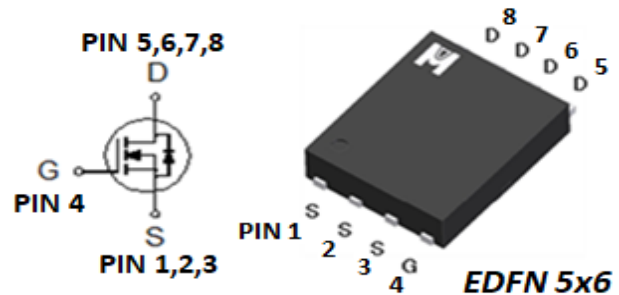


Single N-Channel Logic Level Enhancement Mode Field Effect Transistor

•Product Summary:

	N-CH
BVDSS	100V
$R_{DS(ON)(MAX.)@V_{GS}=10V}$	5.5mΩ
$R_{DS(ON)(MAX.)@V_{GS}=4.5V}$	7.5mΩ
$I_D @T_C=25^{\circ}C$	122.0A
$I_D @T_A=25^{\circ}C$	16.0A

• Pin Description:



Single N Channel MOSFET

UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free

•ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^{\circ}C$  Unless Otherwise Noted)



PARAMETERS/TEST CONDITIONS	SYMBOL	LIMITS	UNIT
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	$T_C = 25^{\circ}C$	122
		$T_C = 100^{\circ}C$	77
Continuous Drain Current	$I_D$	$T_A = 25^{\circ}C$	16
		$T_A = 70^{\circ}C$	13
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	196	A
Avalanche Current	$I_{AS}$	36	
Avalanche Energy	L = 0.1mH	EAS	64.8
Repetitive Avalanche Energy <sup>2</sup>	L = 0.05mH	EAR	32.4
Power Dissipation	$P_D$	$T_C = 25^{\circ}C$	138.9
		$T_C = 100^{\circ}C$	55.6
Power Dissipation	$P_D$	$T_A = 25^{\circ}C$	2.5
		$T_A = 70^{\circ}C$	1.6
Operating Junction & Storage Temperature Range	$T_j, T_{stg}$	-55 to 150	$^{\circ}C$

• 100% UIS testing in condition of  $V_D=15V, L=0.1mH, V_G=10V, I_L=22A$ , Rated  $V_{DS}=30V$  N-CH

•THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		0.9	$^{\circ}C/W$
Junction-to-Ambient <sup>3</sup>	$R_{\theta JA}$		50	

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Duty cycle  $< 1\%$

<sup>3</sup>50 $^{\circ}C$  / W when mounted on a 1 in<sup>2</sup> pad of 2 oz copper.

<sup>4</sup>Guarantee by Engineering test

•ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage <sup>4</sup>	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA	100			V
Gate Threshold Voltage <sup>4</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA	1.5	2	2.5	
Gate-Body Leakage <sup>4</sup>	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA
Zero Gate Voltage Drain Current <sup>4</sup>	I <sub>DSS</sub>	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V			1	uA
		V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125 °C			25	
On-State Drain Current <sup>1</sup>	I <sub>D(ON)</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V	122			A
Drain-Source On-State Resistance <sup>1,4</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A		4.8	5.5	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 20A		5.7	7.5	
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 20A		25		S
<b>DYNAMIC</b>						
Input Capacitance <sup>5</sup>	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 50V, f = 1MHz		3421		pF
Output Capacitance <sup>5</sup>	C <sub>oss</sub>			620		
Reverse Transfer Capacitance <sup>5</sup>	C <sub>rss</sub>			30		
Gate Resistance <sup>4,5</sup>	R <sub>g</sub>	f = 1MHz		0.7		Ω
Total Gate Charge <sup>1,2,5</sup>	Q <sub>g</sub> (V <sub>GS</sub> =10V)	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A		52.4		nC
	Q <sub>g</sub> (V <sub>GS</sub> =4.5V)			28.1		
Gate-Source Charge <sup>1,2,5</sup>	Q <sub>gs</sub>			9.4		
Gate-Drain Charge <sup>1,2,5</sup>	Q <sub>gd</sub>			11.5		
Turn-On Delay Time <sup>1,2,5</sup>	t <sub>d(on)</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 5A, R <sub>g</sub> = 6Ω		11.5		nS
Rise Time <sup>1,2,5</sup>	t <sub>r</sub>			7.2		
Turn-Off Delay Time <sup>1,2,5</sup>	t <sub>d(off)</sub>			27.0		
Fall Time <sup>1,2,5</sup>	t <sub>f</sub>			36.3		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Continuous Current	I <sub>S</sub>				122	A
Pulsed Current <sup>3</sup>	I <sub>SM</sub>				196	
Forward Voltage <sup>1,4</sup>	V <sub>SD</sub>	I <sub>F</sub> = 30A, V <sub>GS</sub> = 0V			1.2	V
Reverse Recovery Time <sup>5</sup>	t <sub>rr</sub>	I <sub>F</sub> = 30A, dI <sub>F</sub> /dt = 100A / uS		66.1		nS
Peak Reverse Recovery Current <sup>5</sup>	I <sub>RM(REC)</sub>			2.39		A
Reverse Recovery Charge <sup>5</sup>	Q <sub>rr</sub>			89.3		nC

<sup>1</sup>Pulse test : Pulse Width ≤ 300 usec, Duty Cycle ≤ 2%.

<sup>2</sup>Independent of operating temperature.

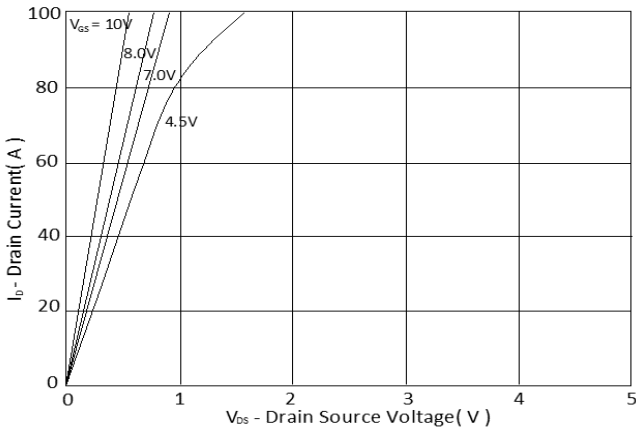
<sup>3</sup>Pulse width limited by maximum junction temperature.

<sup>4</sup>Guarantee by FT test Item

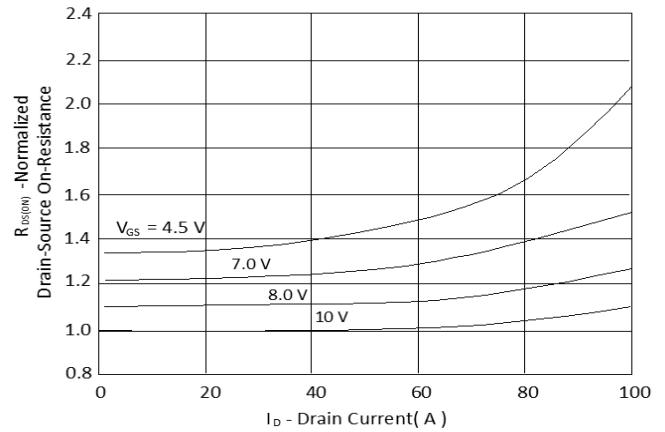
<sup>5</sup>Guarantee by Engineering test

**EMC will review datasheet by quarter, and update new version.**

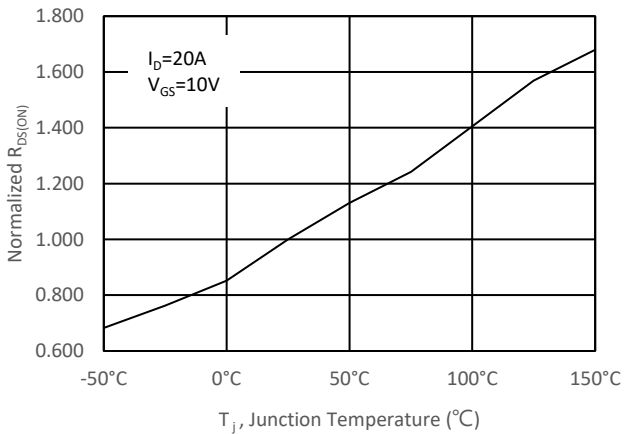
▪ TYPICAL CHARACTERISTICS



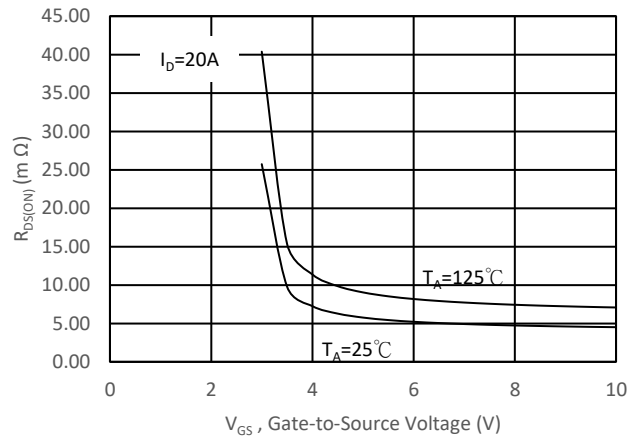
**Fig.1 Typical Output Characteristics**



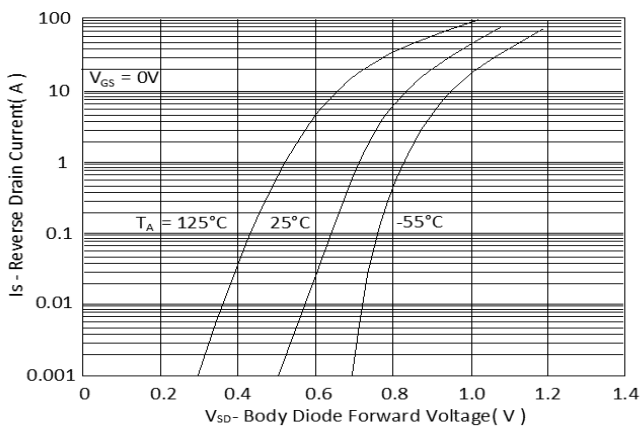
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



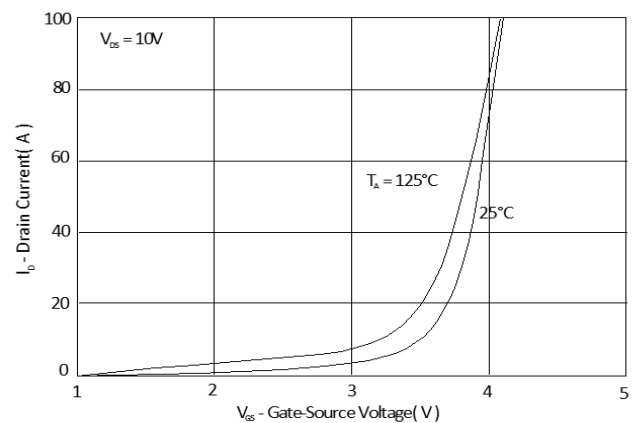
**Fig.3 Normalized On-Resistance v.s. Junction Temperature**



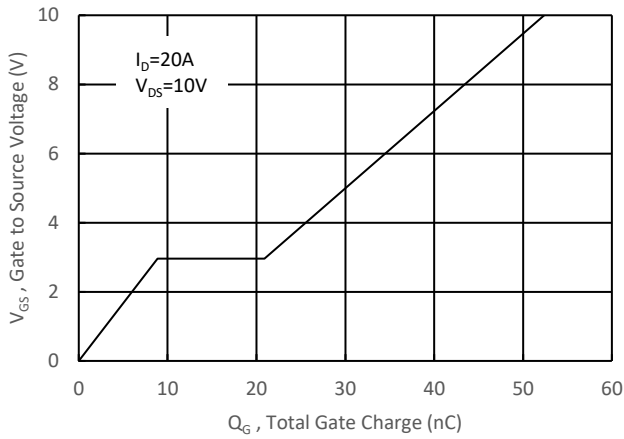
**Fig.4 On-Resistance v.s. Gate Voltage**



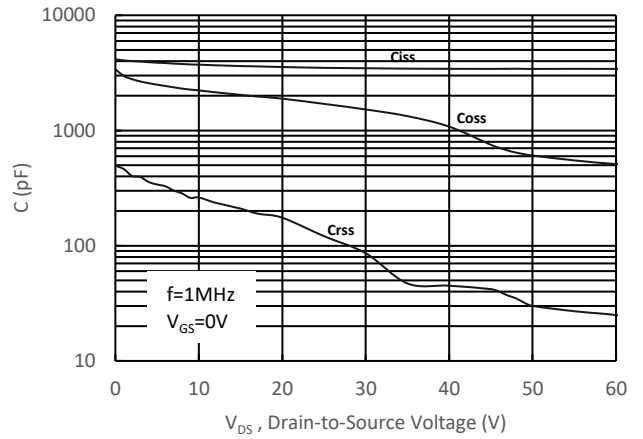
**Fig.5 Forward Characteristic of Reverse Diode**



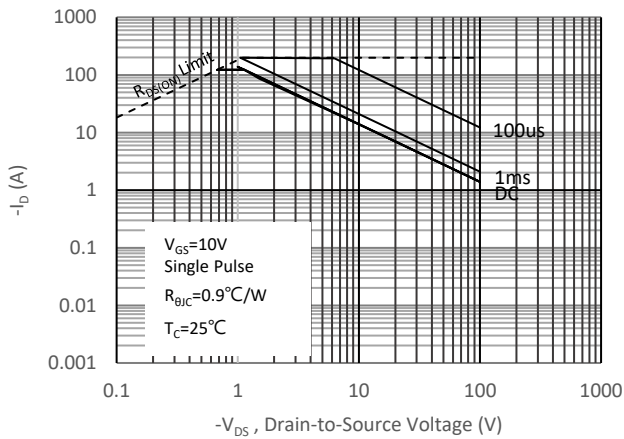
**Fig.6 Transfer Characteristics**



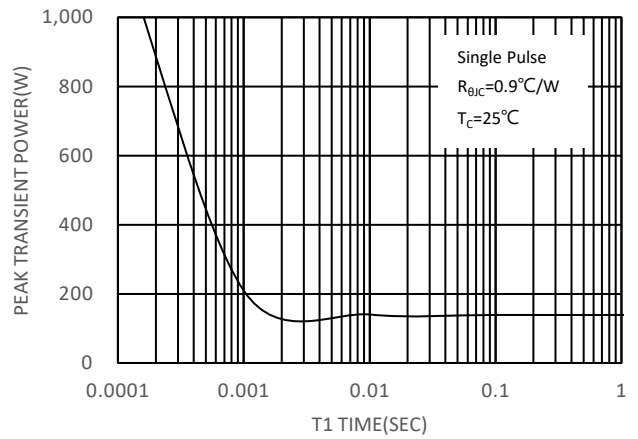
**Fig.7 Gate Charge Characteristics**



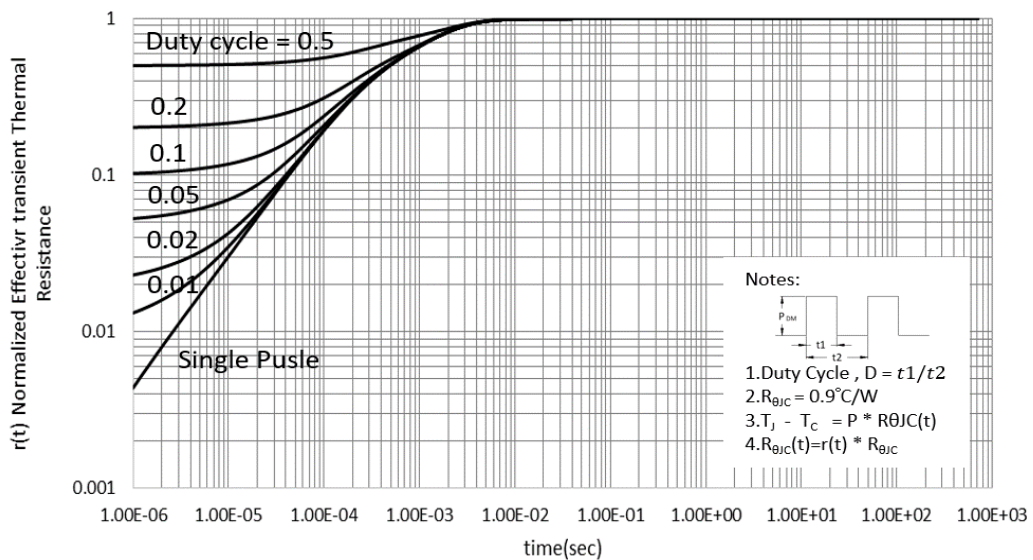
**Fig.8 Typical Capacitance Characteristics**



**Fig 9. Maximum Safe Operating Area**



**Fig 10. Single Pulse Maximum Power Dissipation**



**Fig 11. Effective Transient Thermal Impedance**

**Ordering & Marking Information:**

Device Name: EMB05N10H for EDFN 5x6



B05N10: Device Name

ABCDEFG: Date Code

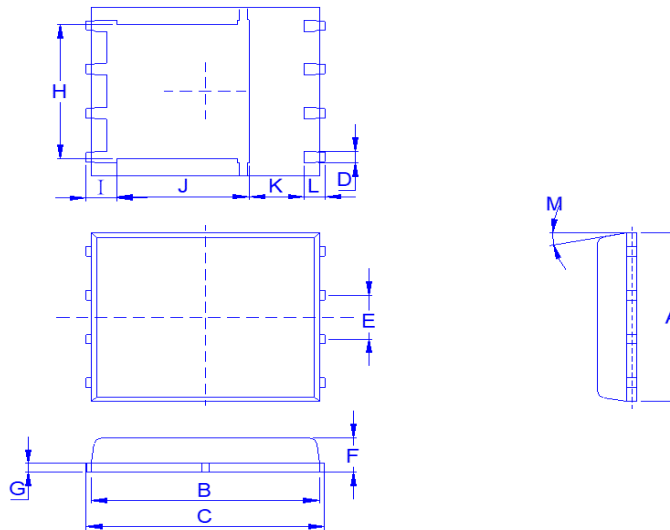
A: Assembly House

B: Year(A:2008 B:2009 C:2010....)

C: Month(A:01 B:02 C:03 D:04 E:05 F:06 G:07 H:08 I:09 J:10 K:11 L:12)

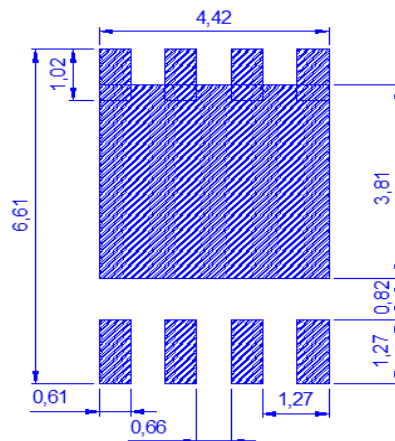
DEFG: Serial No.

**Outline Drawing**

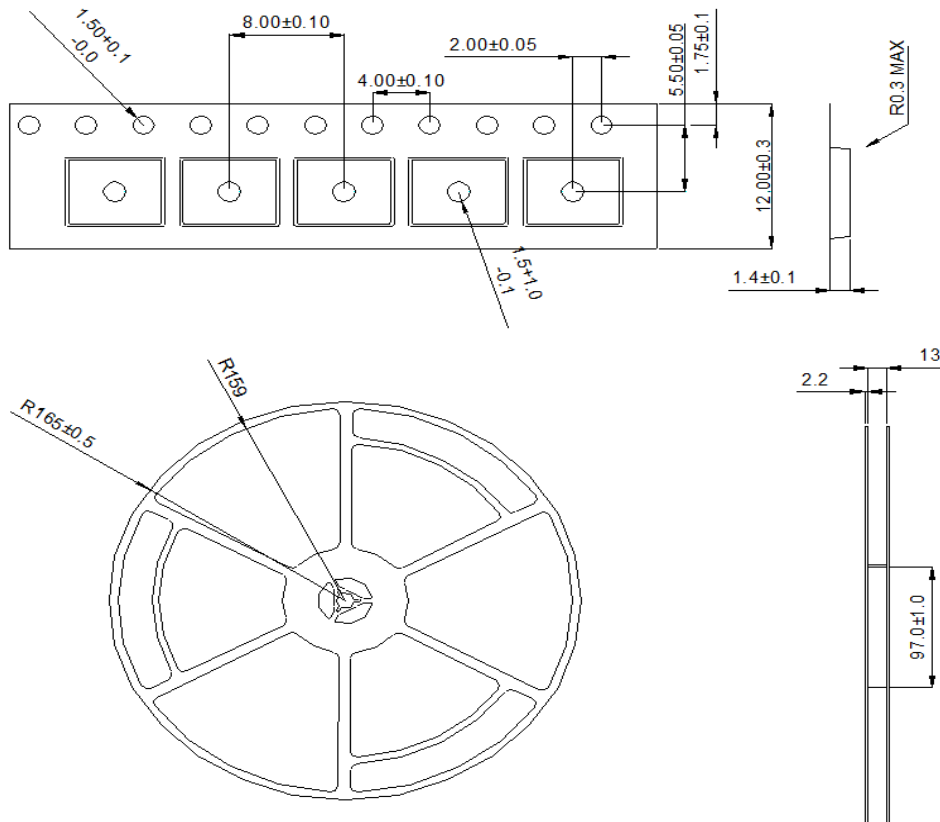


Dimension	A	B	C	D	E	F	G	H	I	J	K	L	M
Min.	4.8	5.55	5.9	0.3	1.17	0.85	0.15	3.61	0.38	3.18	1	0.38	0°
Typ.	4.9	5.7	6	0.4	1.27	0.95	0.2	3.87	0.4	3.44	1.2	0.4	
Max.	5.4	5.85	6.15	0.51	1.37	1.17	0.34	4.31	0.71	3.78	1.39	0.71	12°

**Footprint**



◆ **Tape&Reel Information:2500pcs/Reel**  
 (Dimension in millimeter)



產品別	EDFN 5x6
Reel尺寸	13"
編帶方式	FEED DIRECTION 
前空格	25
後空格	50
裝箱數	
滿捲數量	2.5K
捲/內盒比	01:01
內盒滿箱數	2.5K
內/外箱比	10:01
外箱滿箱數	25K



★Datasheet Latest version specification :

	Revision History	Prepared	Approved	Date
A.0	Initial Datasheet	Johnson	Sam	2020/7/22
A.1	Update electrical specifications	Johnson	Sam	2020/8/4