PDFN5060 Plastic-Encapsulate MOSFETS

Features

- V_{DS}=30V
- I_D=120A
- $R_{DS(on)}$@V_{GS}=10V ＜ 1.5mΩ
- $R_{DS(on)}$@V_{GS}=4.5V ＜ 2.2mΩ
- High density cell design for ultra low Rdson
- Voltage controlled small signal switch
- Fast Switching Speedze

Drain-source Voltage
30 V
Drain Current
120 Ampere

Applications

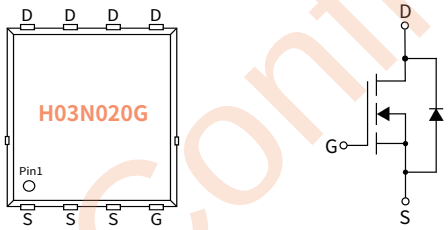
- Power Switching Application
- DC-DC Converters

PDFN5060

Mechanical Data

- Case: PDFN5060
  Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

Function Diagram



Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
PDFN5060	R3	0.09	5000	10000	80000	13''

Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Drain-source Voltage	V_{DS}	V	30
Gate-source Voltage	V_{GS}	V	±20
Drain Current	I_D	A	120
Pulsed Drain Current [1]	I_{DM}	A	480
Total Power Dissipation	P_D	W	105
Single pulse avalanche energy[2]	EAS	mJ	552
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	°C / W	1.19

Static Parameter Characteristics (Tj=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	V	30	—	—
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V	μA	—	—	1.0
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	nA	—	—	±100
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	V	1.0	1.5	2.5
Static Drain-Source On-Resistance (3)	$R_{DS(ON)}$	V_{GS}= 10V, I_D=20A	mΩ	—	1.2	1.5
	$R_{DS(ON)}$	V_{GS}= 4.5V, I_D=15A		—	1.6	2.2

Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, f=1MHZ	pF	—	3135	—
Output Capacitance	C_{oss}			—	2345	—
Reverse Transfer Capacitance	C_{rss}			—	168	—

Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=15V, I_D=12A ,R_{GEN}=2Ω	nS	—	13	—
Turn-on Rise Time	t_r		nS	—	8	—
Turn-off Delay Time	$t_{D(off)}$		nS	—	50	—
Turn-off fall Time	t_f		nS	—	9	—
Total Gate Charge	Q_g	V_{DS}=15V, I_D=12A V_{GS}=10V	nC	—	95	—
Gate-Source Charge	Q_{gs}		nC	—	18	—
Gate-Drain Charge	Q_{gd}		nC	—	17.8	—

Drian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V_{SD}	I_S=120A, V_{GS}=0V	V	—	—	1.2
Maximum Body-Diode Continuous Current	I_S	—	A	—	—	120
Reverse Recovery Time	V_{rr}	I_S=120A, di/dt=100A/us, TJ=25°C	nS	—	65	—
Reverse Recovery Charge	Q_{rr}		nC	—	96	—

Note :
(1)Repetitive Rating: Pulse width limited by maximum junction temperature.
(2)EAS condition : Tj=25°C ,VDD=15V,VG=10V,L=0.5mH,IAS=47A,Rg=25Ω.
(3)Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

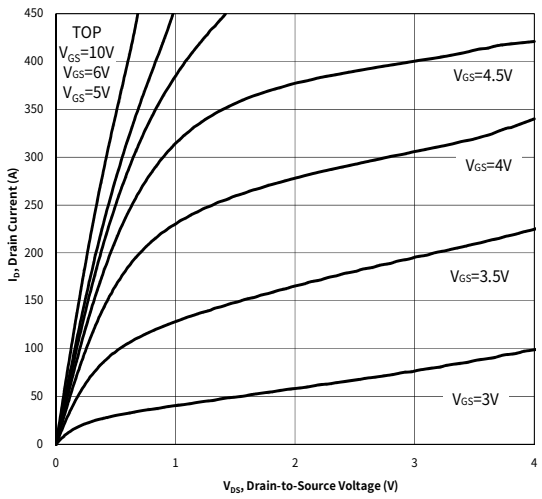


Fig.1 Output Characteristics

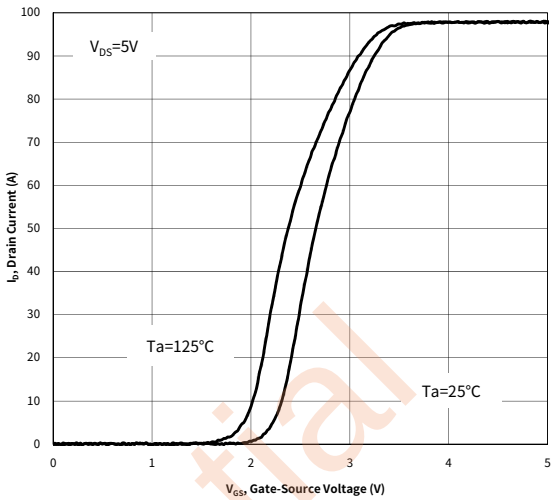


Fig.2 Transfer Characteristics

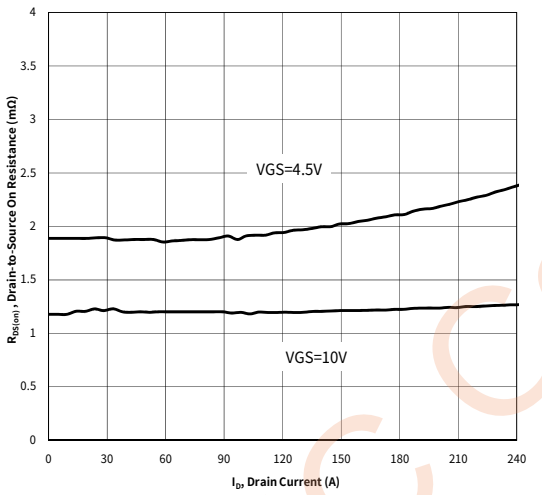


Fig.3 On-Resistance vs. Drain Current and Gate Voltage

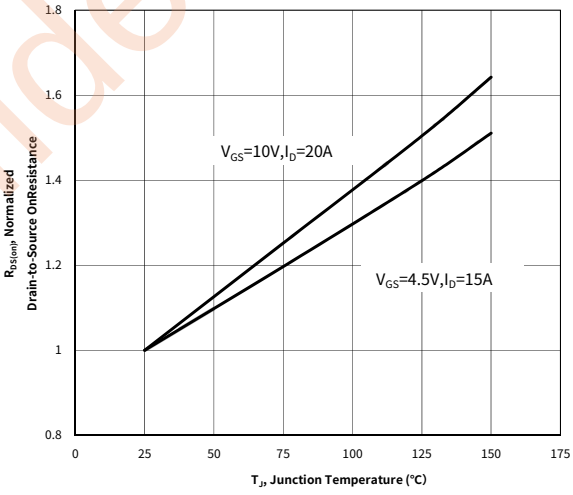


Fig.4 On-Resistance vs. Junction Temperature

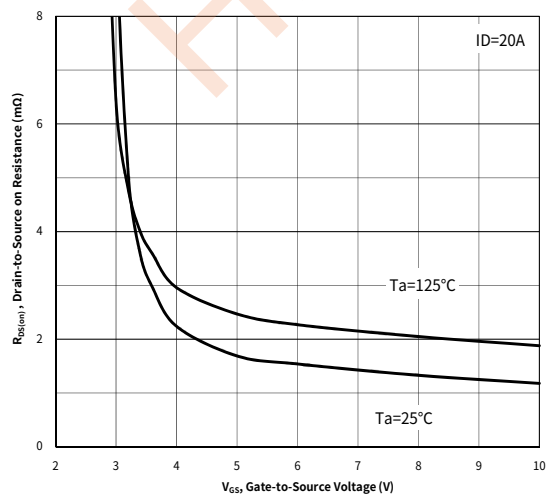


Fig.5 On-Resistance vs. Gate to Source Voltage

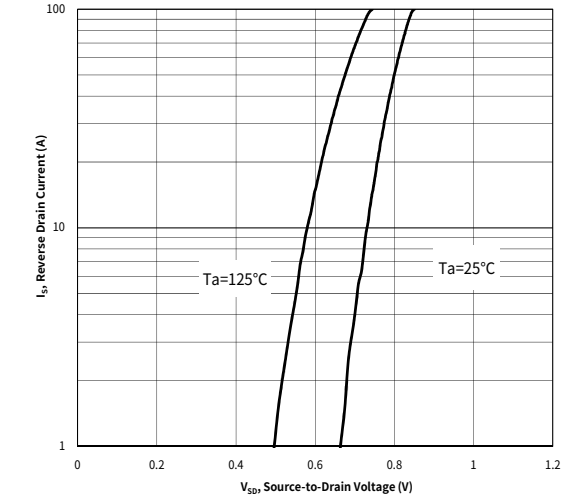


Fig.6 Typical Body-Diode Forward Characteristics

Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

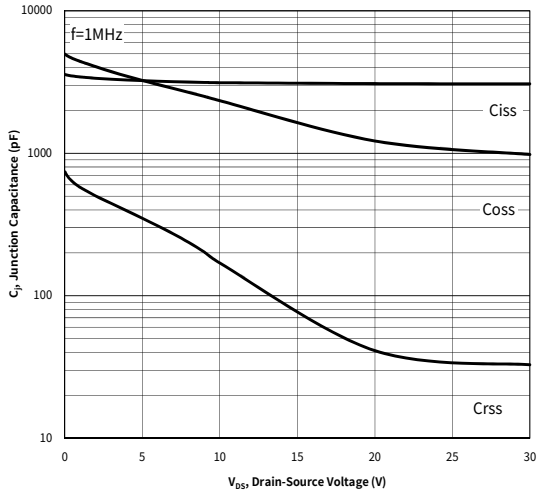


Fig.7 Capacitance Characteristics

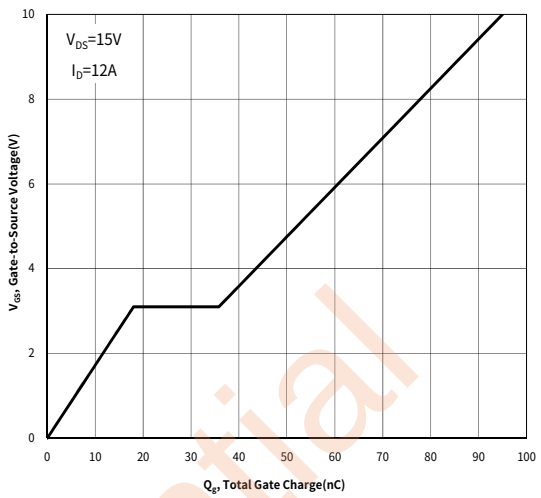


Fig.8 Gate Charge

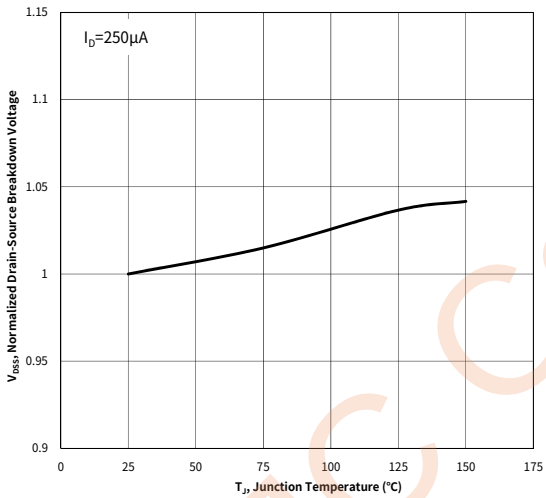


Fig.9 V(BR)DSS vs.Junction Temperature

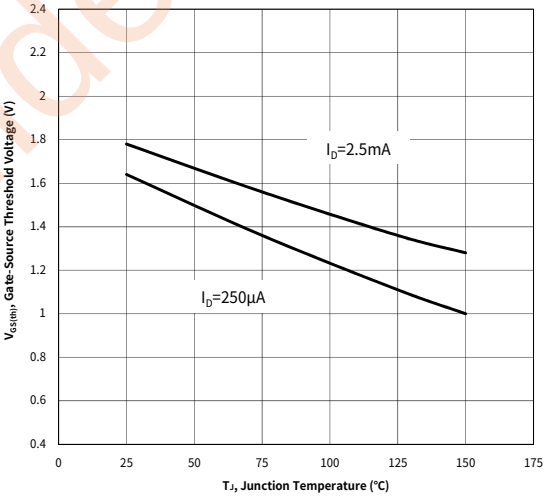


Fig.10 Gate Thresold Variation vs. Tj

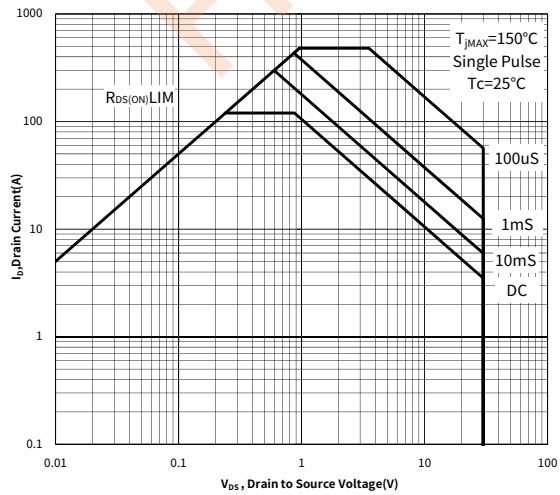


Fig.11 Safe Operation Area

Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

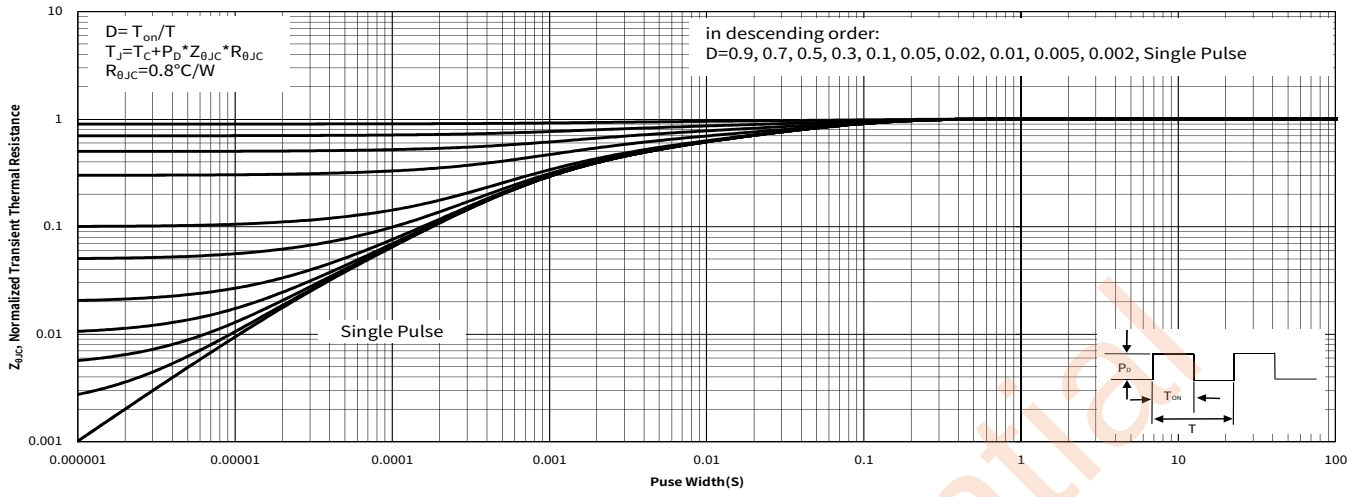
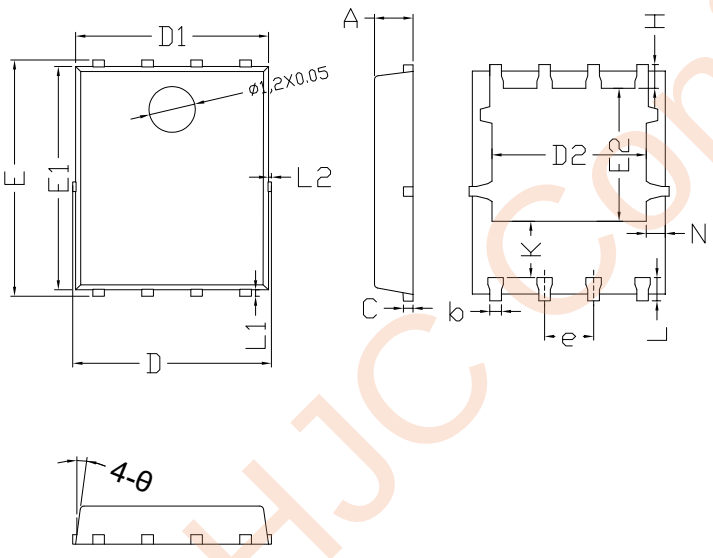


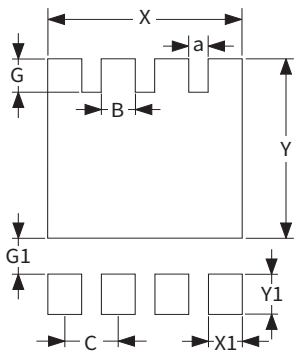
Fig.12 Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (PDFN5060)



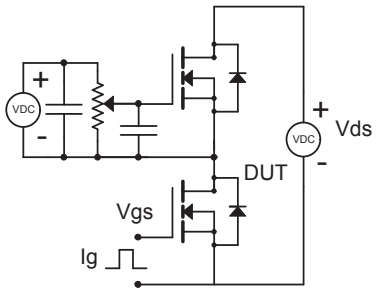
Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.95	1.05	0.037	0.041
b	0.25	0.35	0.010	0.014
C	0.20	0.30	0.008	0.012
D	5.15 BSC		0.203 BSC	
D1	4.90	5.10	0.193	0.201
D2	3.90	4.20	0.154	0.165
e	1.17	1.37	0.046	0.054
E	6.15 BSC		0.242 BSC	
E1	5.75	5.95	0.226	0.234
E2	3.35	3.65	0.132	0.144
H	0.51	0.71	0.020	0.028
K	1.10	1.50	0.043	0.059
L	0.51	0.71	0.020	0.028
L1	0.06	0.20	0.002	0.008
L2	-	0.12	-	0.005
N	0.40	0.60	0.016	0.024
θ	9°	13°	9°	13°

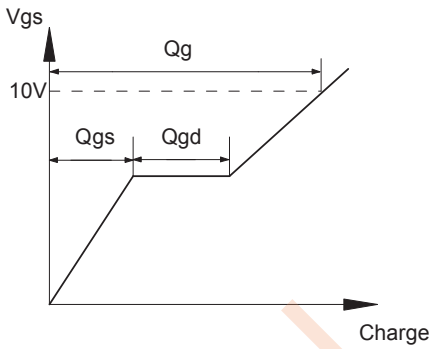
Suggested Pad Layout



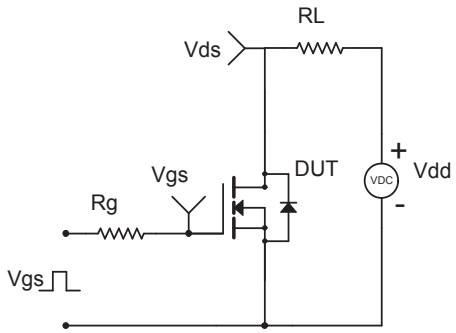
Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
a	0.46	0.48	0.0184	0.0192
B	0.70	0.90	0.028	0.036
C	1.17	1.37	0.0468	0.0548
G	0.75	0.95	0.03	0.038
G1	0.80	1.00	0.032	0.04
X	4.50	4.70	0.180	0.188
X1	0.70	0.90	0.028	0.036
Y	4.40	4.60	0.176	0.184
Y1	0.90	1.10	0.036	0.044

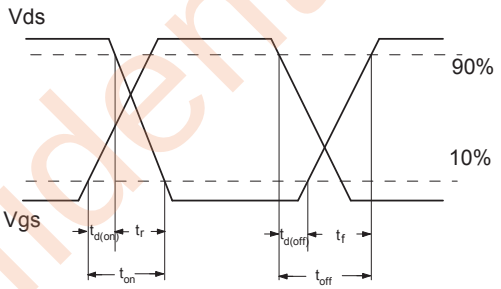
1.Gate Charge Test Circuit & Waveforms



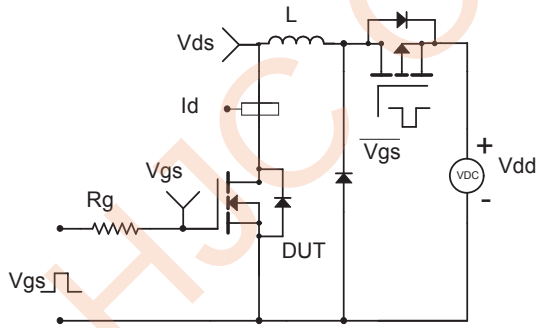


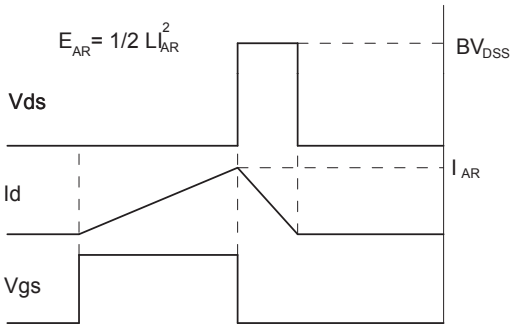
2. Resistive Switching Test Circuit & Waveforms





3.Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





4.Diode Recovery Test Circuit & Waveforms