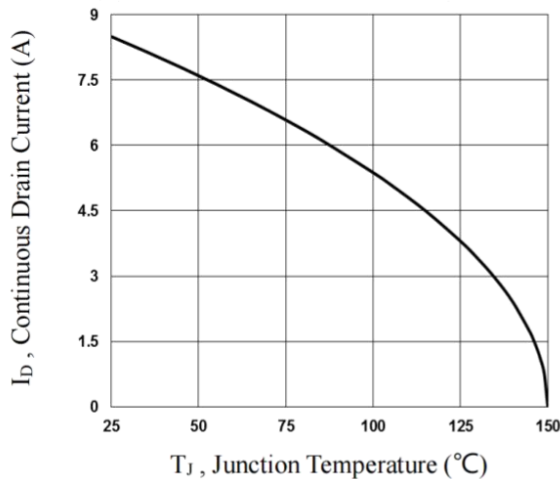


Fig.1 Continuous Drain Current vs. T_J

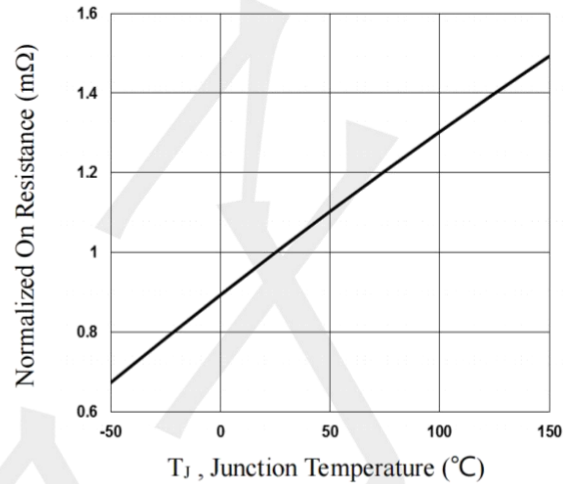


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

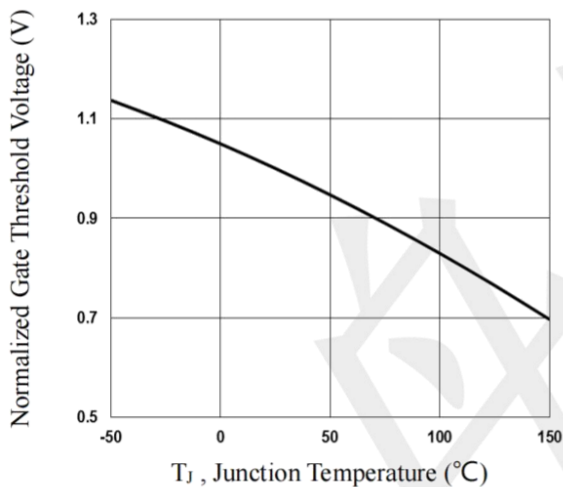


Fig.3 Normalized V_{th} vs. T_J

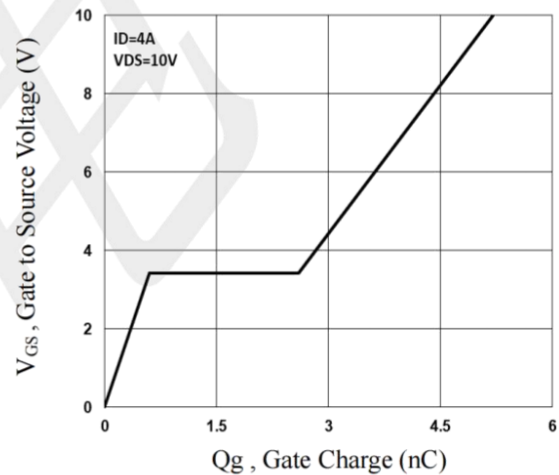


Fig.4 Gate Charge Waveform

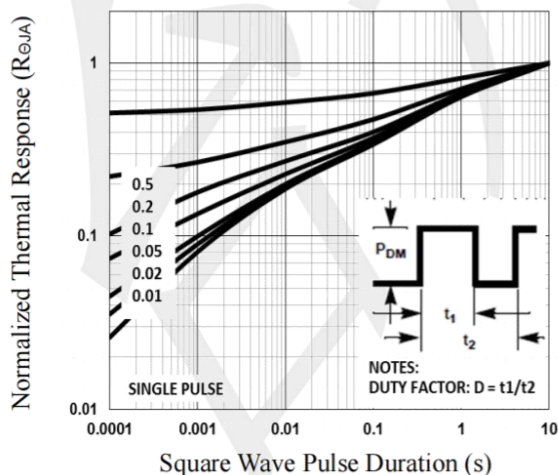


Fig.5 Normalized Transient Response

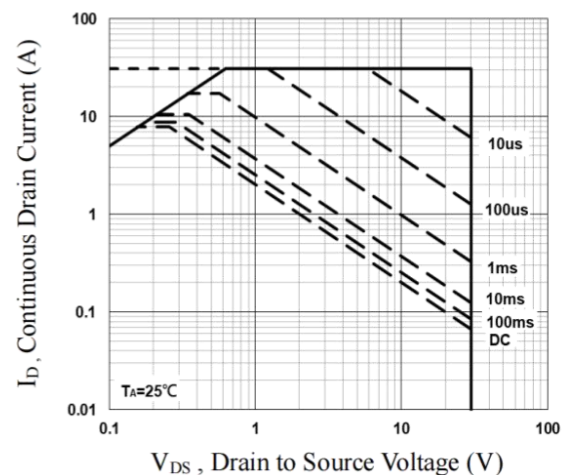
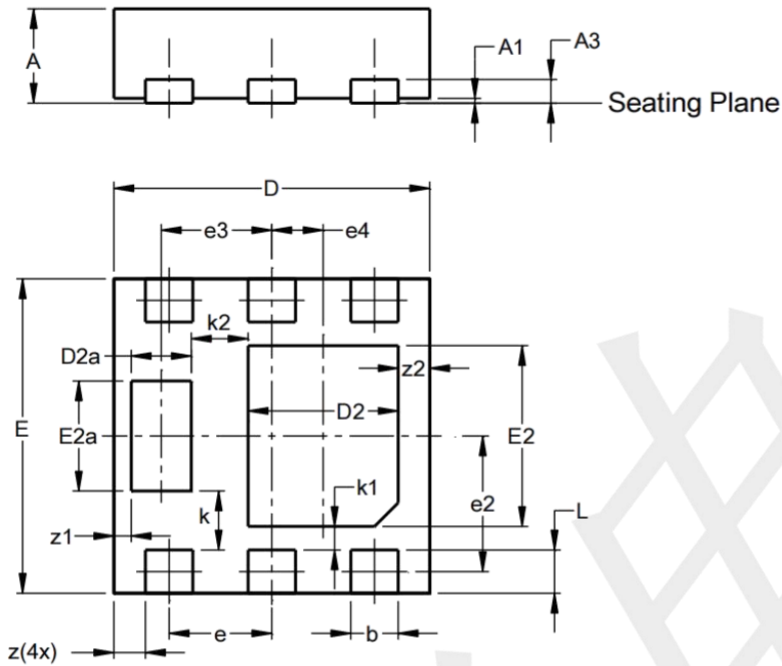


Fig.6 Maximum Safe Operation Area

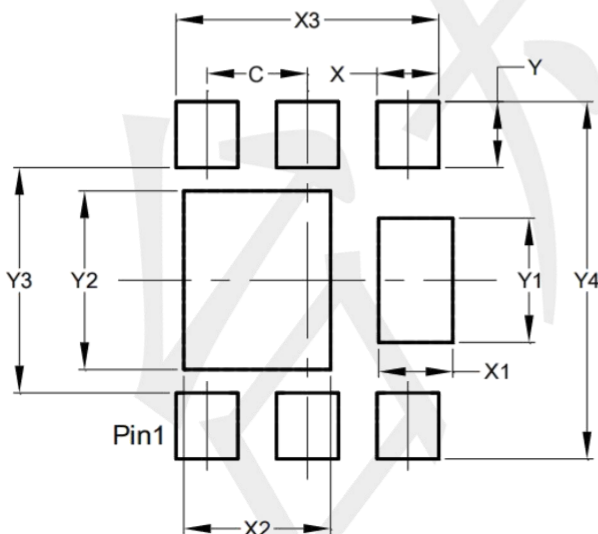
Package Outline Dimensions (unit: mm)

U-DFN2020-6 (Type F)



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Dim	Min	Max	Typ
A	0.57	0.63	0.60
A1	0.00	0.05	0.03
A3	-	-	0.15
b	0.25	0.35	0.30
D	1.95	2.05	2.00
D2	0.85	1.05	0.95
D2a	0.33	0.43	0.38
E	1.95	2.05	2.00
E2	1.05	1.25	1.15
E2a	0.65	0.75	0.70
e	0.65 BSC		
e2	0.863 BSC		
e3	0.70 BSC		
e4	0.325 BSC		
k	0.37 BSC		
k1	0.15 BSC		
k2	0.36 BSC		
L	0.225	0.325	0.275
z	0.20 BSC		
z1	0.110 BSC		
z2	0.20 BSC		
All Dimensions in mm			

Mounting Pad Layout (unit: mm)



Dimensions	Value (in mm)
C	0.650
X	0.400
X1	0.480
X2	0.950
X3	1.700
Y	0.425
Y1	0.800
Y2	1.150
Y3	1.450
Y4	2.300