

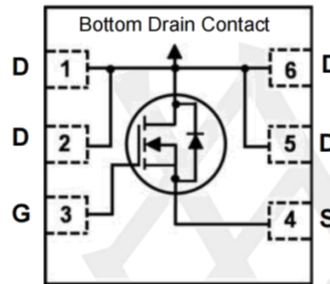
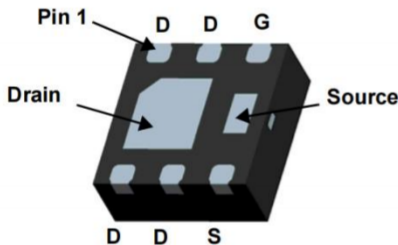
### Product Summary

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

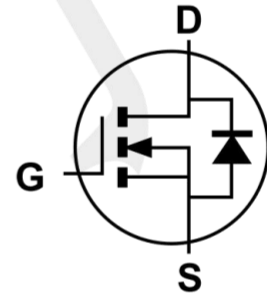
### Application

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

### Package and Pin Configuration



### Circuit diagram



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

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	$V_{DSS}$	30	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current	Steady State	$T_A=25^\circ C$	7.8	A
		$T_A=70^\circ C$	6.2	A
Pulsed Drain Current (10 $\mu s$ Pulse, Duty Cycle = 1%)	$I_{DM}$	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	$^\circ C/W$
Thermal Resistance, Junction to Case (Note 1)	$R_{\theta JC}$	18	$^\circ C/W$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ C$

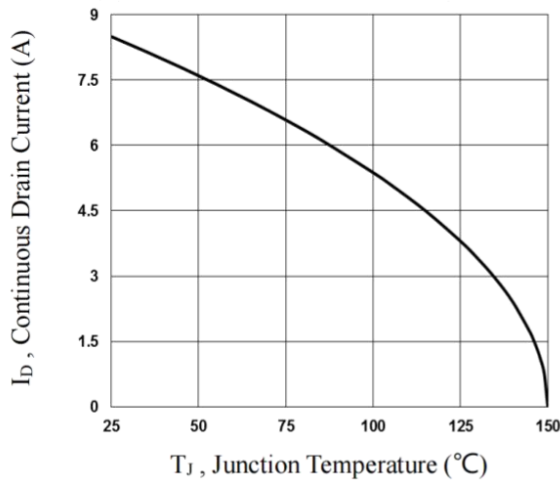
**Notes:** 1. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.

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

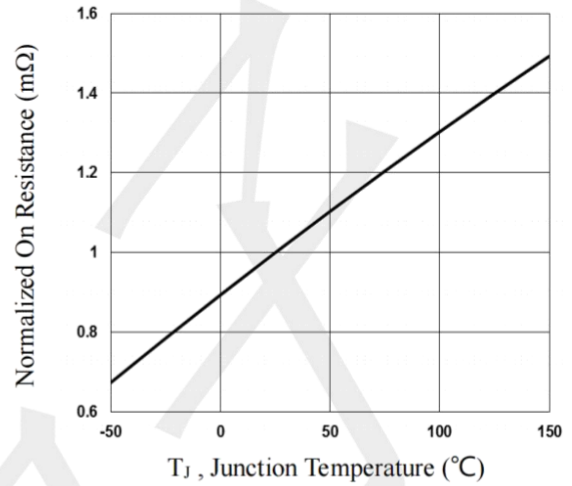
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT	
<b>OFF CHARACTERISTICS (Note 2)</b>							
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BVDSS	30	--	--	V	
Zero Gate Voltage Drain Current TJ = +25°C	$V_{DS}=30V, V_{GS}=0V$	$I_{DSS}$	--	--	1	$\mu A$	
Gate-Source Leakage	$V_{DS}=0V, V_{GS}=\pm 20V$	$I_{GSS}$	--	--	$\pm 100$	nA	
<b>ON CHARACTERISTICS (Note 2)</b>							
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 $\Omega$	
	$V_{GS}=4.5V, I_D=3A$		--	21	30		
Diode Forward Voltage	$V_{GS} = 0V, I_S = 1A$	VSD	--	0.7	1.2	V	
<b>DYNAMIC CHARACTERISTICS (Note 3)</b>							
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		$t_{RR}$	--	7.6	--		

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

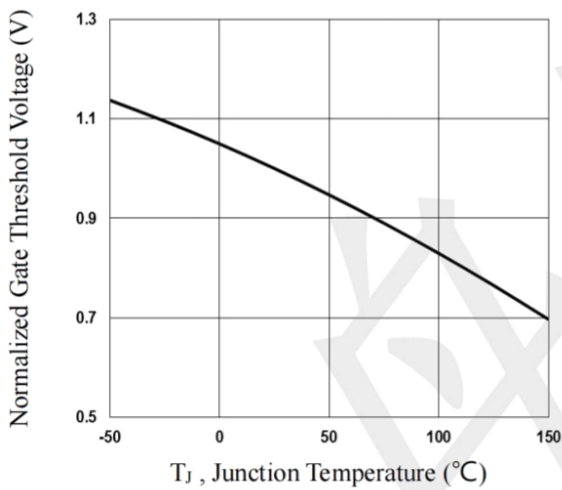
### Typical Performance Characteristics (TA=25°C unless otherwise Specified)



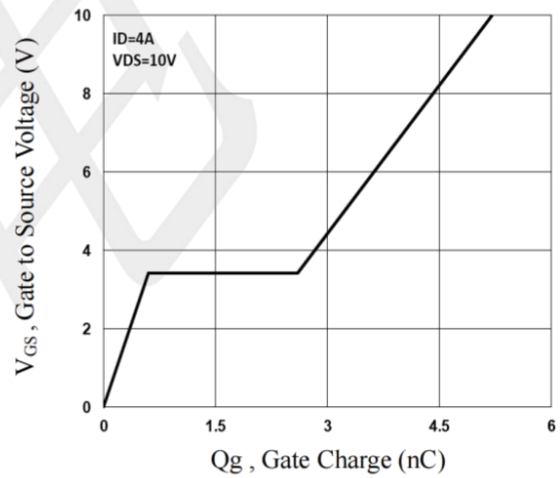
**Fig.1 Continuous Drain Current vs. T<sub>J</sub>**



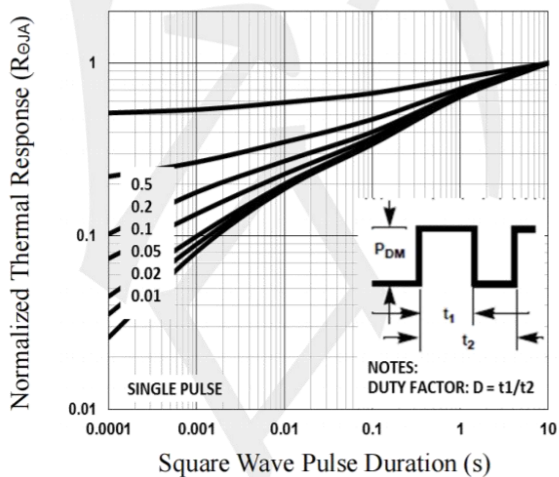
**Fig.2 Normalized R<sub>DS(on)</sub> vs. T<sub>J</sub>**



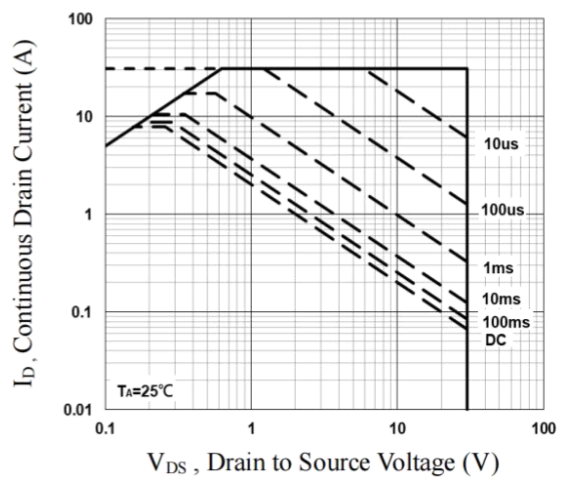
**Fig.3 Normalized V<sub>th</sub> vs. T<sub>J</sub>**



**Fig.4 Gate Charge Waveform**



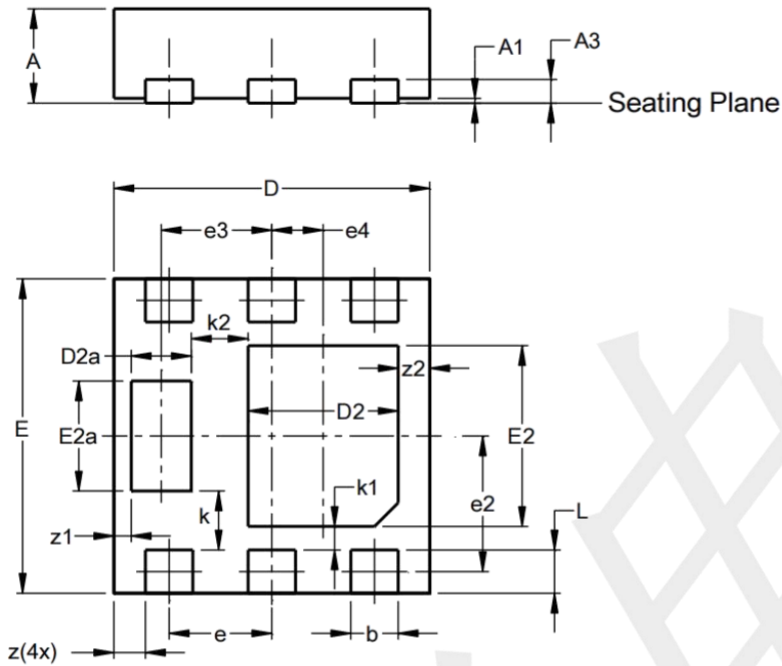
**Fig.5 Normalized Transient Response**



**Fig.6 Maximum Safe Operation Area**

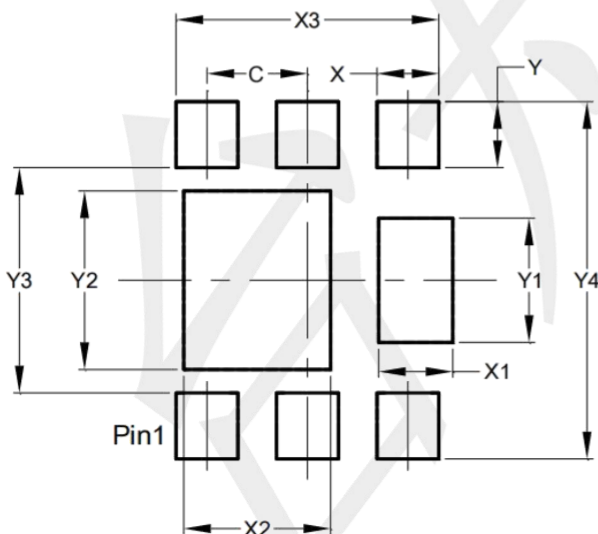
### Package Outline Dimensions (unit: mm)

U-DFN2020-6 (Type F)



U-DFN2020-6 (Type F)			
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