

### Product Summary

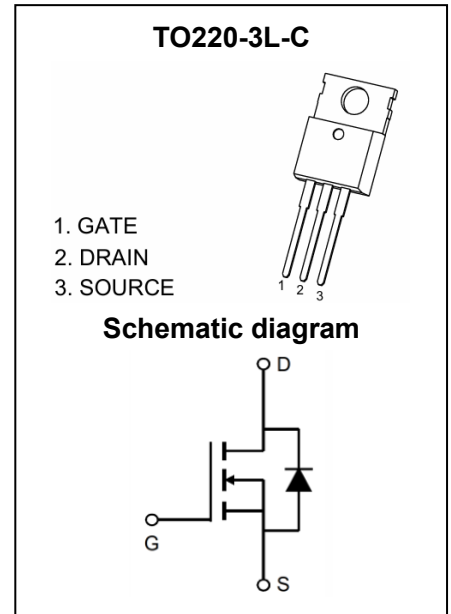
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
70V	4.8mΩ@10V	140A

### Feature

- Split Gate Trench Technology
- Low  $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

### Application

- Power Management
- Motor Driving
- High frequency switching, synchronous rectification



### Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPT050N07NTB	TO-220-3L-C	T050N07N	Tube	NA	NA	50pcs

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	70	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current <sup>1</sup>	$I_D$	$T_C = 25^\circ\text{C}$	140
		$T_C = 100^\circ\text{C}$	88
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	560	A
Single Pulsed Avalanche Current <sup>3</sup>	$I_{AS}$	28	A
Single Pulsed Avalanche Energy <sup>3</sup>	$E_{AS}$	196	mJ
Power Dissipation <sup>5</sup>	$P_D$	166.6	W
Thermal Resistance from Junction to Ambient <sup>6</sup>	$R_{\theta JA}$	32	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.75	$^\circ\text{C/W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

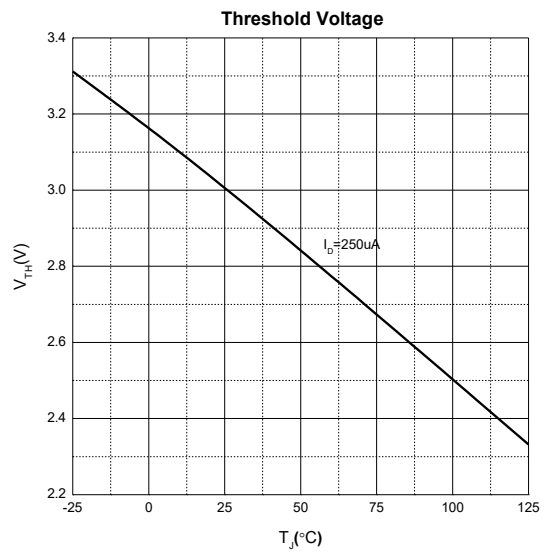
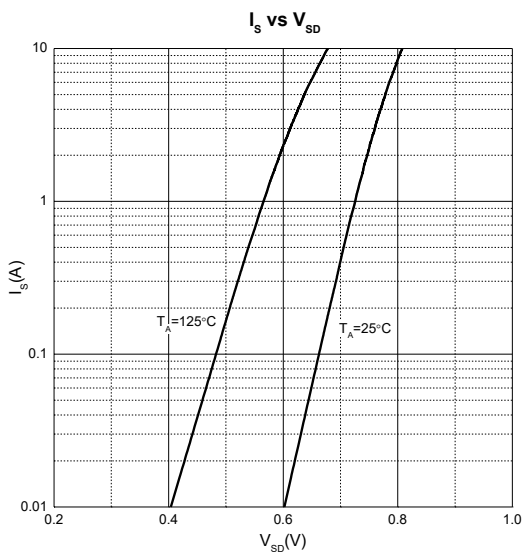
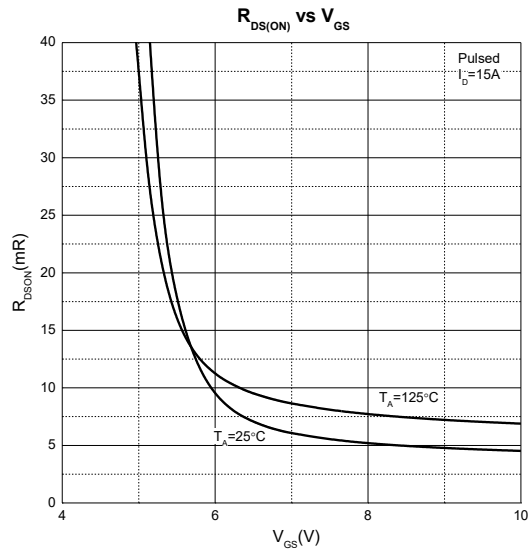
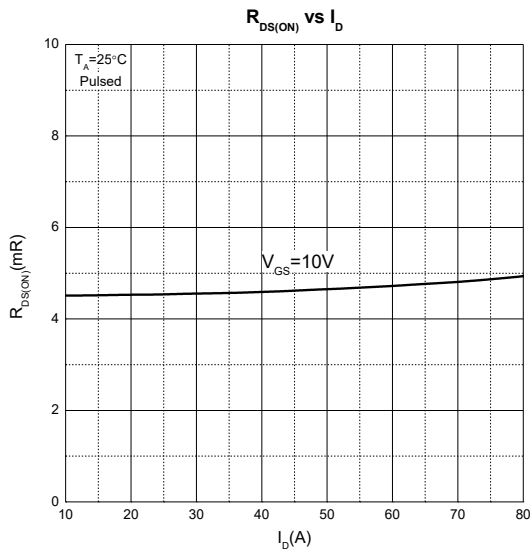
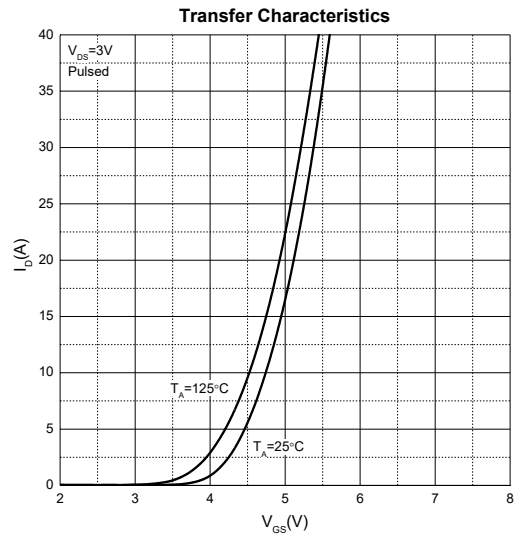
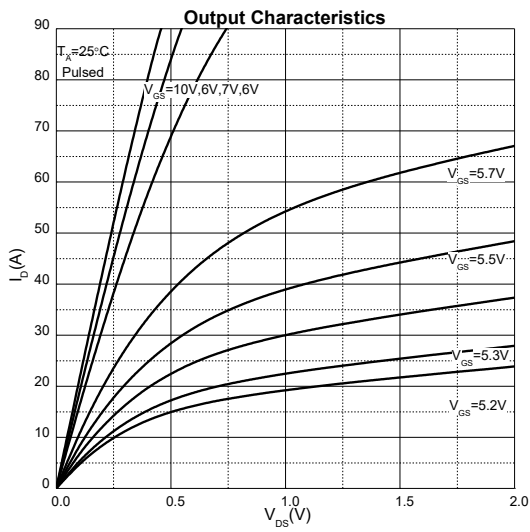
## MOSFET ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

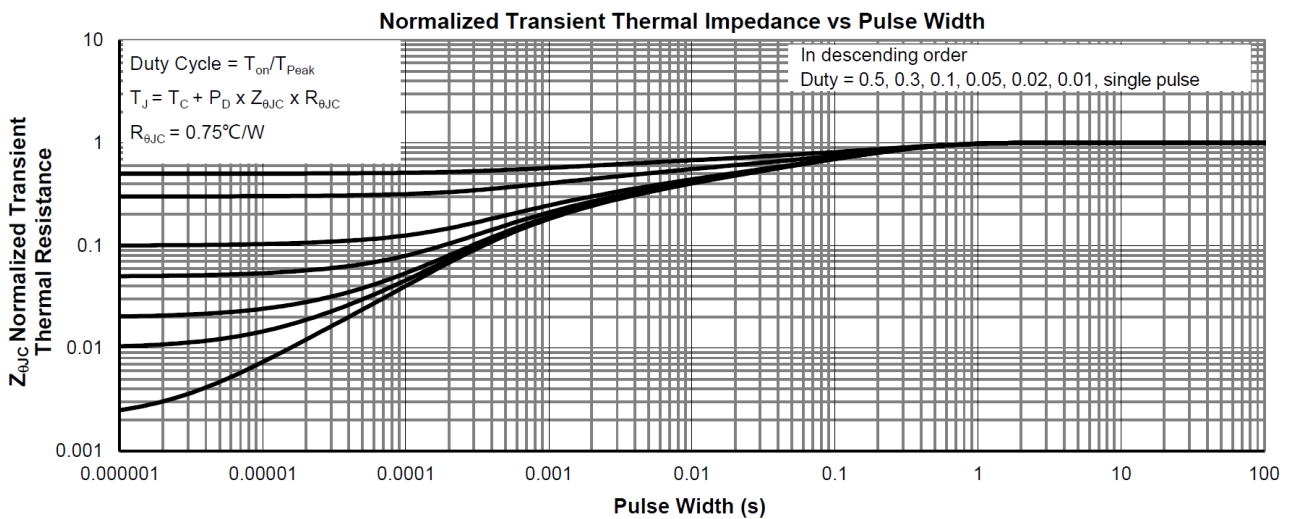
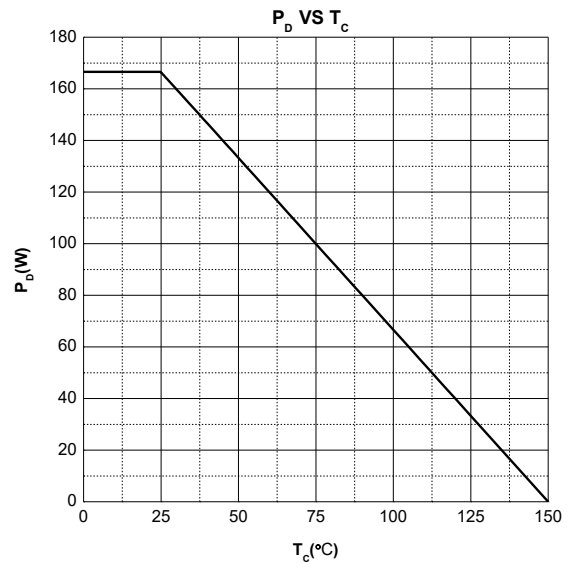
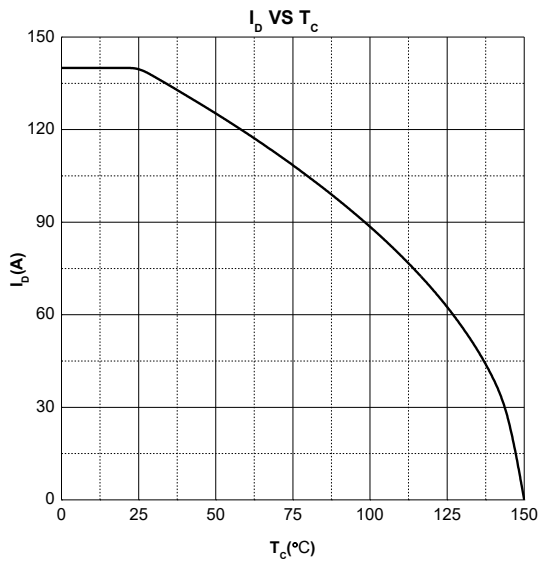
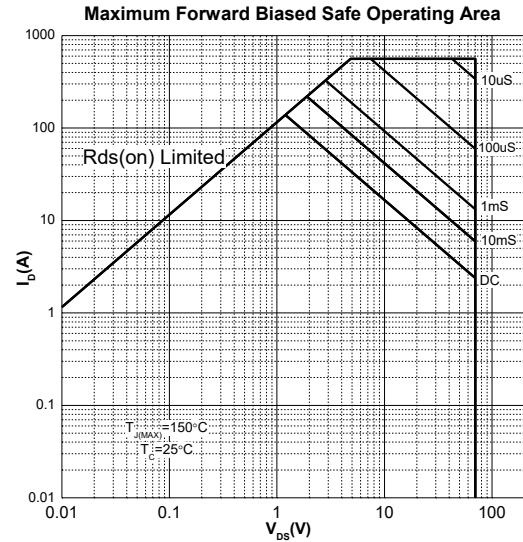
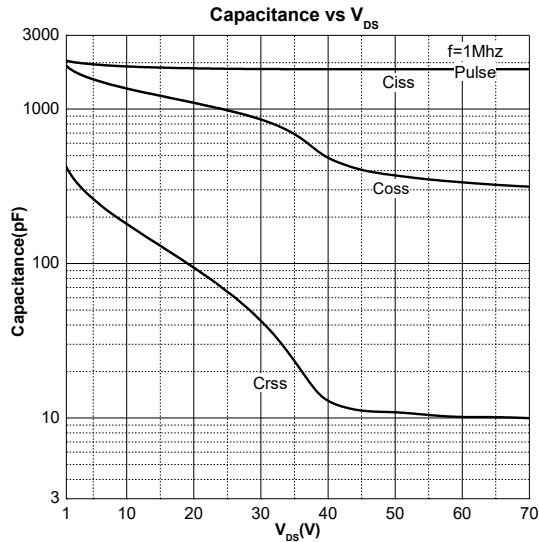
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	70			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 70V, V_{GS} = 0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
<b>On Characteristics<sup>4</sup></b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.0	4.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		4.8	6.3	m $\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 35V, V_{GS} = 0V, f = 1MHz$		1812		pF
Output Capacitance	$C_{oss}$			650		
Reverse Transfer Capacitance	$C_{rss}$			20		
Gate Resistance	$R_g$	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		2.4		$\Omega$
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 35V, V_{GS} = 10V, I_D = 20A$		30		nC
Gate-Source Charge	$Q_{gs}$			8.9		
Gate-Drain Charge	$Q_{gd}$			8.9		
Gate Plateau Voltage	$V_{plateau}$			4.9		V
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 35V, V_{GS} = 10V, R_G = 3\Omega, R_L = 2.5\Omega$		5		ns
Turn-On Rise Time	$t_r$			10		
Turn-Off Delay Time	$t_{d(off)}$			25		
Turn-Off Fall Time	$t_f$			15		
<b>Source-Drain Diode Characteristics</b>						
Diode Forward Voltage <sup>4</sup>	$V_{SD}$	$V_{GS} = 0V, I_S = 2A$		0.75	1.2	V
Diode Continuous Forward Current <sup>1</sup>	$I_S$	$T_C = 25^\circ\text{C}$			140	A
Diode Pulse Forward Current <sup>2</sup>	$I_{SM}$	$T_C = 25^\circ\text{C}$			560	A
Diode Reverse Recovery Time	$t_{rr}$	$I_F = 20A, di/dt = 100A/\mu s$		35		ns
Diode Reverse Recovery Charge	$Q_{rr}$	$I_F = 20A, di/dt = 100A/\mu s$		40		nC

### Notes:

1. The maximum current rating is limited by package. And device mounted on a large heatsink.
2. Pulse Test: Pulse Width  $\leq 10\mu s$ , duty cycle  $\leq 1\%$ .
3. EAS condition:  $V_{DD} = 35V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$  Starting  $T_J = 25^\circ\text{C}$ .
4. Pulse Test: Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
5. The power dissipation  $P_D$  is limited by  $T_{J(MAX)} = 150^\circ\text{C}$ . And device mounted on a large heatsink.
6. Device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .

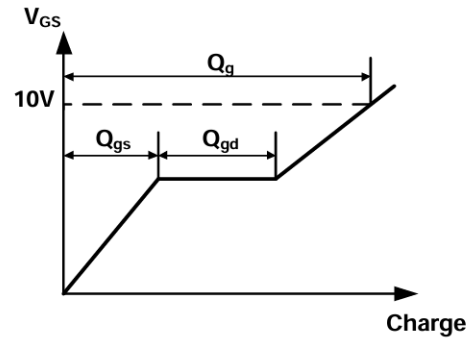
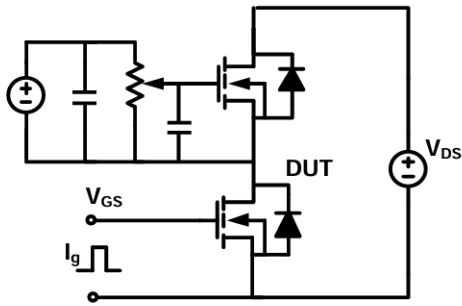
**Typical Characteristics**



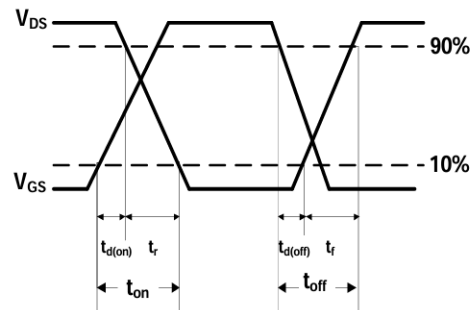
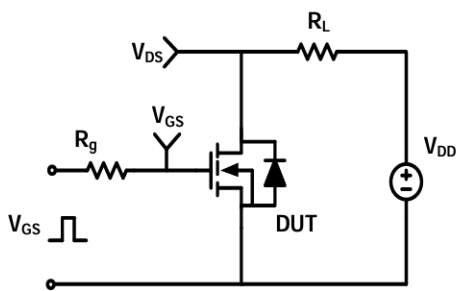


**Test Circuit**

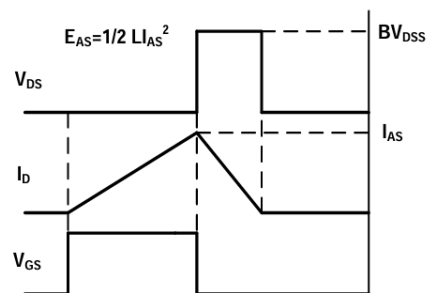
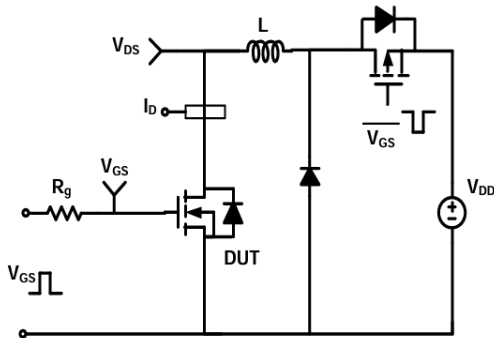
**Gate Charge Test Circuit & Waveform**



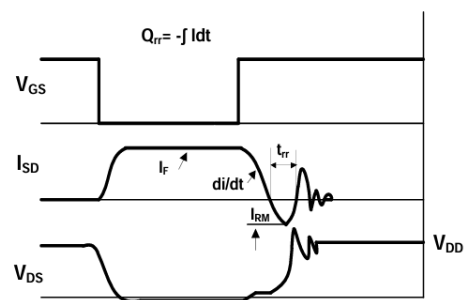
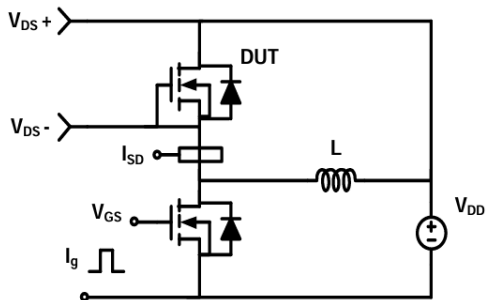
**Resistive Switching Test Circuit & Waveform**



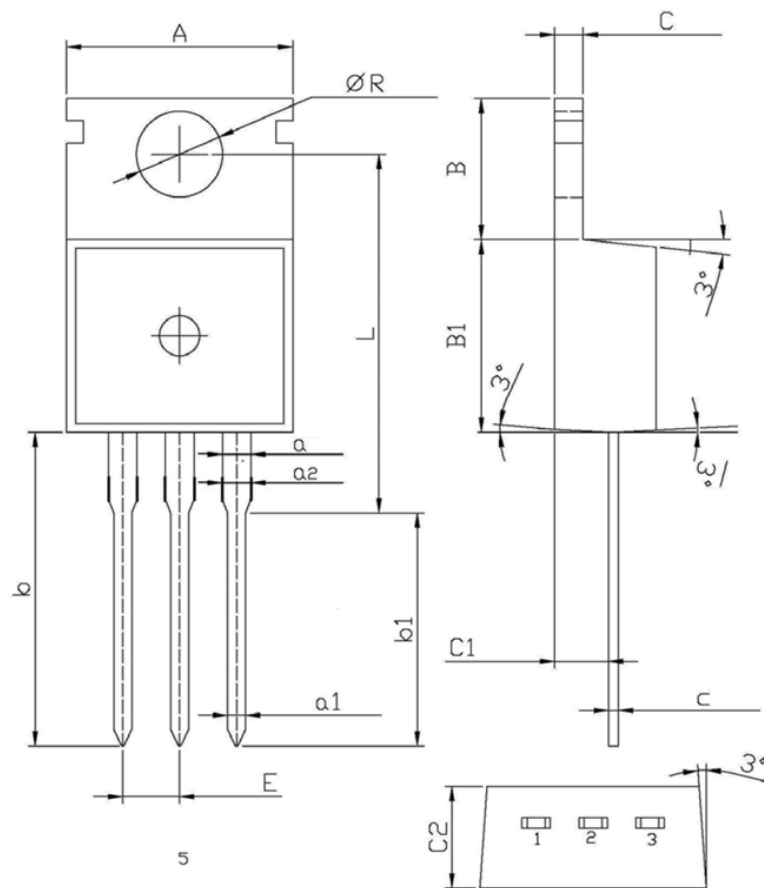
**Unclamped Inductive Switching (UIS) Test Circuit & Waveform**



**Diode Recovery Test Circuit & Waveform**



## TO220-3L-C Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	9.800	10.200	0.386	0.402
R	3.560	3.640	0.140	0.143
L	15.700	16.100	0.618	0.634
b	12.600	13.600	0.496	0.535
b1	9.600	10.600	0.378	0.417
a	1.220	1.320	0.048	0.052
E	2.340	2.740	0.092	0.108
a2	1.250	1.620	0.049	0.064
C	1.200	1.400	0.047	0.055
B	5.900	6.700	0.232	0.264
B1	9.000	9.400	0.354	0.370
C1	2.200	2.600	0.087	0.102
a1	0.700	0.900	0.028	0.035
c	0.400	0.600	0.016	0.024
C2	4.300	4.700	0.169	0.185

**Attention:**

- GreenPower Electronics reserves the right to improve product design function and reliability without notice.
- Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.
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