

Features

- Fast switching
- Extremely low on-resistance $R_{DS(on)}$
- 100% single pulse avalanche energy test

Product Summary			
V_{DS}	$R_{DS(on)}$ (m Ω) Typ	I_D (A)	Q_g (Typ)
30V	1.5 @ 10V 90A	160	125nc

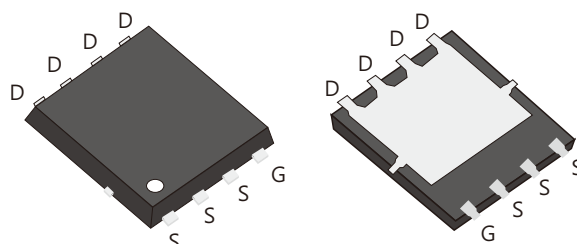
Mechanical Data

- Case:DFN5 \times 6 Package

DFN5 \times 6
D015N03G

Application

- Power switching applications
- Inverter management system
- Electric tools
- Automotive electronics



Ordering Information

Part No.	Package Type	Package	Quantity(box)
D015N03G	DFN5 \times 6	Tape & Reel	5000

Block Diagram

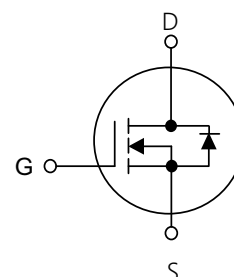


Table1 Absolute Maximum Ratings ($T_c=25^\circ\text{C}$, unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current (Note 5)	$T_c=25^\circ\text{C}$	I_D	160	A
	$T_c=100^\circ\text{C}$		112	
Pulsed Drain Current (Note 1)		I_{DM}	630	A
Single Pulse Avalanche Energy(Note 2)		E_{AS}	440	mJ
Power Dissipation $T_c=25^\circ\text{C}$		P_D	184	W
Operating Junction and Storage Temperature		T_J/T_{STG}	$-55\sim+150$	$^\circ\text{C}$

Table 2. Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance Junction to Ambient,Max	$R_{\theta JA}$	50	$^{\circ}\text{C/W}$
Thermal resistance Junction to Case,Max	$R_{\theta JC}$	0.68	$^{\circ}\text{C/W}$

Table 3. Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V,I _D =250μA	30	-	-	V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =30V,V _{GS} =0V	-	-	1	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =20V,V _{DS} =0V	-	-	100	nA
	Reverse		V _{GS} =-20V,V _{DS} =0V	-	-	-100	nA
On Characteristics(Note 3)							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} ,I _D =250μA	1.0	1.5	2.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V,I _D =90A	-	1.5	2.2	mΩ
			V _{GS} =4.5V,I _D =50A	-	2.5	3.2	
Dynamic Characteristics(Note 4)							
Input Capacitance		C _{ISS}	V _{DS} =15V,V _{GS} =0V,f=1MHz	-	5297	-	pF
Output Capacitance		C _{OSS}		-	787	-	pF
Reverse Transfer Capacitance		C _{RSS}		-	517	-	pF
Gate Resitance		R _G	f=1MHz	-	2.65	-	Ω
Switching Characteristics (Note 4)							
Turn-On Delay Time		t _{d(on)}	V _{DS} =20V,R _{GEN} =2Ω V _{GS} =4.5V,I _D =90A,	-	23	-	ns
Turn-On Rise Time		t _R		-	120	-	ns
Turn-Off Delay Time		t _{d(off)}		-	67	-	ns
Turn-Off Fall Time		t _f		-	128	-	ns
Total Gate Charge		Q _G	V _{DS} =20V,I _D =90A, V _{GS} =10V	-	125	-	nC
Gate-Source Charge		Q _{GS}		-	22	-	nC
Gate-Drain Charge		Q _{GD}		-	37	-	nC
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} =0V, I _S =50A	-	-	1.3	V
Maximum Continuous Drain-Source Diode Forward Current		I _S		-	-	160	A
Reverse Recovery Time		t _{rr}	V _{GS} =0V, I _F =30A dI _F /dt=100A/μs	-	45	-	ns
Reverse Recovery Charge		Q _{RR}		-	27.5	-	nC

Notes : 1 Repetitive Rating:Pulse width limited by maximum junction temperature

2 $L=0.5mH, I_D=42A, V_{DD}=24V, V_{GATE}=30V,$, Starting $T_J=25^{\circ}\text{C}$

3 Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

4 Guaranteed by design,not subject to production

5 The maximum current is limited by the package.

Typical Characteristics Diagrams

Figure 1. Output Characteristics

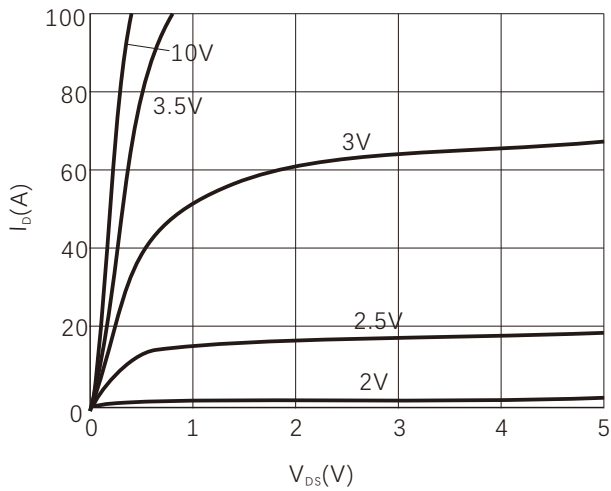


Figure 2. Normalized $R_{DS(on)}$ vs Temperature

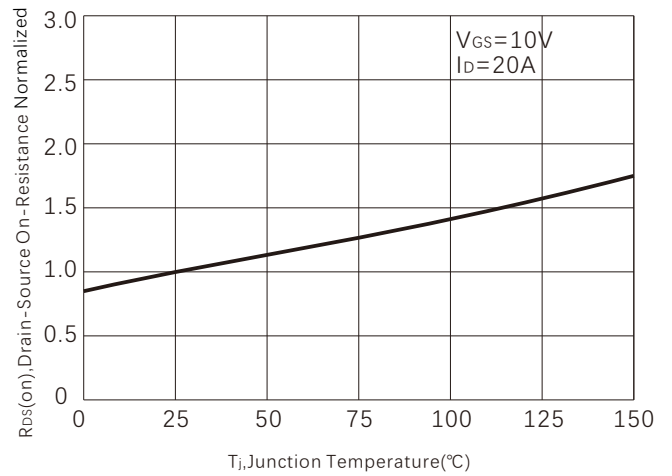


Figure 3. On-Resistance vs. Drain Current

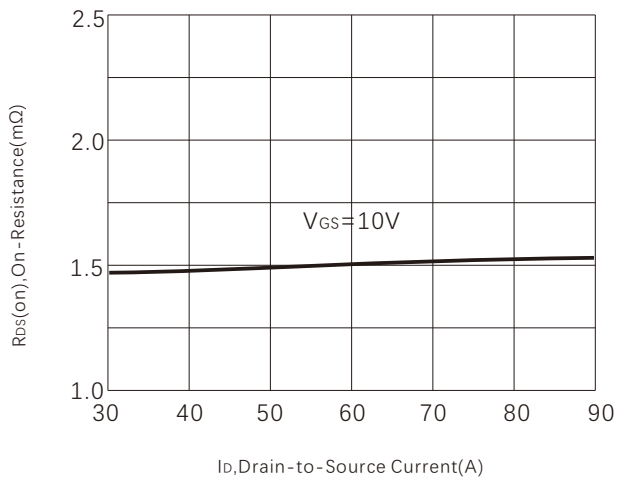


Figure 4. Capacitance

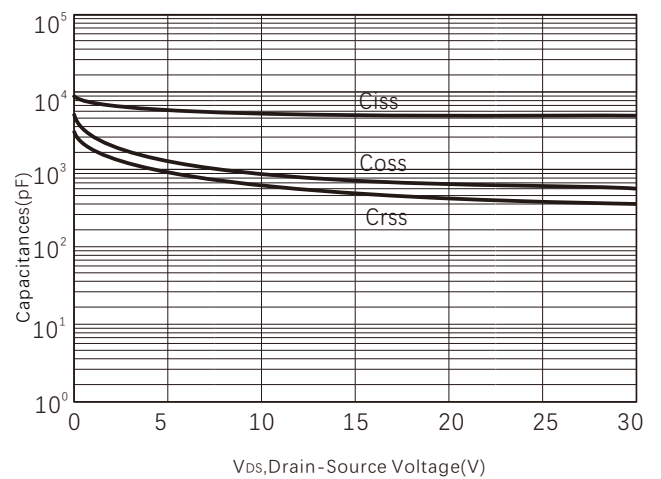


Figure 5. Gate charge

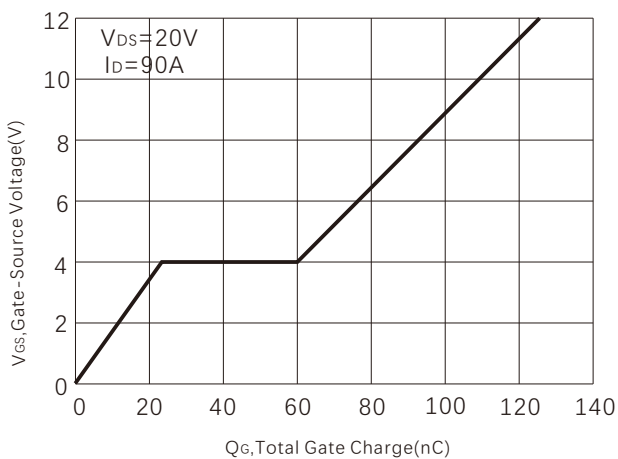


Figure 6. Transfer Characteristics

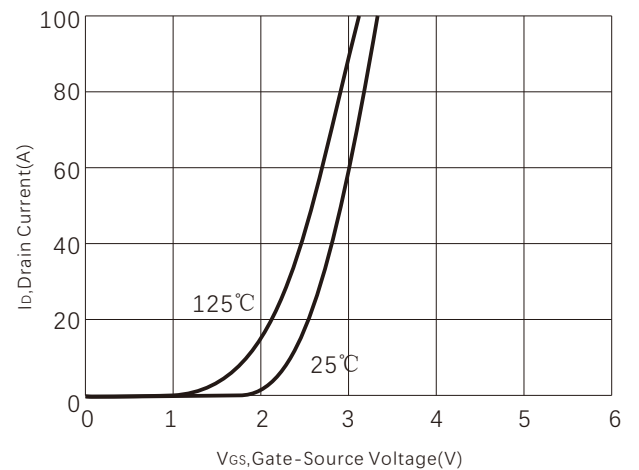


Figure7.Maximum Drain Current vs Temperature

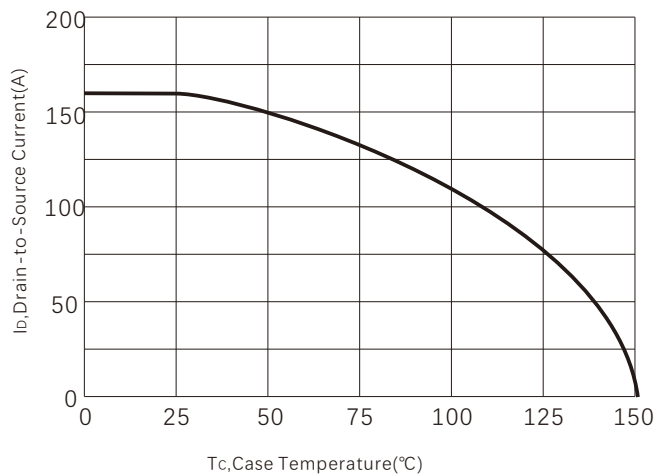


Figure 8. Power dissipation

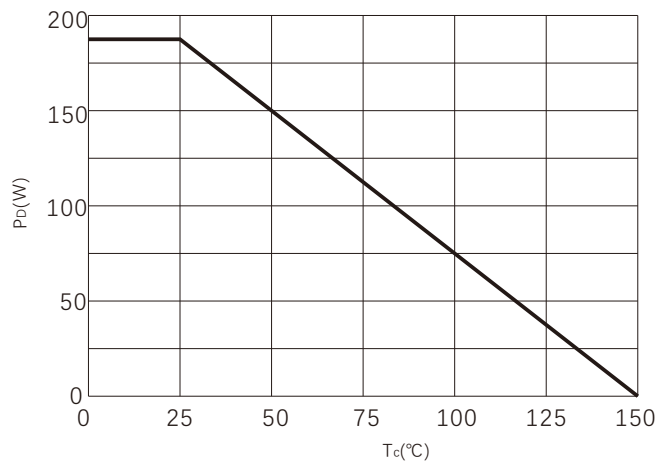


Figure 9. Safe operating area

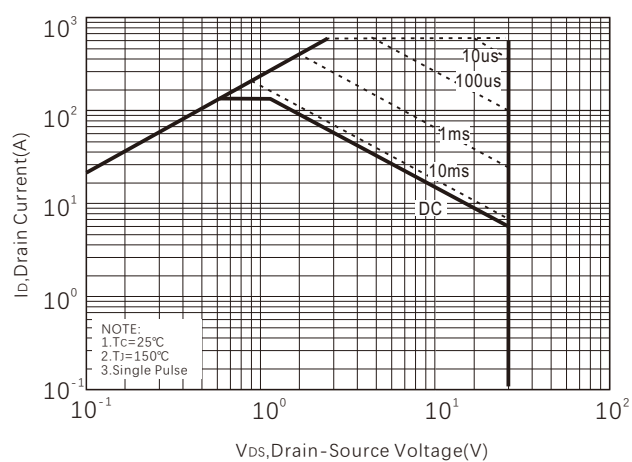
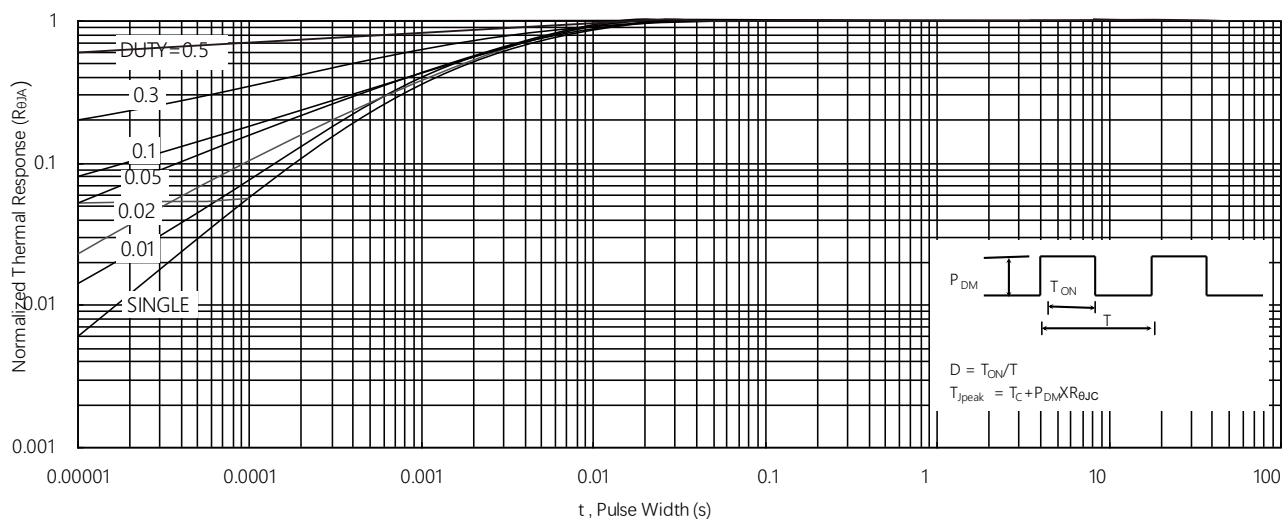
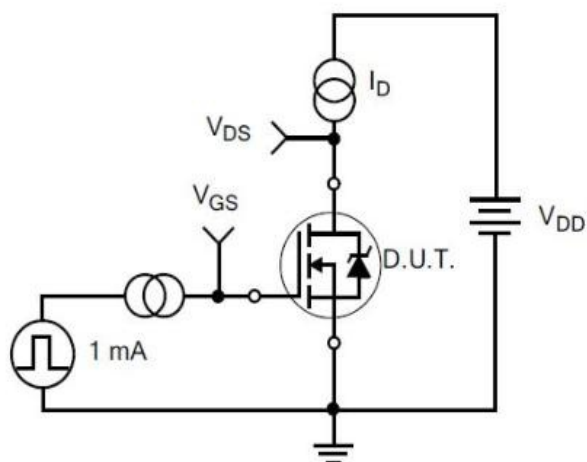


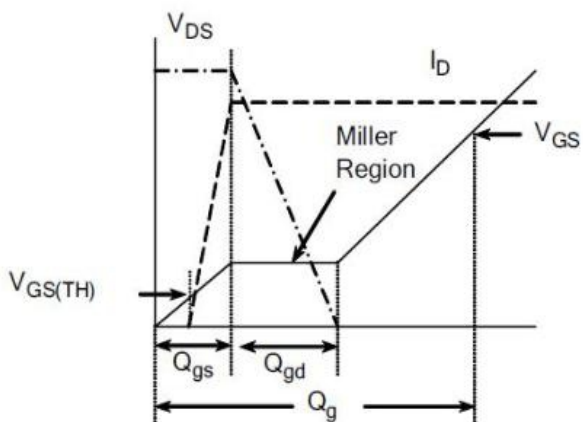
Figure 10.Normalized Maximum Transient Thermal Impedance



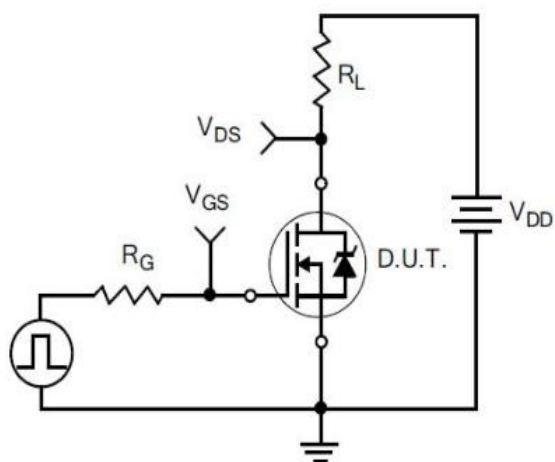
Typical Test Circuit



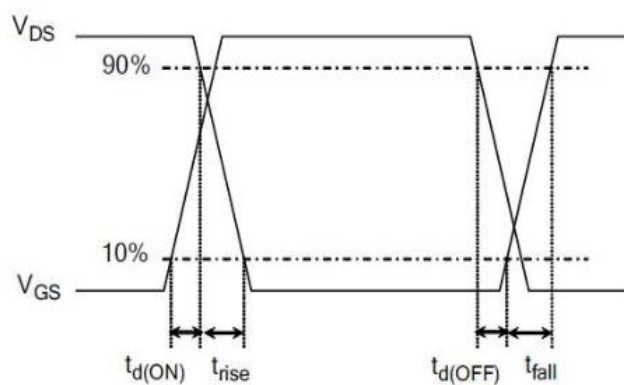
1) Gate Charge Test Circuit



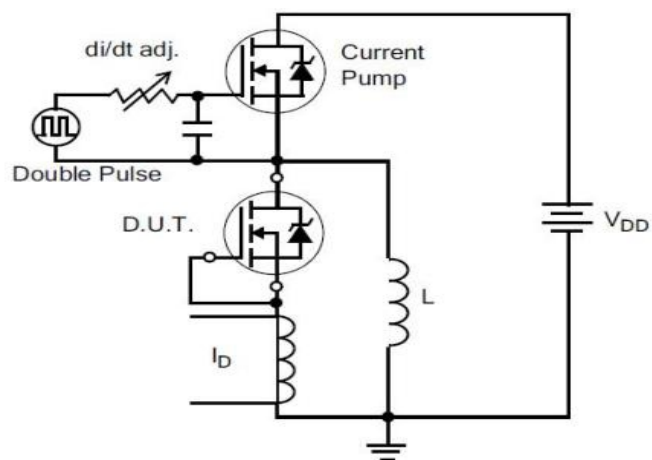
2) . Gate Charge Waveform



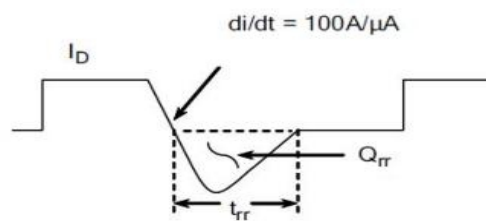
3) Resistive Switching Test Circuit



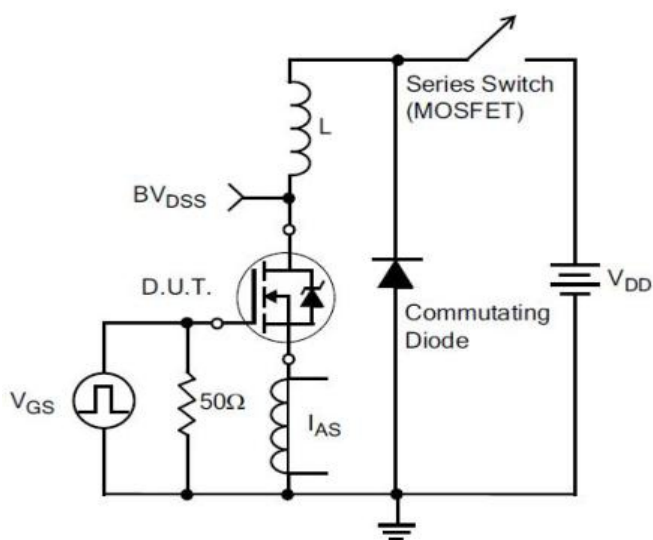
4) Resistive Switching Waveforms



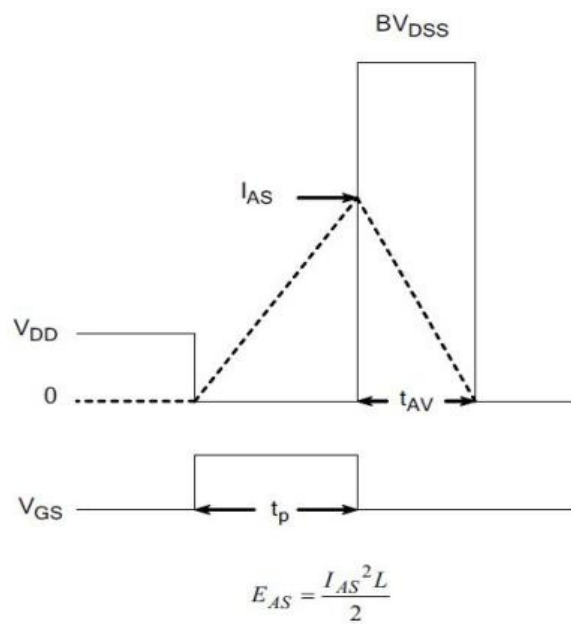
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform



7) . Unclamped Inductive Switching Test Circuit



8) Unclamped Inductive Switching Waveforms

Product Names Rules

X X X X N E X X X

Process Type:
VDMOS:default
Super junction:SJ
Low Voltage trench:D

R_{DS(ON)} Typ
With 3-4Digital,
For Example:
0.8mΩ:0080,
6.7mΩ:067,
10mΩ:10,

Channel Code
N channel:N
P channel:P

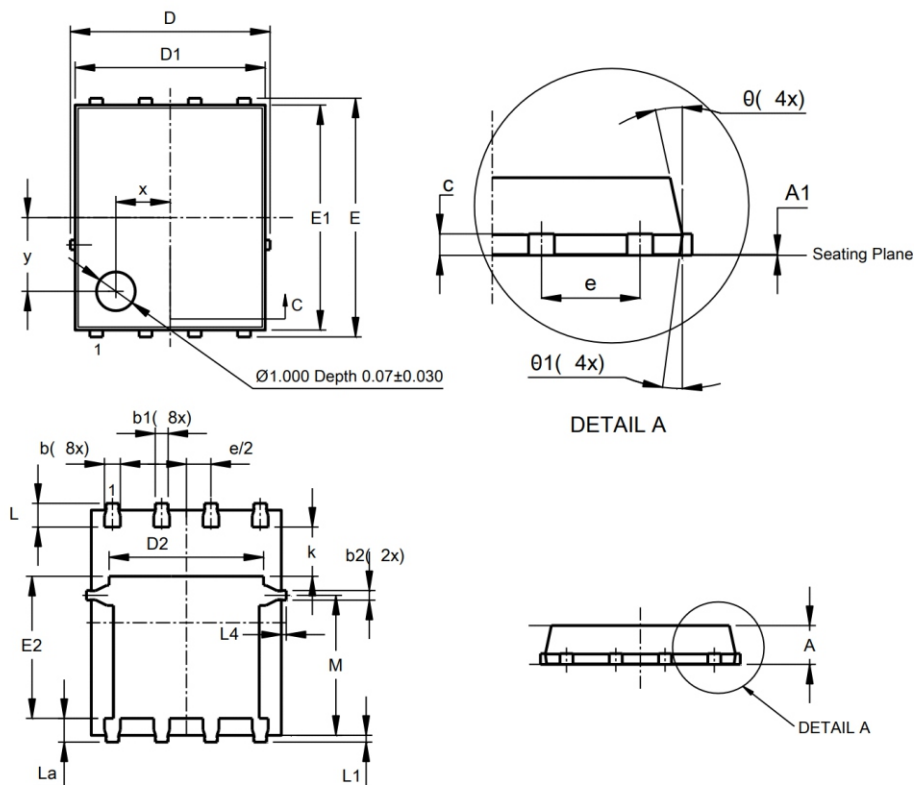
Package Code
TO-220:Default
ITO-220:F
TO-262:E
TO-263:D
TO-252:M
TO-251:N
TO-263-7L:D7
TOLL:T
DFN5×6:G

Rated Voltage Code
With 2 Digital,For Example:
600V:60
60V:06

Special Function Code
G-S ESD Protection:E
No Protection:Default

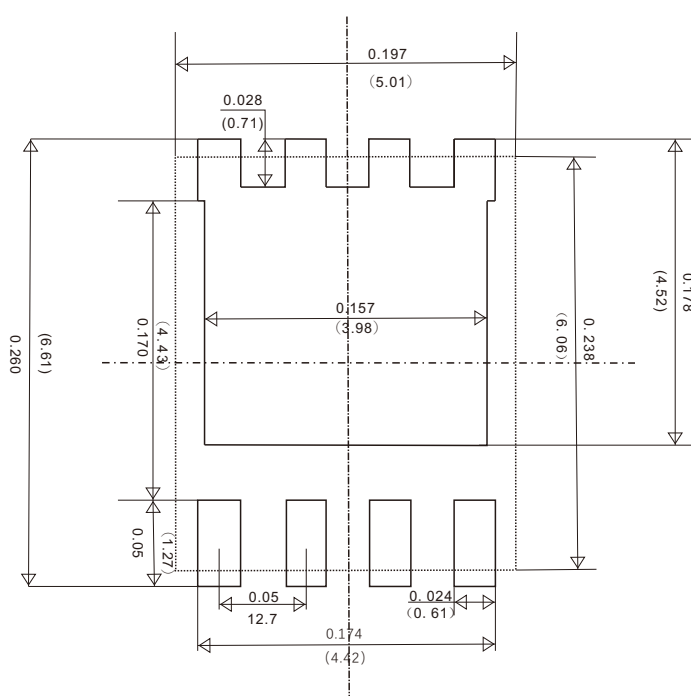
Dimensions

DFN5×6 PACKAGE OUTLINE DIMENSIONS



Dim	Min	Max	Type
A	0.90	1.10	1.00
b	0.23	0.41	0.32
b1	0.24	0.30	0.27
b2	0.16	0.32	0.23
c	0.17	0.27	0.22
D	-	-	5.01
D1	4.80	4.95	4.88
D2	-	-	3.98
E	-	-	6.06
E1	5.72	5.82	5.77
E2	3.42	3.52	3.47
k	-	-	1.33
L	0.56	0.66	0.61
La	0.57	0.67	0.63
L1	0.06	0.15	0.11
L4	-	-	0.06
M	3.00	3.20	3.08
Φ	10	11	10.39

Suggested Pad Layout



Friendship Reminder

- JiNan JingHeng (hereinafter referred to as JH) reserves the right to make changes to this document and its products and specifications at anytime without notice.
- Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.
- JH makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does JH assume any liability for application assistance or customer product design.
- JH does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.
- No license is granted by implication or otherwise under any intellectual property rights of JH.
- JH's products are not authorized for use as critical components in life support devices or systems without express written approval of JH.