● General Description

The ZM062N03M combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

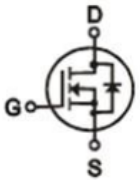
● Features

- ■ 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
- ■SMPS 2nd Synchronous Rectifier
- ■POL application
- ■BLDC Motor driver

● Product Summary

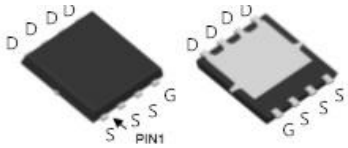


V_{DS}=30V

$R_{DS(ON)}$ =6.5mΩ

I_D=40A

RoHS



DFN3 x 3

●Ordering Information:

Part NO.	ZM062N03M
Marking	ZM062N03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	5000

●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℃	40	A
	$I_{D@}T_C$=75℃	30.4	A
	$I_{D@}T_C$=100℃	25.2	A
	$I_{D@}T_A$=25℃	12.9	A
	$I_{D@}T_A$=70℃	10.4	A
Pulsed Drain Current ①	I_{DM}	100	A
Total Power Dissipation②	$P_{D@}T_C$=25℃	43	W
Total Power Dissipation	$P_{D@}T_A$=25℃	2.3	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃

Single Pulse Avalanche Energy	E_{AS}	210	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case②	R_{thJC}	-	-	2.9	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	54	° 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		6.5	8.5	mΩ
		V_{GS}=4.5V, I_D=10A		10	12	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		9		s
Source-drain voltage	V_{SD}	Is=20A			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz	-	1150	-	pF
Output capacitance	C_{oss}		-	235	-	
Reverse transfer capacitance	C_{rss}		-	120	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Gate Risistance	R_g	f = 1MHz, V_{DS}=25V		1.8		Ω
Total gate charge	Q_g	V_{DD} =25V	-	12	-	nC
Gate - Source charge	Q_{gs}	I_D = 5A	-	4	-	
Gate - Drain charge	Q_{gd}	V_{GS} = 10V	-	6	-	

Turn-ON Delay time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V R_G =3.3Ω, I_D=15A		4.5		ns
Turn-ON Rise time	t_r			12		ns
Turn-Off Delay time	$t_{D(off)}$			26		ns
Turn-Off Fall time	t_f			7.5		ns
Reverse Recovery Time	t_{RR}	VDD = 20 V, dIS/dt = 100 A/s, IS = 15A		9.7		ns
Charge Time	t_a			5.8		ns
Discharge Time	t_b			4.1		ns
Reverse Recovery Charge	Q_{RR}			2.9		nC

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

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

Fig.1 Power Dissipation

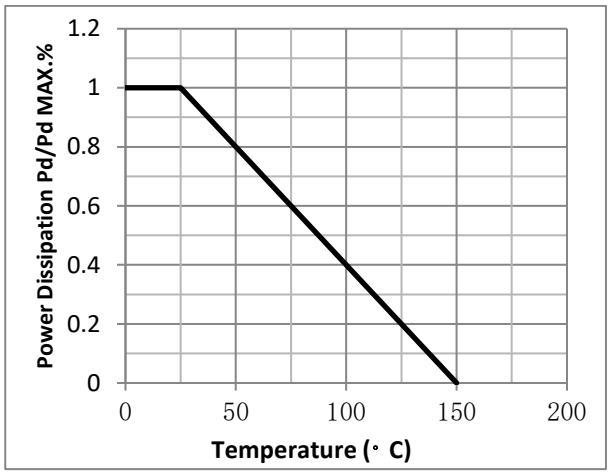


Fig.2 Typical output Characteristics

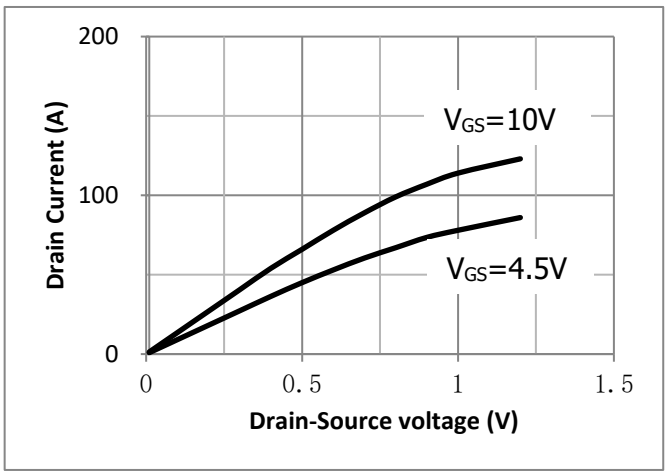


Fig.3 Threshold Voltage V.S Junction Temperature

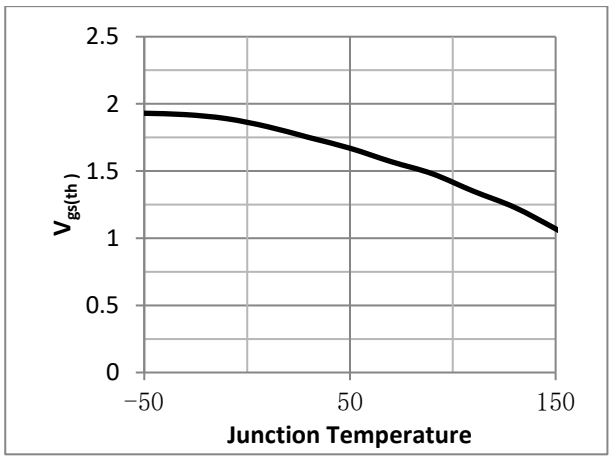


Fig.4 Resistance V.S Drain Current

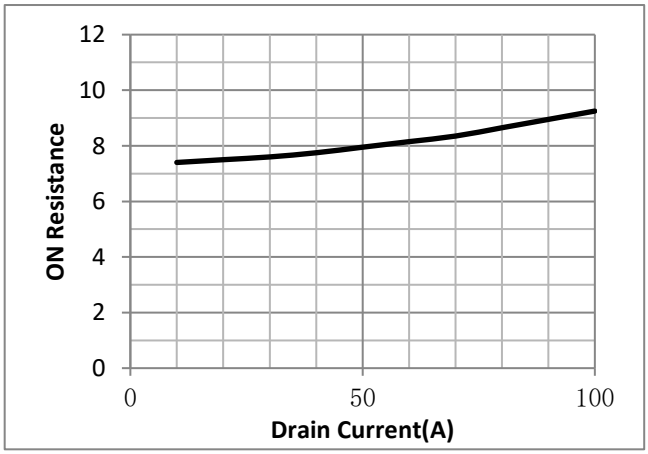


Fig.5 On-Resistance VS Gate Source Voltage

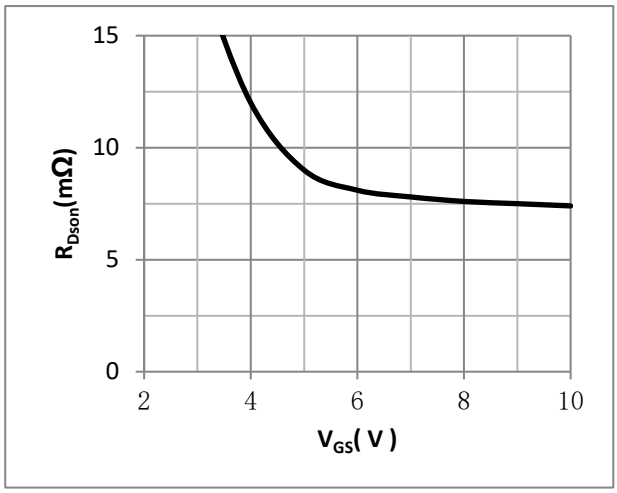


Fig.6 On-Resistance V.S Junction Temperature

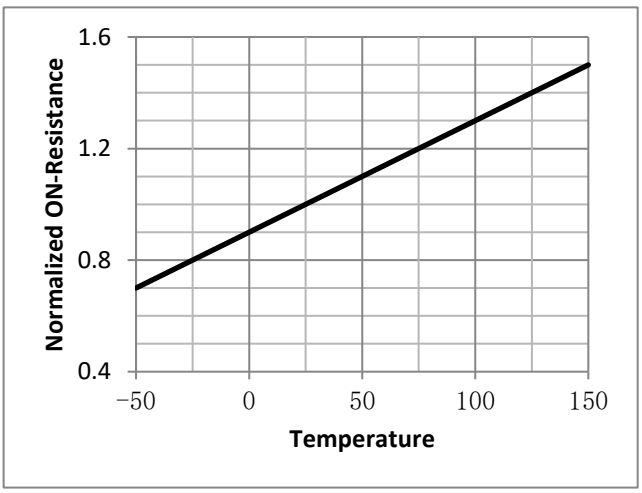


Fig.7 SOA Maximum Safe Operating Area

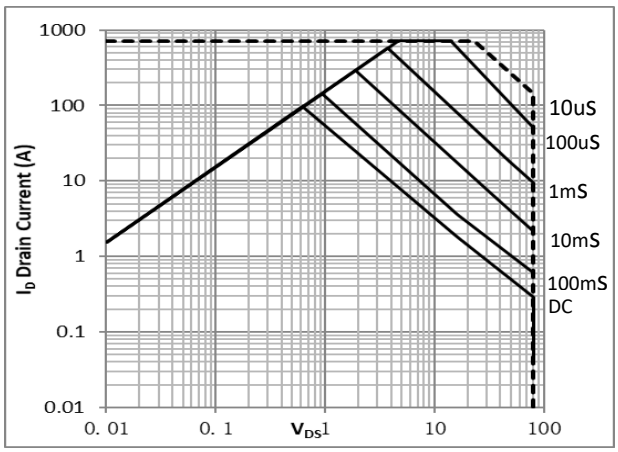


Figure 8. Diode Forward Voltage vs. Current

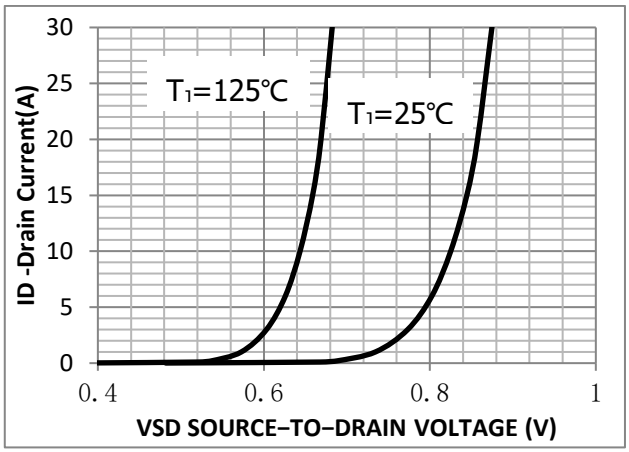


Figure 9. Transfer Characteristics

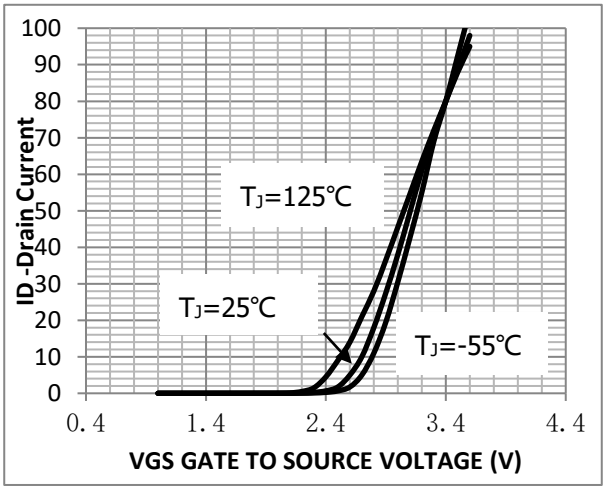


Fig.10 Typical output Characteristics

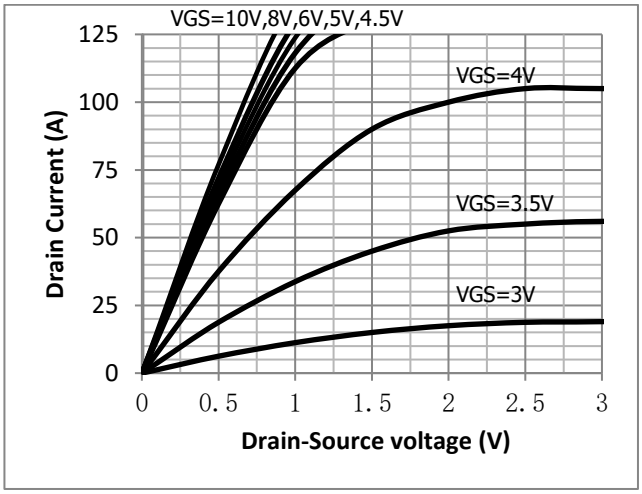


Fig.11 I_D V.S Junction Temperature

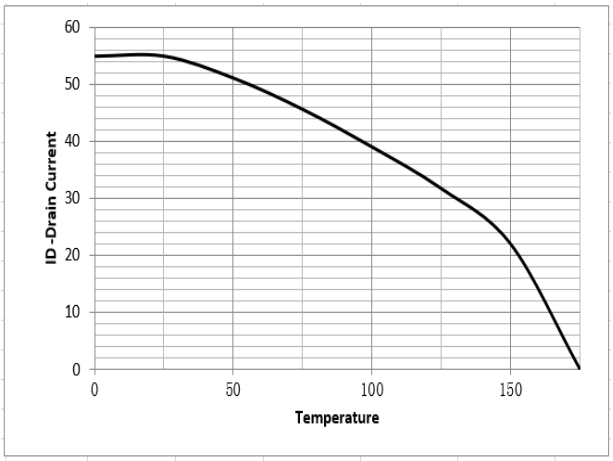


Fig.12 Switching Time Measurement Circuit

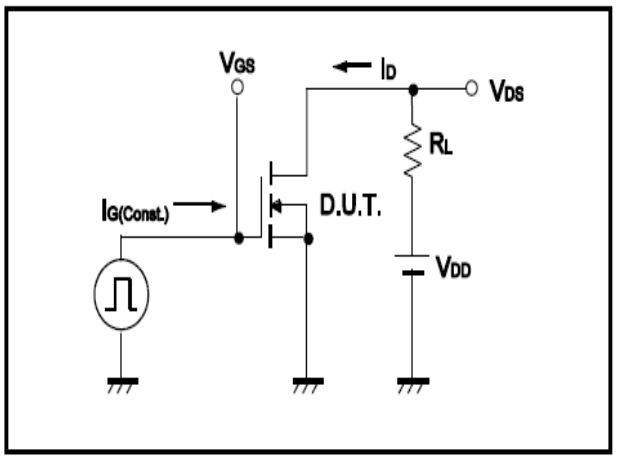


Fig.13 Gate Charge Waveform

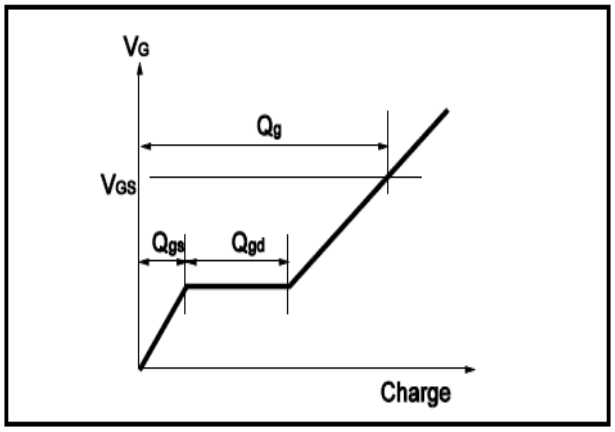


Fig.14 Avalanche Waveform

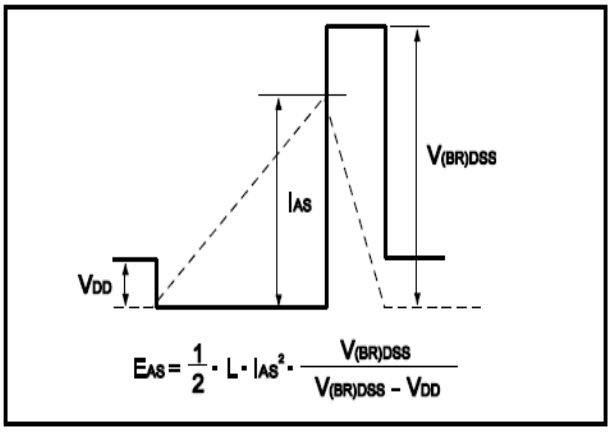


Fig.15 Resistive Switching Test Circuit

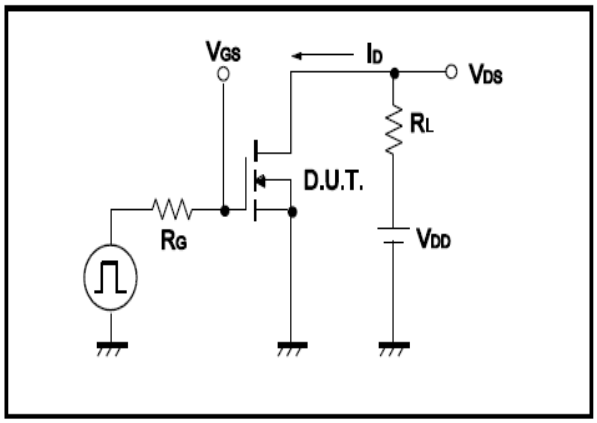


Fig.16 Resistive Switching Test Waveform

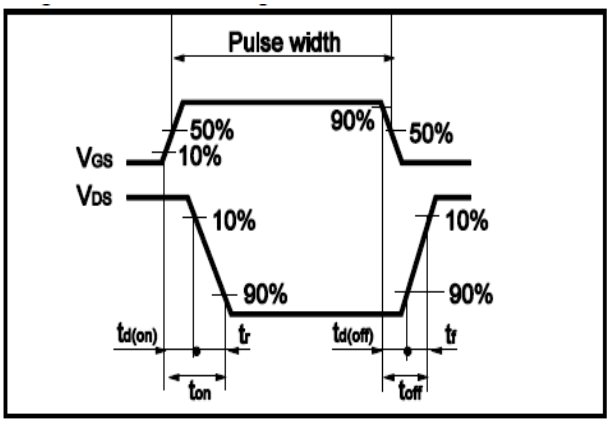
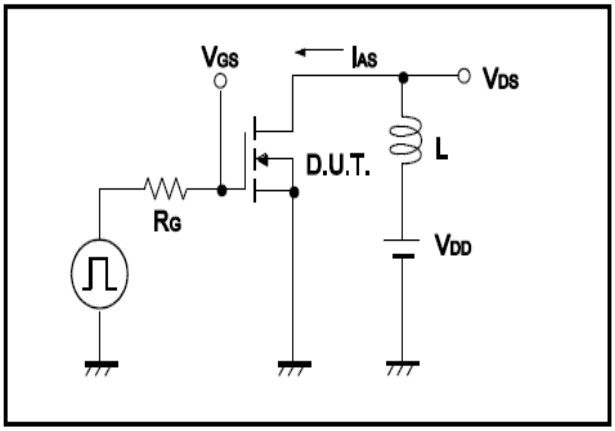
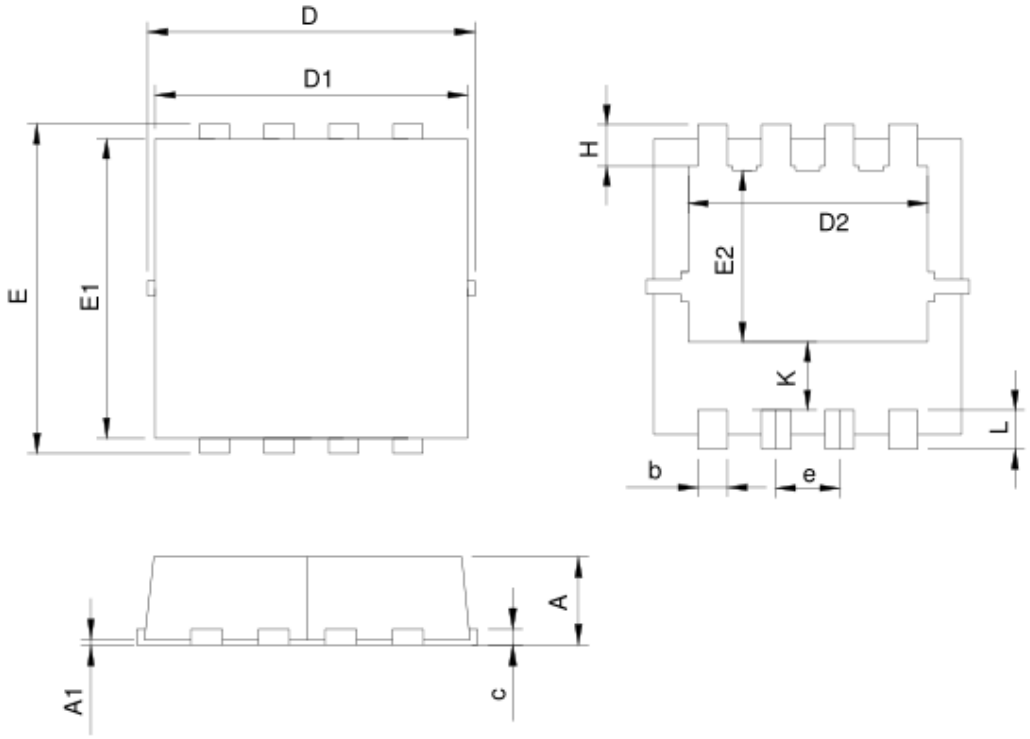


Fig.17 Avalanche Measurement Circuit



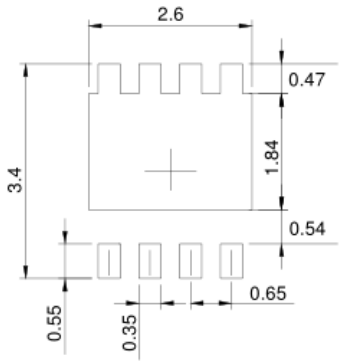
●Dimensions(DFN3×3)

Unit：mm



SYMBOL	DFN3.3x3.3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

RECOMMENDED LAND PATTERN



UNIT: mm