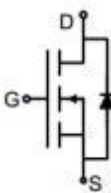
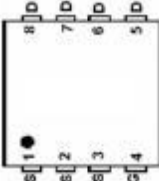



# N-Channel Enhancement Mode Power MOSFET

<p><b>Description</b></p> <p>The G50N03D5 uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>, low gate charge. It can be used in a wide variety of applications.</p> <p><b>General Features</b></p> <ul style="list-style-type: none"> <li>● <math>V_{DS}</math> 30V</li> <li>● <math>I_D</math> (at <math>V_{GS} = 10V</math>) 50A</li> <li>● <math>R_{DS(ON)}</math> (at <math>V_{GS} = 10V</math>) &lt; 4.5mQ</li> <li>● <math>R_{DS(ON)}</math> (at <math>V_{GS} = 4.5V</math>) &lt; 8mQ</li> <li>● 100% Avalanche Tested</li> <li>● RoHS Compliant</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>● Power switch</li> <li>● DC/DC converters</li> </ul>		 <p>Schematic diagram</p>  <p>Marking and pin assignment</p>  <p>DFN5*6-8L</p>	
<b>Device</b>	<b>Package</b>	<b>Marking</b>	<b>Packaging</b>
G50N03D5	DFN5*6-8L	G50N03	5000 pcs/Reel

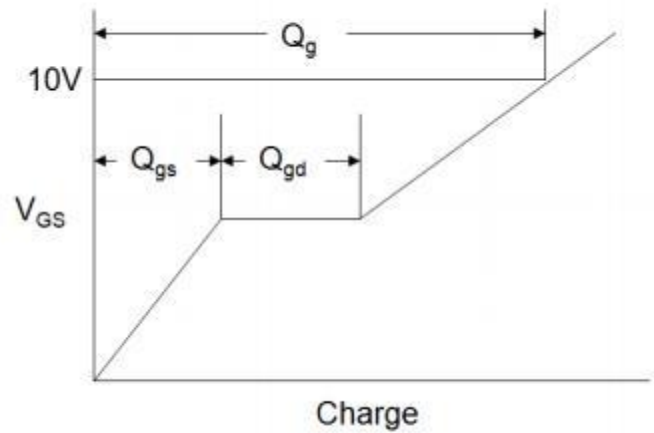
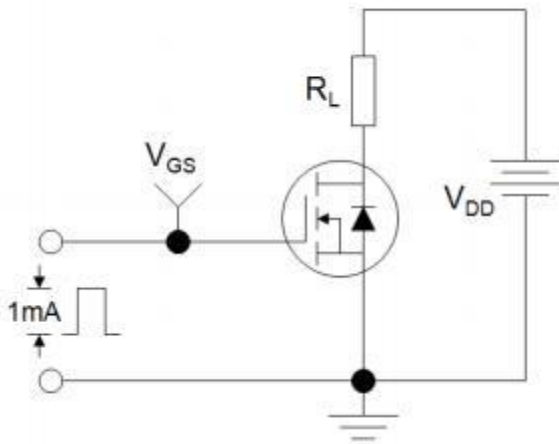
<b>Absolute Maximum Ratings</b> $T_C = 25^\circ C$ , unless otherwise noted			
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Continuous Drain Current	$I_D$	50	A
Pulsed Drain Current (note1)	$I_{DM}$	200	A
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Power Dissipation	$P_D$	20	W
Single pulse avalanche energy (note2)	$E_{AS}$	81	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 To 150	$^\circ C$
<b>Thermal Resistance</b>			
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	78	$^\circ C/W$
Thermal Resistance, Junction-to-Case	$R_{thJC}$	6	$^\circ C/W$

<b>Specifications</b> $T_J = 25^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	30	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	1	$\mu\text{A}$
Gate-Source Leakage	$I_{GSS}$	$V_{GS} = \pm 20V$	--	--	$\pm 100$	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.1	1.6	2.4	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	--	3.2	4.5	m $\Omega$
		$V_{GS} = 4.5V, I_D = 20A$	--	5.9	8	
Forward Transconductance	$g_{FS}$	$V_{DS} = 5V, I_D = 20A$	--	35	--	S
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = 15V,$ $f = 1.0\text{MHz}$	--	1661	--	pF
Output Capacitance	$C_{oss}$		--	338	--	
Reverse Transfer Capacitance	$C_{rss}$		--	316	--	
Total Gate Charge	$Q_g$	$V_{DD} = 15V,$ $I_D = 20A,$ $V_{GS} = 10V$	--	38.4	--	nC
Gate-Source Charge	$Q_{gs}$		--	5.8	--	
Gate-Drain Charge	$Q_{gd}$		--	7.9	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 5V,$ $I_D = 20A,$ $R_G = 6\Omega$	--	7	--	ns
Turn-on Rise Time	$t_r$		--	6	--	
Turn-off Delay Time	$t_{d(off)}$		--	30	--	
Turn-off Fall Time	$t_f$		--	8	--	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C = 25^\circ\text{C}$	--	--	50	A
Body Diode Voltage	$V_{SD}$	$T_J = 25^\circ\text{C}, I_{SD} = 20A, V_{GS} = 0V$	--	--	1.2	V
Reverse Recovery Charge	$Q_{rr}$	$I_F = 20A, V_{GS} = 0V$ $di/dt = 500A/\mu\text{s}$	--	57	--	nC
Reverse Recovery Time	$T_{rr}$		--	21	--	ns

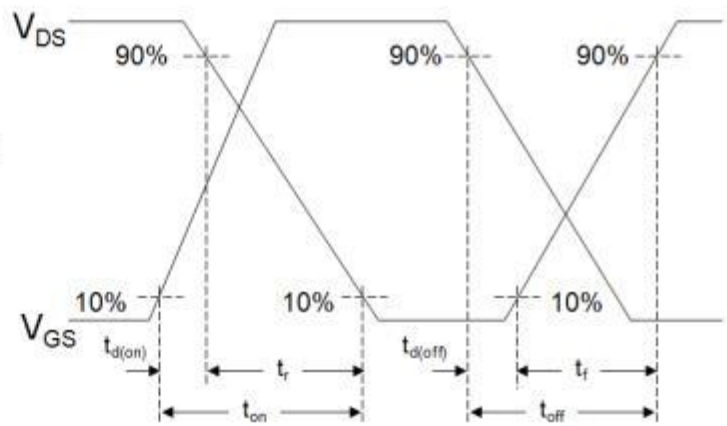
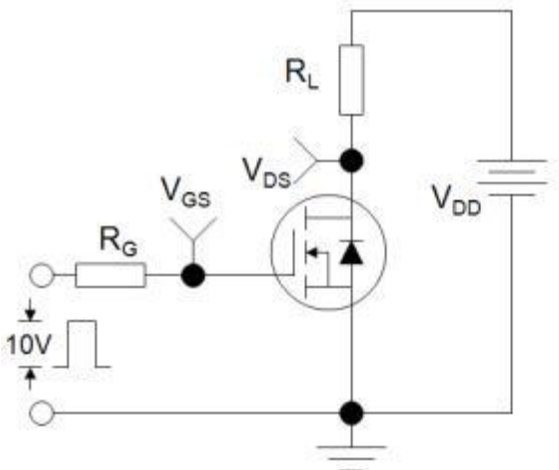
**Notes**

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical  $R_G$

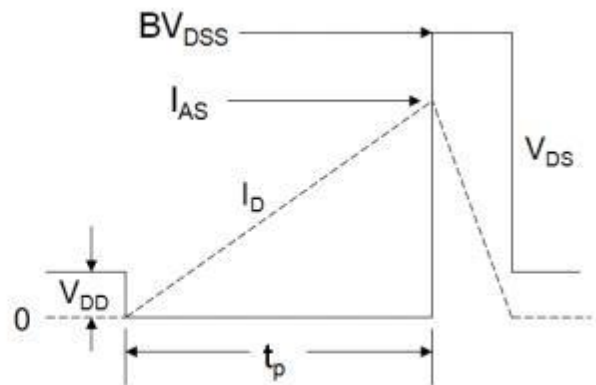
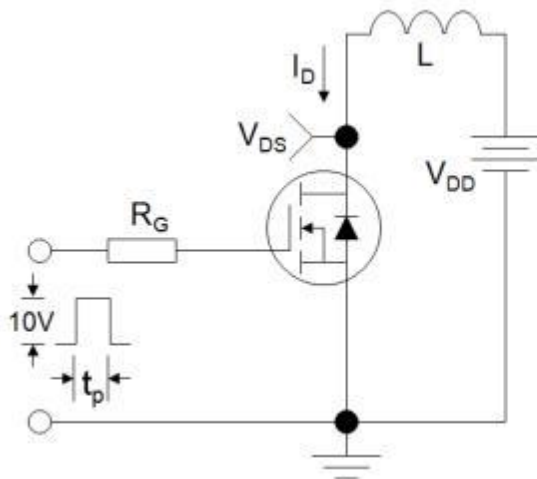
**Gate Charge Test Circuit**



**Switch Time Test Circuit**

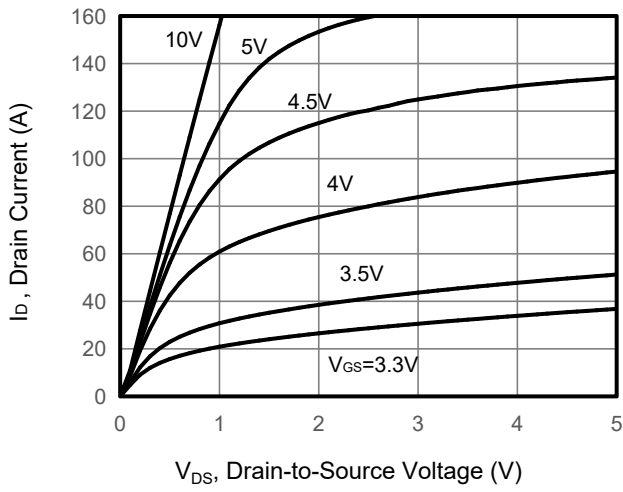


**EAS Test Circuit**

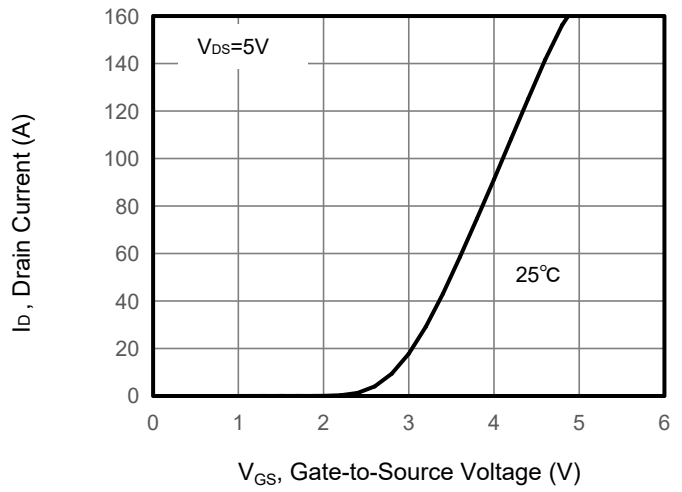


**Typical Characteristics**  $T_J = 25^\circ\text{C}$ , unless otherwise noted

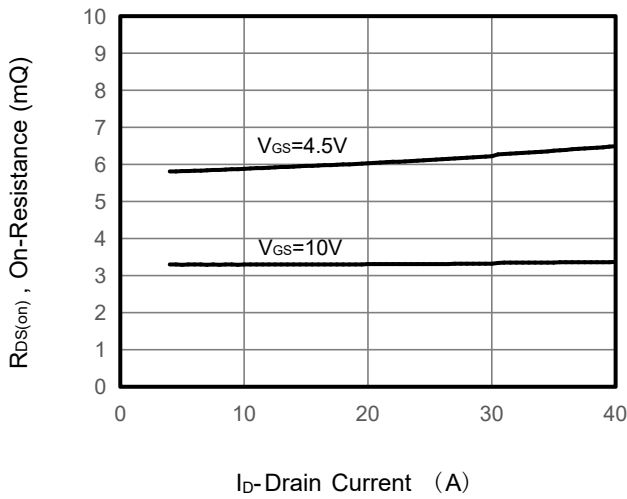
**Figure 1. Output Characteristics**



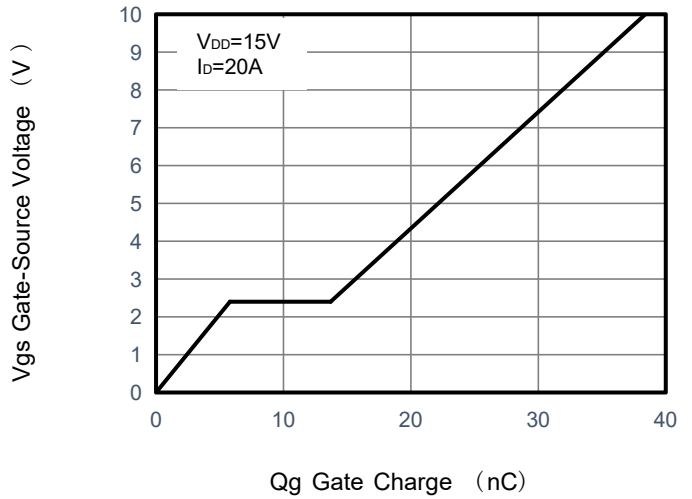
**Figure 2. Transfer Characteristics**



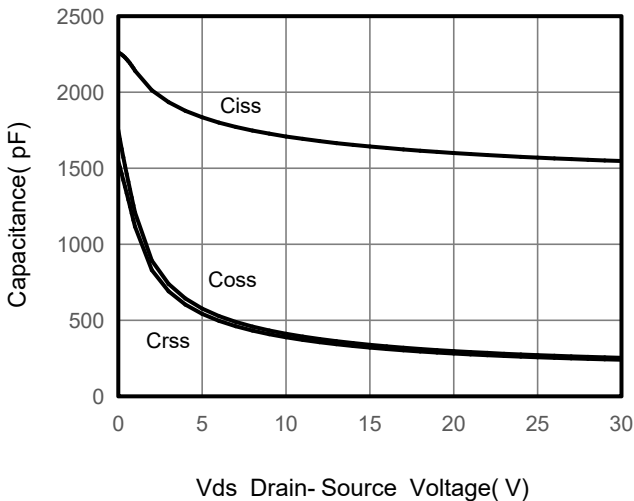
**Figure 3. Drain Source On Resistance**



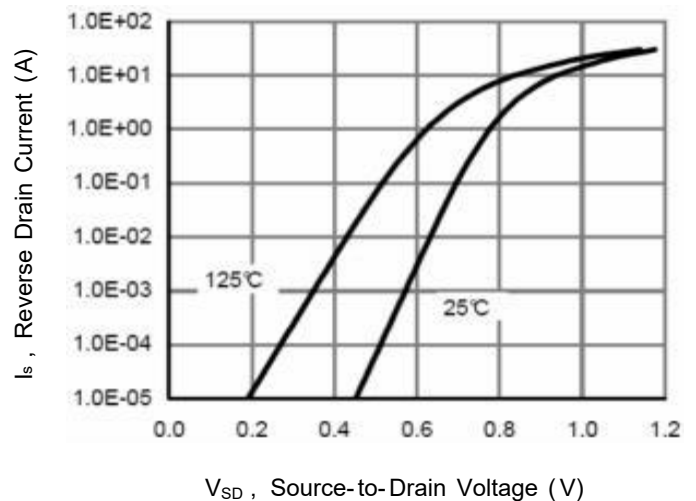
**Figure 4. Gate Charge**



**Figure 5. Capacitance**

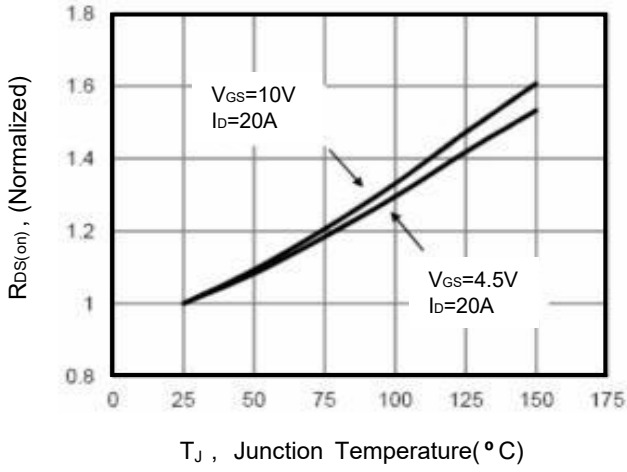


**Figure 6. Source-Drain Diode Forward**

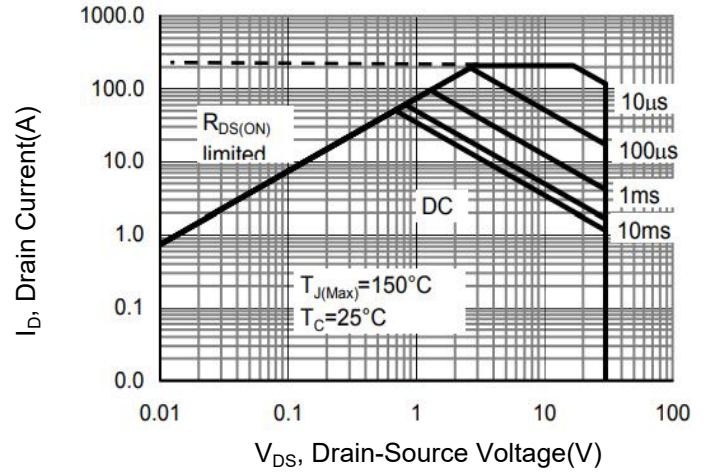


**Typical Characteristics**  $T_J = 25^\circ\text{C}$ , unless otherwise noted

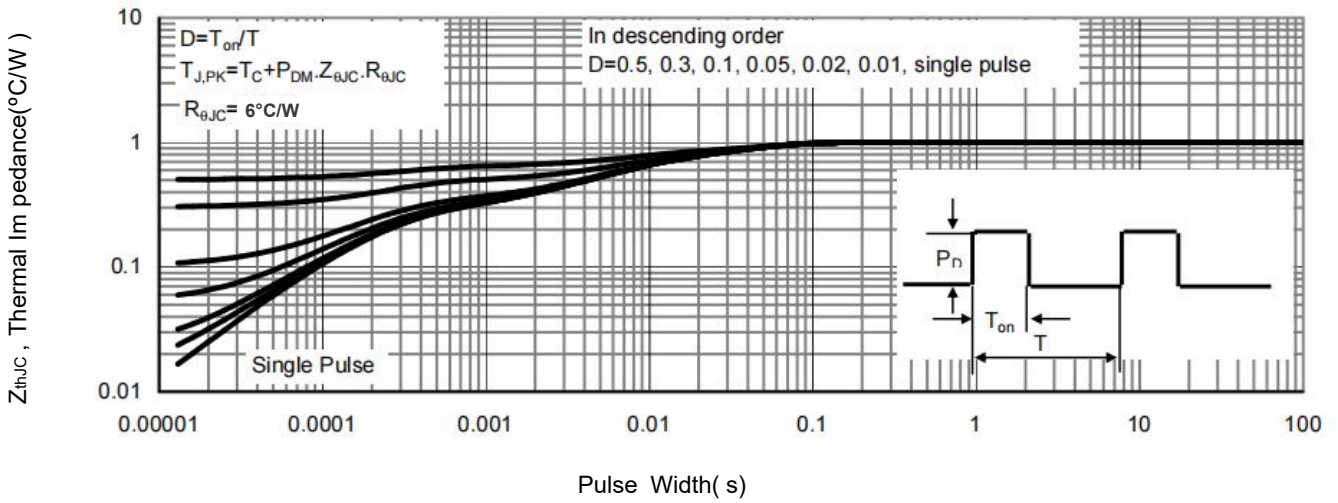
**Figure 7. Drain-Source On-Resistance**



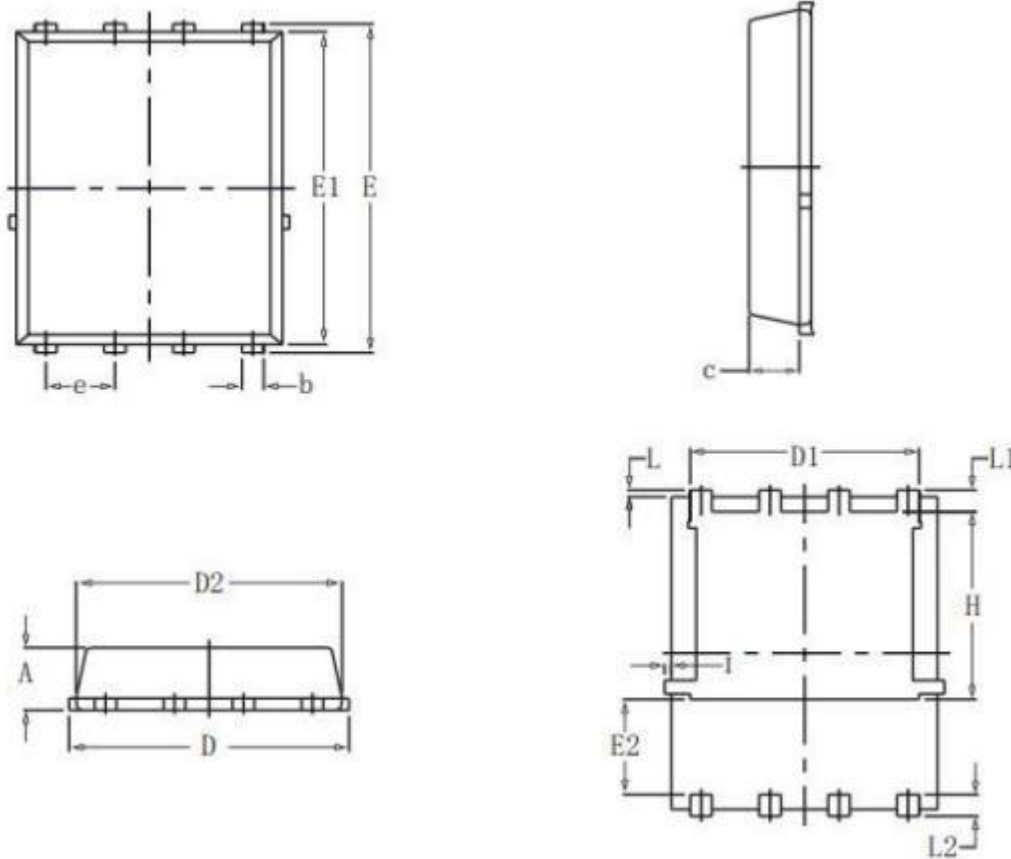
**Figure 8. Safe Operation Area**



**Figure 9. Normalized Maximum Transient Thermal Impedance**



**DFN5×6-8L Package Information**



SYMBOL	COMMON			
	MM		INCH	
	MIN	MAX	MIN	MAX
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.59	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	-	0.0630	-
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	-	0.18	-	0.0070

编制	杭佳敏	审核	周叶 孙奕
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**Revision Information**

No.	Date	Version	Change Notice
1	2022.7.8	V1.0	A1398