• General Description

The ZM045N03N combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

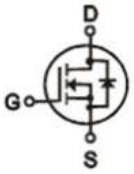
• Features

- ■ Advance high cell density Trench technology
- ■Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■Low Thermal resistance

•Application

- ■MB/VGA Vcore
- ■Synchronous Rectifier
- ■BLDC Motor driver

• Product Summary

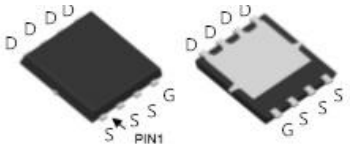


V_{DS} =30V

$R_{DS(ON)}$ =4.5mΩ

I D =75A

RoHS



DFN5 x 6

•Ordering Information:

Part NO.	ZM045N03N
Marking	ZM045N03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

•Absolute Maximum Ratings (T_C =25℃)

Parameter	**Symbol**	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D@T_C=25℃	75	A
	I_D@T_C=75℃	57	A
	I_D @T_C=100℃	47	A
Pulsed Drain Current ①	I_{DM}	180	A
Total Power Dissipation	P_D@T_C=25℃	80	W
Total Power Dissipation	P_D@T_A=25℃	2.5	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	100	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	1.6	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	50	°C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	°C

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =250uA	30			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =250uA	1.2		2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS} =0V			1.0	uA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS} =0V			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		4.5	5.6	mΩ
		V_{GS}=4.5V, I_D=10A		7.0	9.0	mΩ
Forward Transconductance	g_{FS}	V_{DS} =10V, I_D=10A		7		s
Source-drain voltage	V_{SD}	Is=20A		0.8	1.28	V

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz	-	1500	-	pF
Output capacitance	Coss		-	280	-	
Reverse transfer capacitance	Crss		-	140	-	
Total gate charge	Qg	V_{DD} = 25V I_D = 8A V_{GS} = 10V	-	31	-	nC
Gate - Source charge	Qgs		-	4.3	-	
Gate - Drain charge	Qgd		-	8.7	-	
Turn-ON Delay time	$t_{D(on)}$	V_{GS}=10V ,V_{DS}=15V R_G =3.3Ω, I_D =15A		7.5		ns
Turn-ON Rise time	t_r			14		ns
Turn-Off Delay time	$t_{D(off)}$			35		ns
Turn-Off Fall time	t_f			10		ns
Reverse Recovery Time	Trr	Isd=20A,VGS=0V di/dt=100A/μs		19		ns
Reverse Recovery Charge	Qrr			5.4		nC

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

Fig.1 Power Dissipation

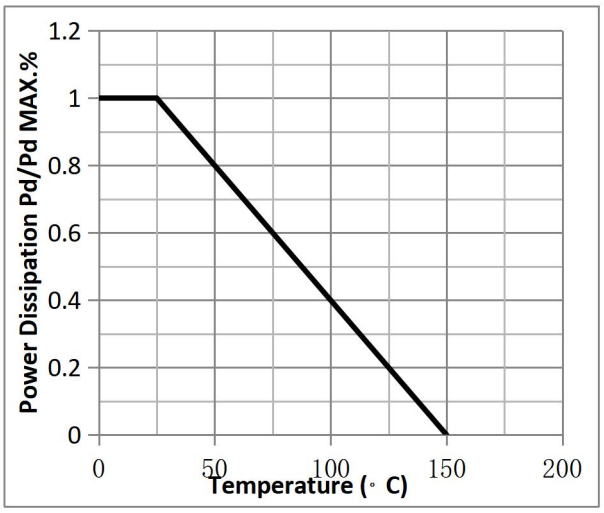


Fig.2 Typical output Characteristics

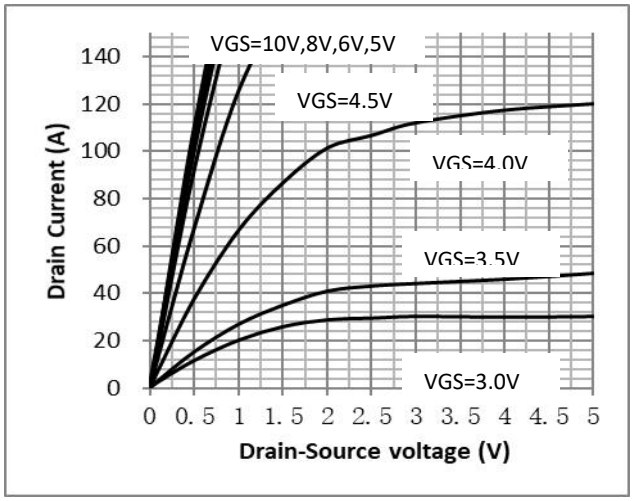


Fig.3 Threshold Voltage V.S Junction Temperature

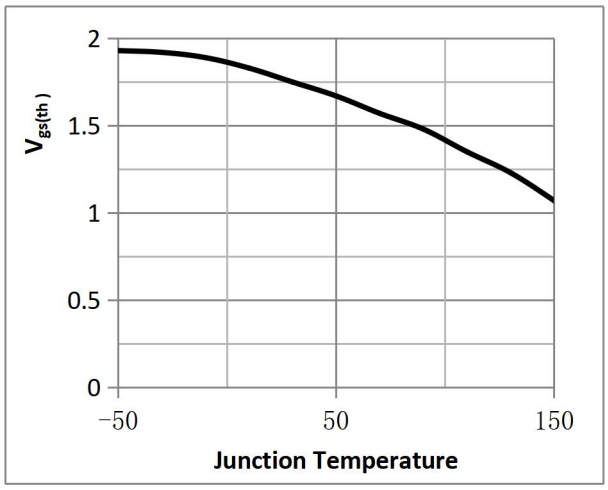


Fig.4 Resistance V.S Drain Current

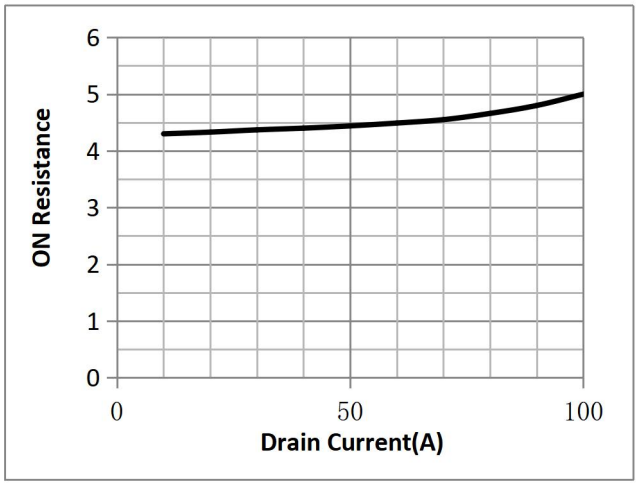


Fig.5 On-Resistance VS Gate Source Voltage

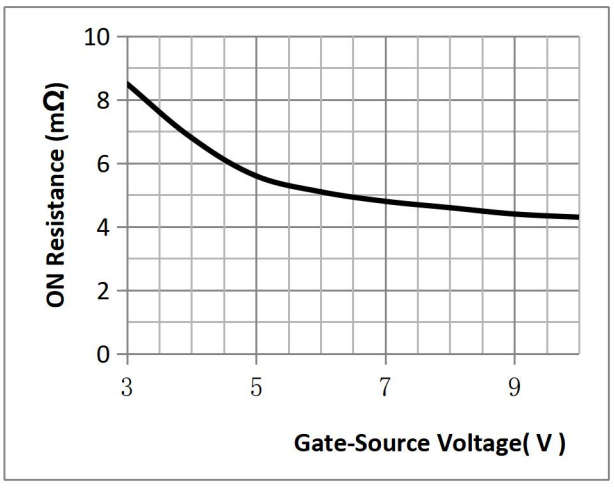


Fig.6 On-Resistance V.S Junction Temperature

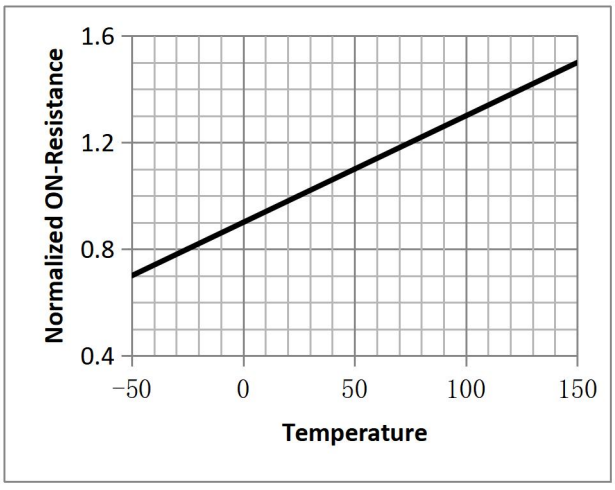


Figure 7. Gate−to−Source and Drain−to−Source Voltage vs. Total Charge

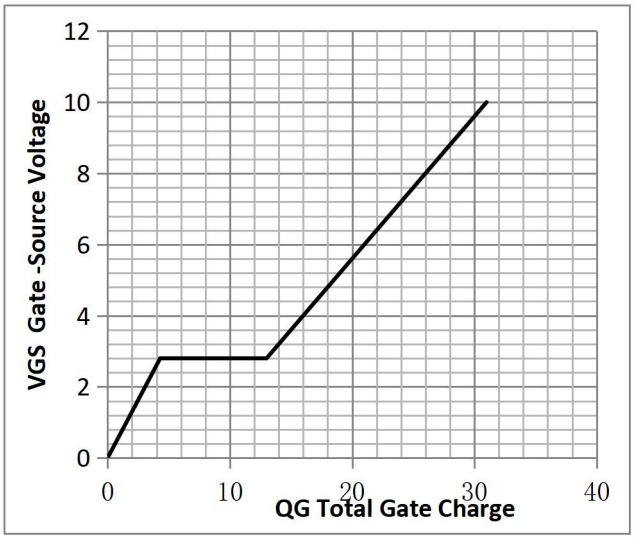


Fig.8 Capacitance Variation

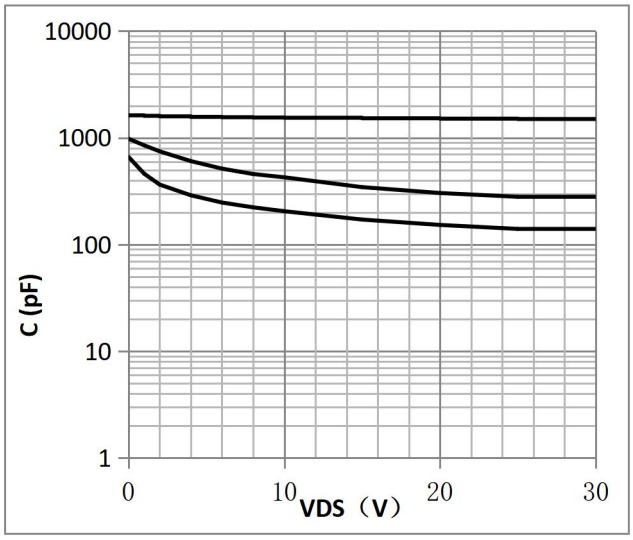


Figure 9. Diode Forward Voltage vs. Current

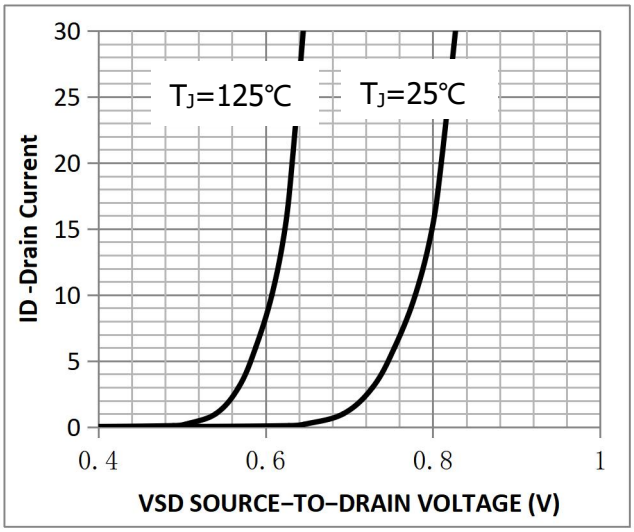


Figure 10. Transfer Characteristics

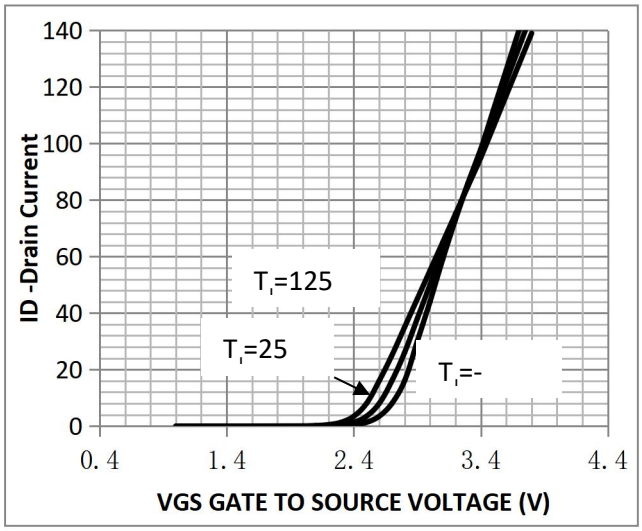


Fig.11 SOA Maximum Safe Operating Area

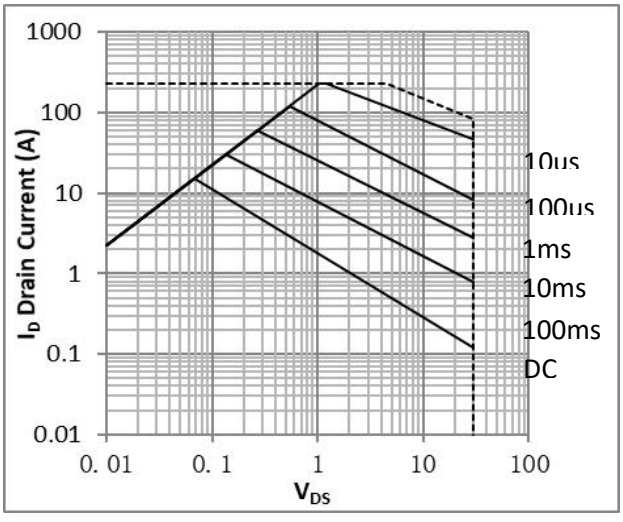


Fig.12 ID-Junction Temperature

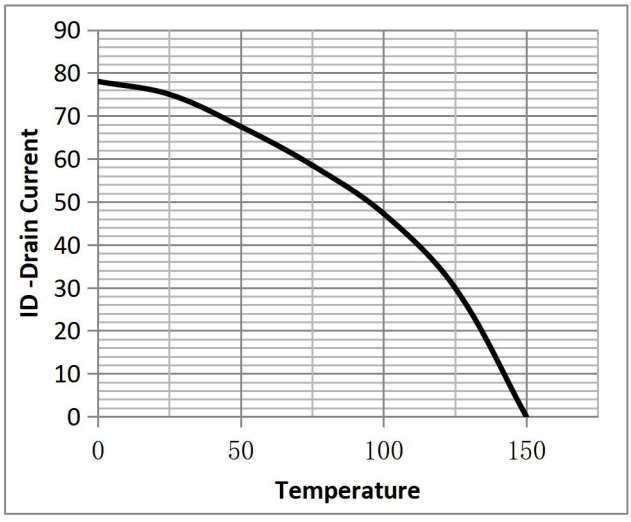


Fig.13 Switching Time Measurement Circuit

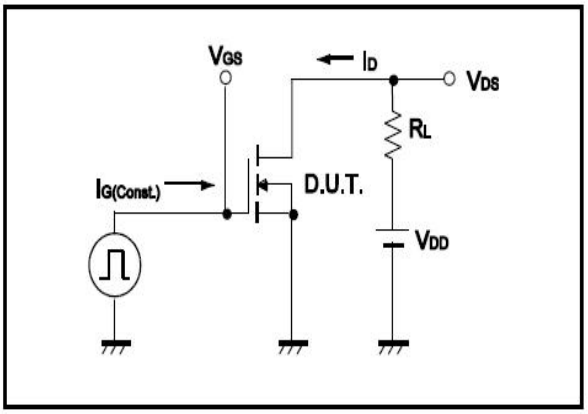


Fig.14 Gate Charge Waveform

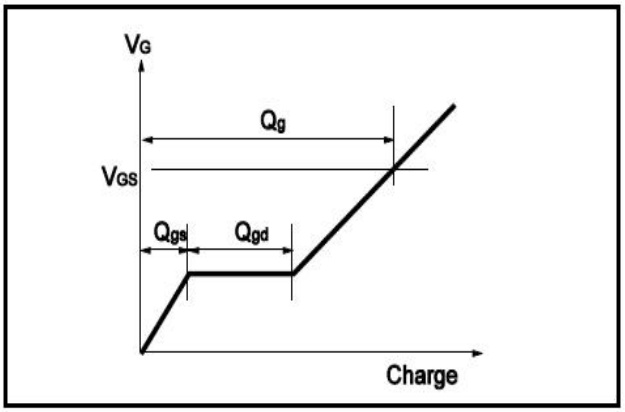


Fig.15 Switching Time Measurement Circuit

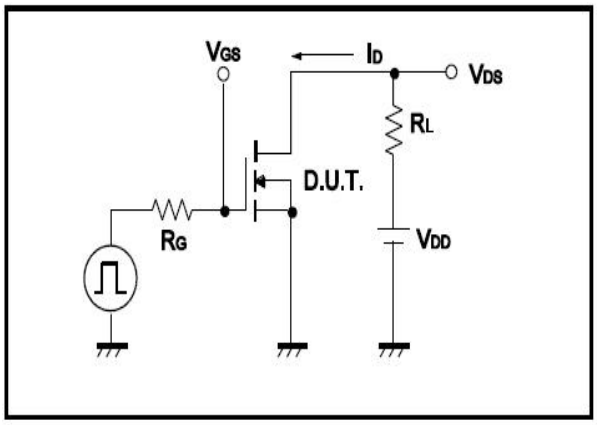


Fig.16 Gate Charge Waveform

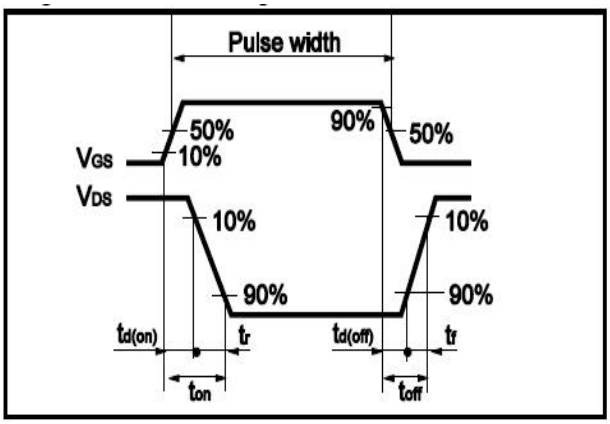


Fig.17 Avalanche Measurement Circuit

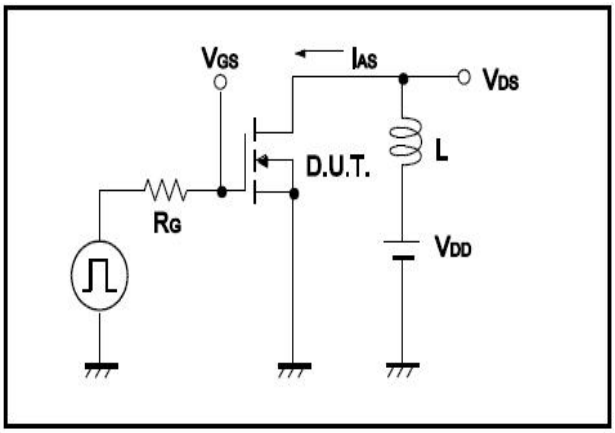
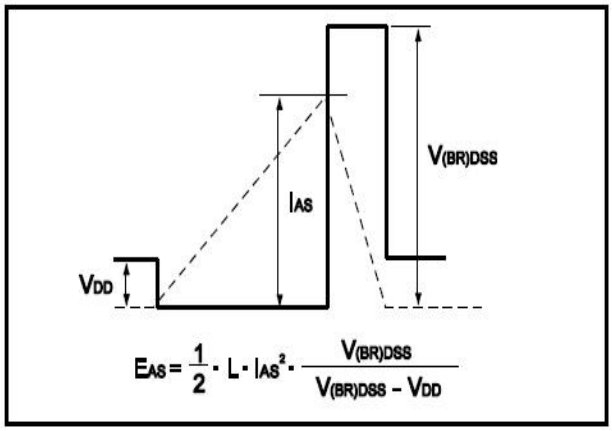
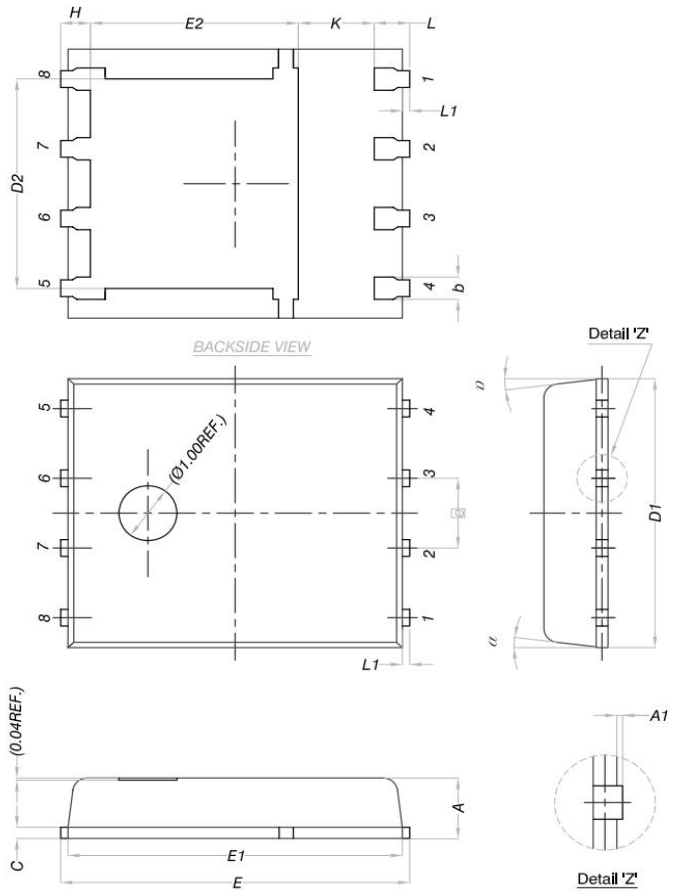


Fig.18 Avalanche Waveform



●Dimensions（DFN5×6）

Unit：mm



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0	-	0.05
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
α	0°	-	12°

Version	Date	Change
A	2017.1.6	
B	2021.6.26	1.Add Dynamic characteristic tf，tr etc.
C	2023.6.5	1.Add Reach,HF figure,2.ID modify
D	2024.8.30	Modified Rdson up limit