

PDFN5060 Plastic-Encapsulate MOSFETS

Features

- VDS=100V
- ID=100A
- RDS(on)@VGS=10V < 7.7mΩ
- RDS(on)@VGS=4.5V < 10mΩ
- Advanced Split Gate Trench Technology
- Voltage controlled small signal switch
- Fast Switching Speedze

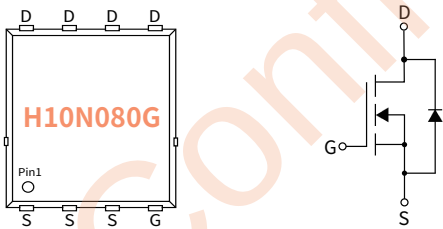
Applications

- DC/DC Converter
- LED Backlighting
- Power Management Switches

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



Drain-source Voltage
100 V
Drain Current
100 Ampere



Ordering Information

Table with 7 columns: PACKAGE, PACKAGE CODE, UNIT WEIGHT(g), REEL(pcs), BOX(pcs), CARTON(pcs), DELIVERY MODE. Row 1: PDFN5060, R3, 0.09, 5000, 10000, 80000, 13"

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

Table with 4 columns: PARAMETER, SYMBOL, UNIT, VALUE. Rows include: Drain-source Voltage (VDS, V, 100), Gate-source Voltage (VGS, V, ±20), Drain Current (ID, A, 100), Pulsed Drain Current (IDM, A, 240), Total Power Dissipation (PD, W, 135), Single pulse avalanche energy (EAS, mJ, 156), Junction temperature (TJ, °C, 150), Storage temperature (Tstg, °C, -55 ~+150), Thermal Resistance Junction-to-Case (RθJC, °C / W, 0.93).

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

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	V	100	—	—
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	μA	—	—	1.0
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	nA	—	—	± 100
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	V	1.5	2	3
Static Drain-Source On-Resistance ⁽³⁾	$R_{DS(ON)}$	$V_{GS}=10V, I_D=40A$	m Ω	—	6.2	7.7
	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=40A$		—	8.6	10

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	pF	—	2335	—
Output Capacitance	C_{oss}			—	1695	—
Reverse Transfer Capacitance	C_{rss}			—	56	—

● Switching Parameters

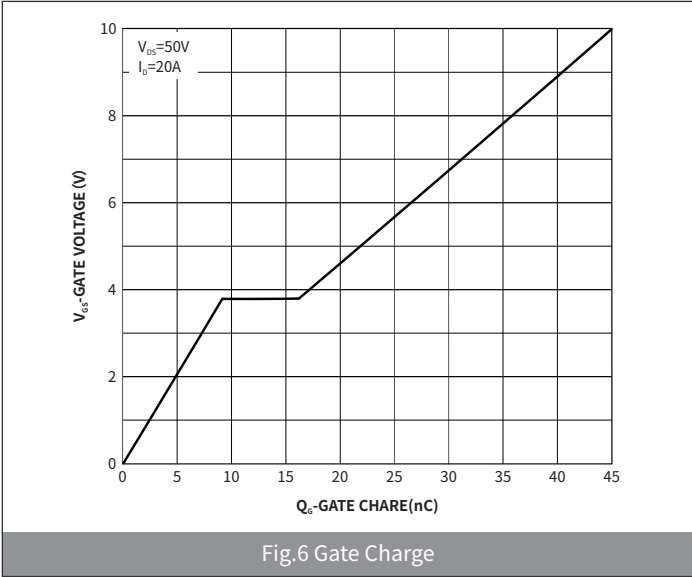
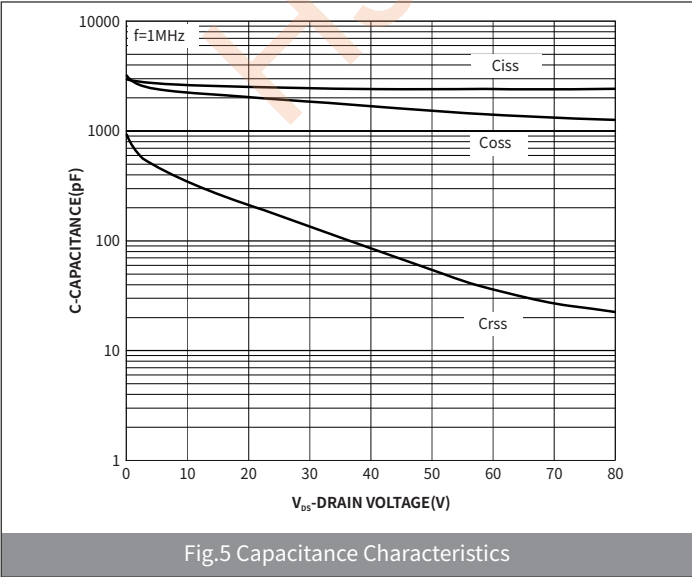
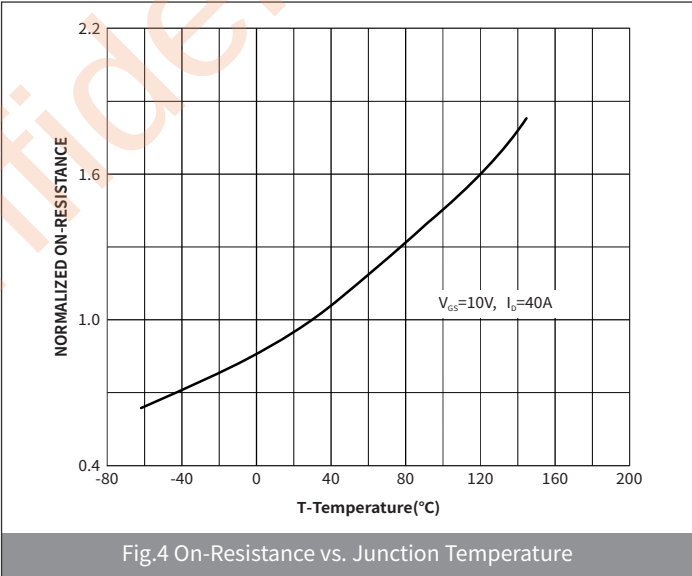
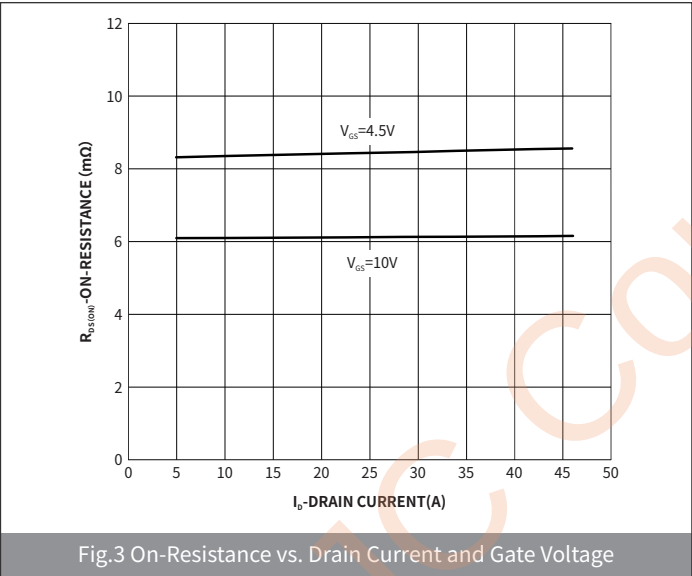
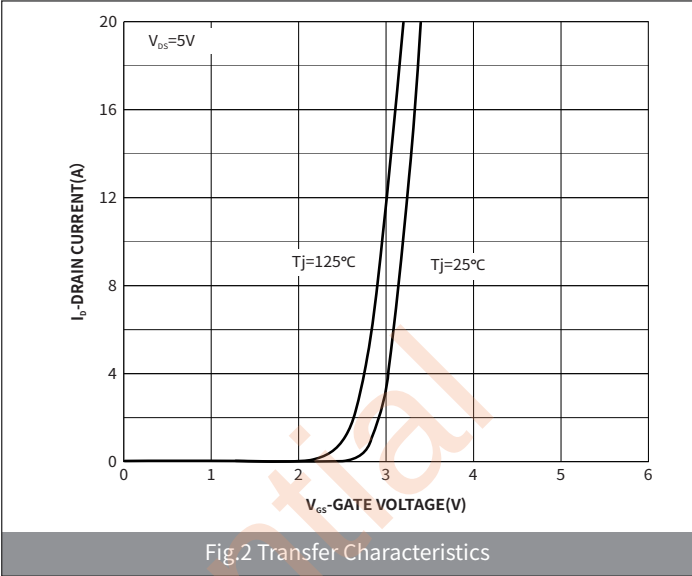
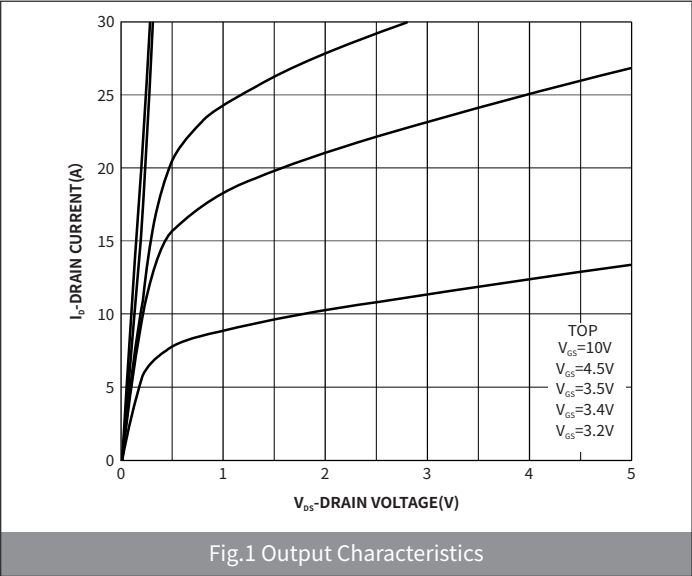
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=50V, I_D=20A, R_{GEN}=3\Omega$	nS	—	12	—
Turn-on Rise Time	t_r		nS	—	15	—
Turn-off Delay Time	$t_{D(off)}$		nS	—	33	—
Turn-off fall Time	t_f		nS	—	20	—
Total Gate Charge	Q_g	$V_{DS}=50V, I_D=20A, V_{GS}=10V$	nC	—	45	—
Gate-Source Charge	Q_{gs}		nC	—	9	—
Gate-Drain Charge	Q_{gd}		nC	—	7	—

● Drian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V_{SD}	$I_S=100, V_{GS}=0V$	V	—	—	1.2
Maximum Body-Diode Continuous Current	I_S	—	A	—	—	100

Note :
(1)Repetitive Rating: Pulse width limited by maximum junction temperature.
(2)EAS condition : Tj=25°C ,VDD=50V,VG=10V,L=0.5mH,IAS=25A,Rg=25Ω.
(3)Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

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



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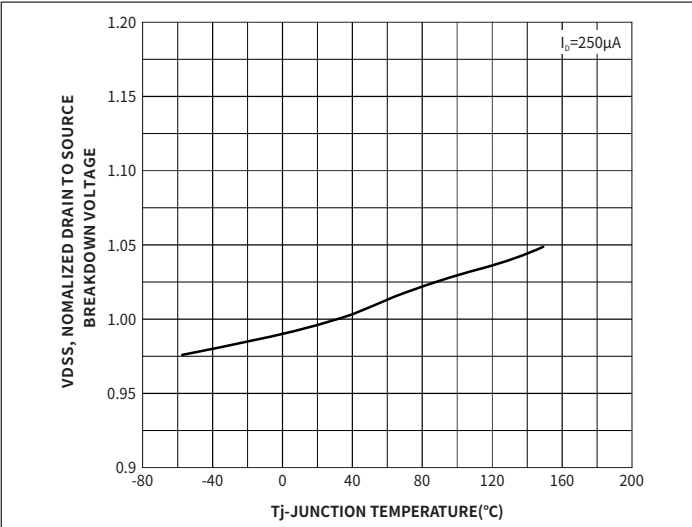


Fig.7 V(BR)DSS vs.Junction Temperature

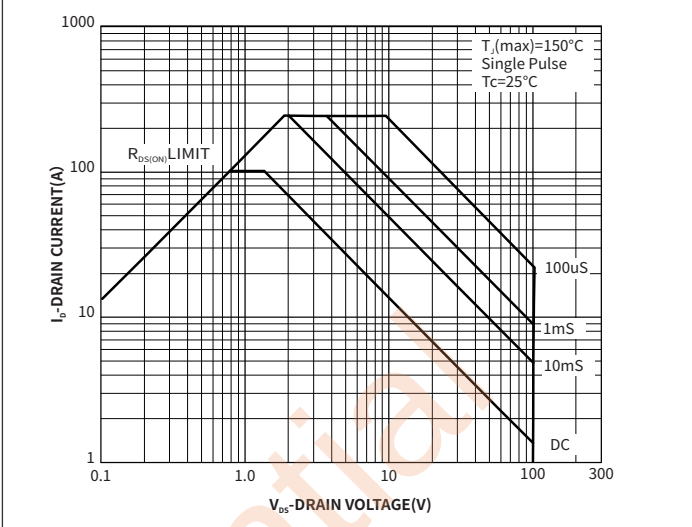


Fig.8 Safe Operation Area

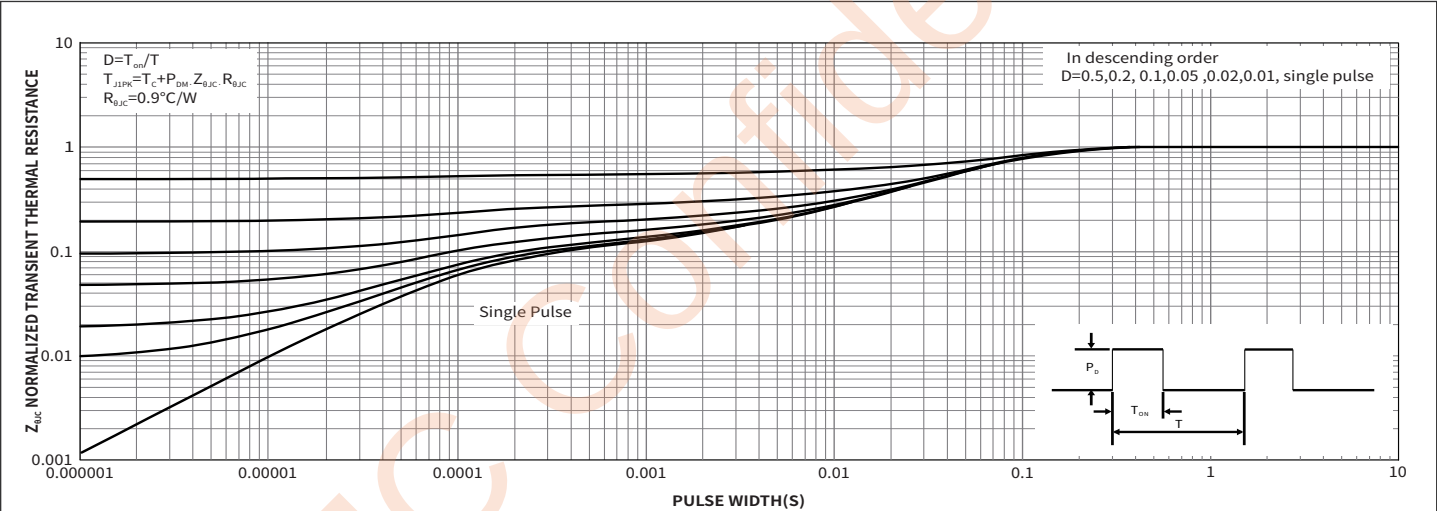
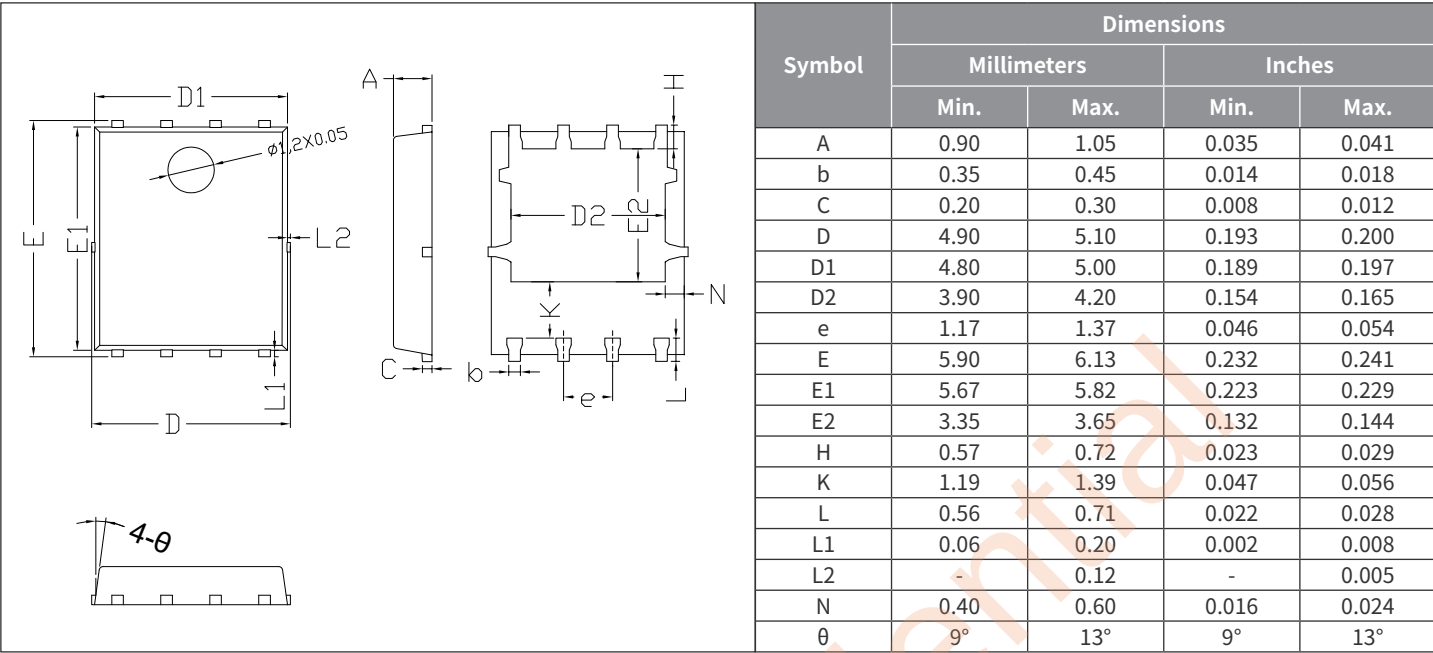


Fig.9 Normalized Maximum Transient Thermal Impedance

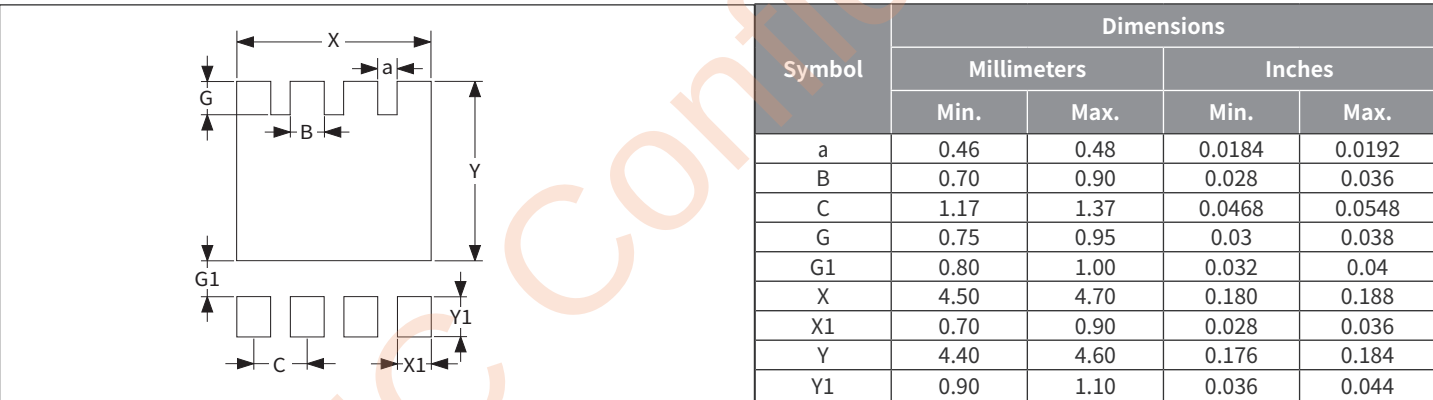
HD510N080SG

N-CHANNEL MOSFET

Package Outline Dimensions (PDFN5060)



Suggested Pad Layout



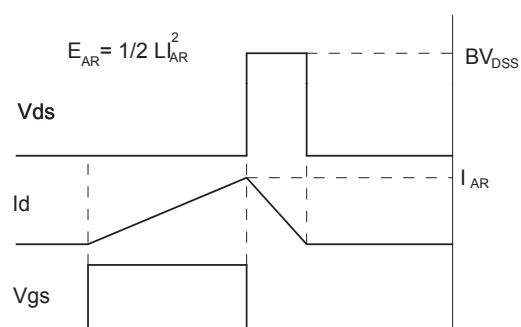
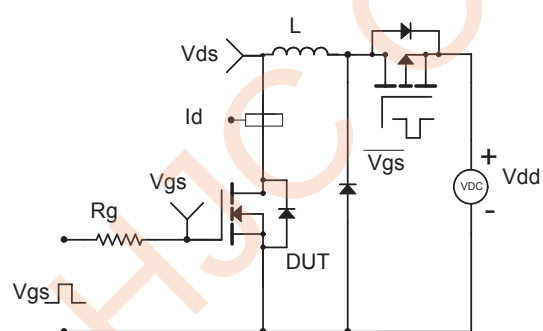
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

