

PDFN5060 Plastic-Encapsulate MOSFETS

Features

- VDS=40V
- ID=45A
- RDS(on)@VGS=10V < 6.9mΩ
- RDS(on)@VGS=4.5V < 10.5mΩ
- Advanced Split Gate Trench Technology
- Low Gate Charge and Rdson
- Fast Switching

Drain-source Voltage
40 V
Drain Current
45 Ampere

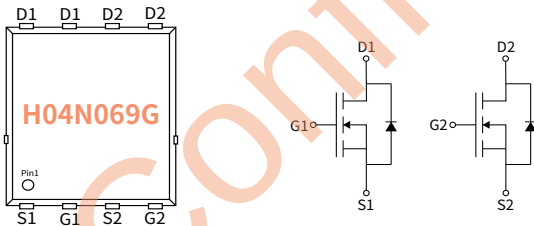
Applications

- DC-DC Converters
- Motor Control

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

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, 40), Gate-source Voltage (VGS, V, ±20), Drain Current (ID, A, 45), Pulsed Drain Current (IDM, A, 180), Total Power Dissipation (PD, W, 92), Single pulse avalanche energy (EAS, mJ, 49), Junction temperature (TJ, °C, -55 ~+150), Storage temperature (Tstg, °C, -55 ~+150), Thermal Resistance Junction-to-Case (RθJC, °C / W, 1.35).

● 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	40	—	—
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, 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 =15A	mΩ	—	5.5	6.9
		V _{GS} = 4.5V, I _D =10A		—	8	10.5

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f=1MHZ	pF	—	917	—
Output Capacitance	C _{oss}			—	537	—
Reverse Transfer Capacitance	C _{rss}			—	24	—

● Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =20V, I _D =20A, R _{GEN} =1.6Ω	nS	—	8	—
Turn-on Rise Time	t _r		nS	—	5	—
Turn-off Delay Time	t _{D(off)}		nS	—	24	—
Turn-off fall Time	t _f		nS	—	3.5	—
Total Gate Charge	Q _g	V _{DS} =20V, I _D =20A V _{GS} =10V	nC	—	35	—
Gate-Source Charge	Q _{gs}		nC	—	6.4	—
Gate-Drain Charge	Q _{gd}		nC	—	3.5	—

● Drian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =45A, V _{GS} =0V	V	—	—	1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	45
Reverse Recovery Time	T _{rr}	I _S =45A, di/dt=300A/us, TJ=25°C	nS	—	14	—
Reverse Recovery Charge	Q _{rr}		nC	—	16	—

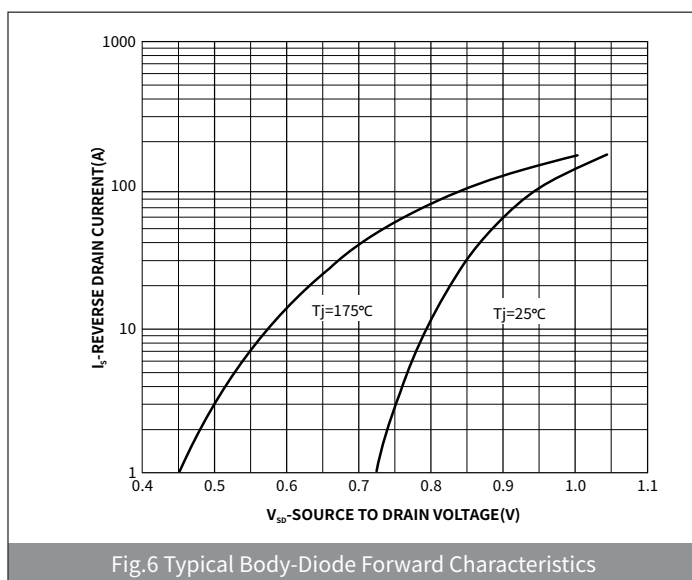
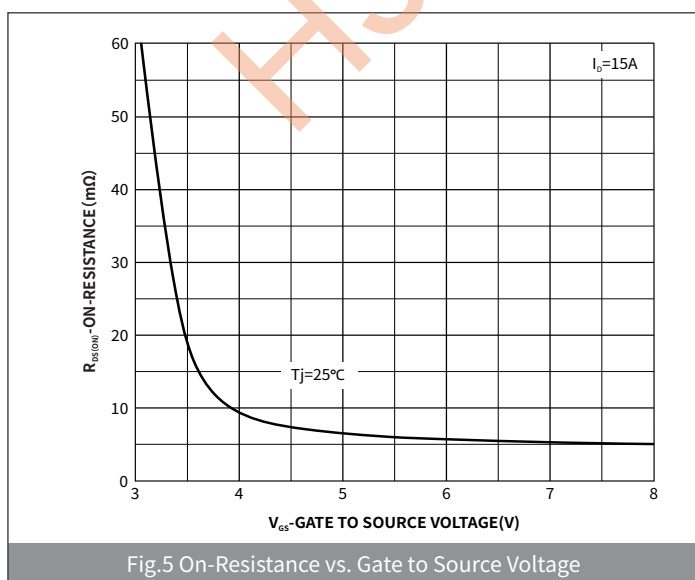
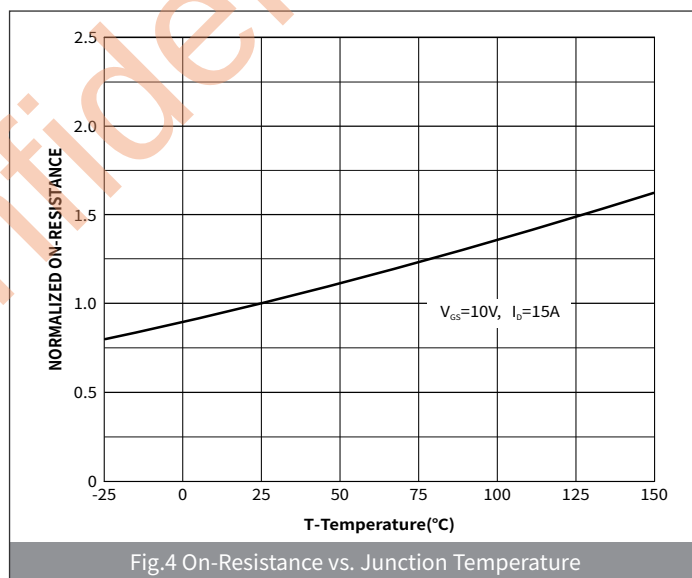
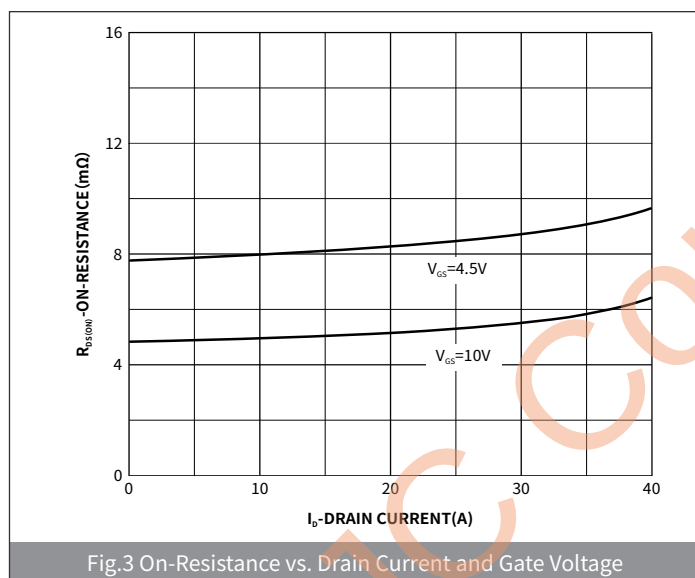
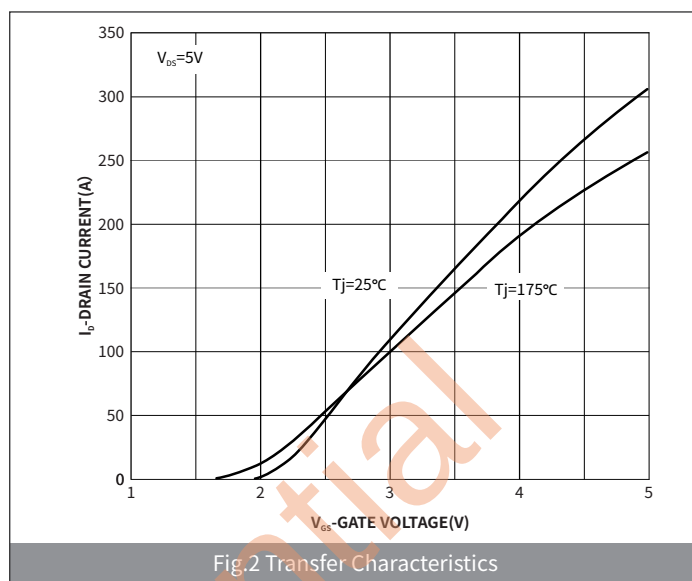
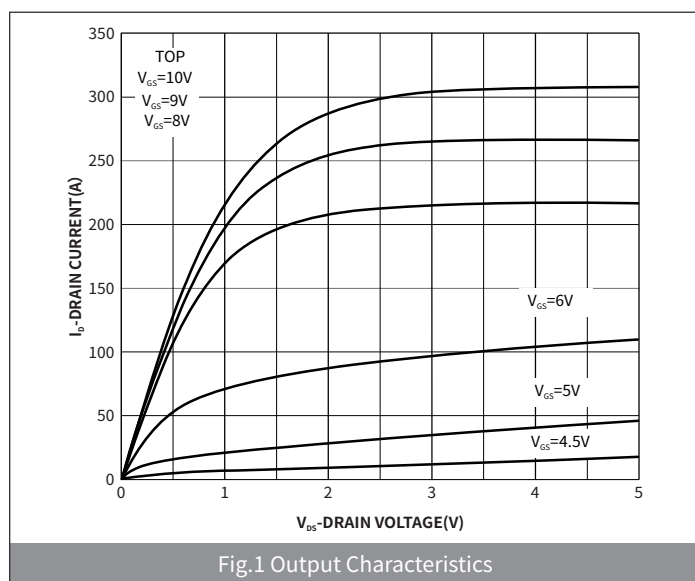
Note :

(1)Repetitive Rating: Pulse width limited by maximum junction temperature.

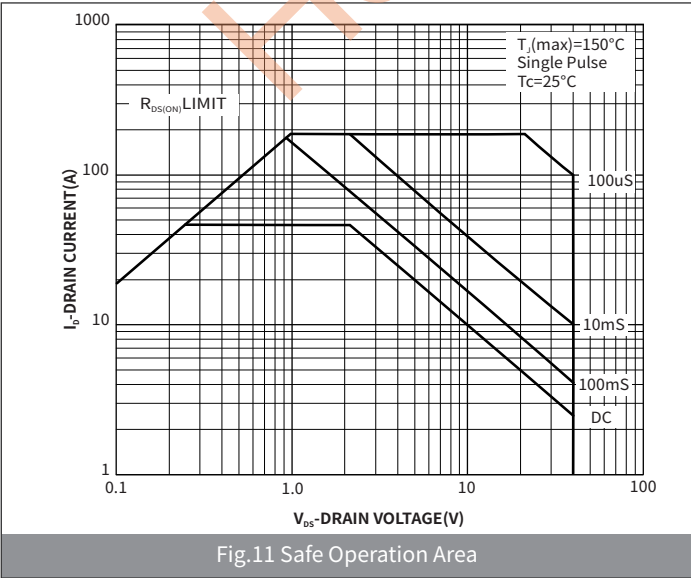
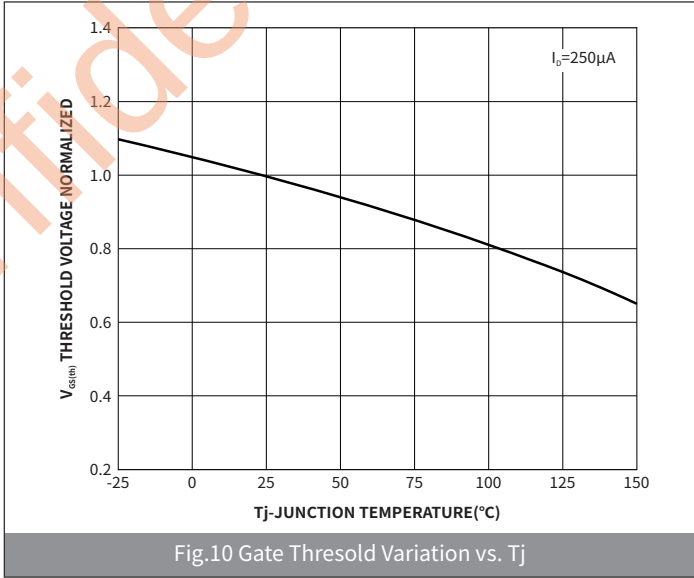
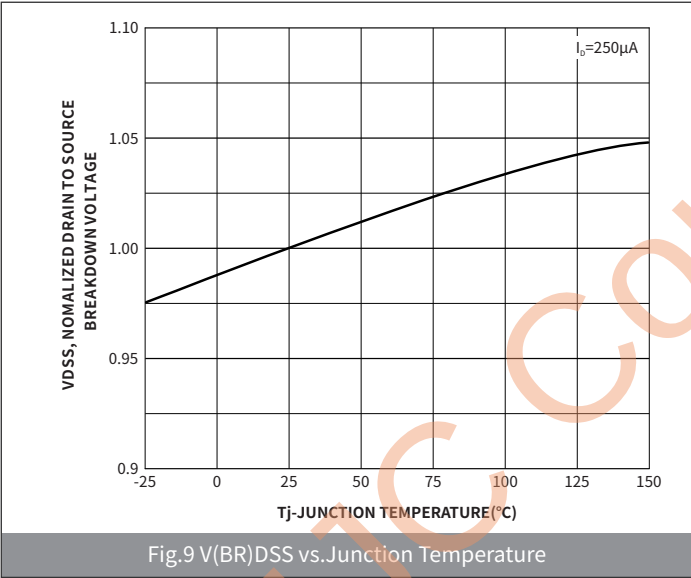
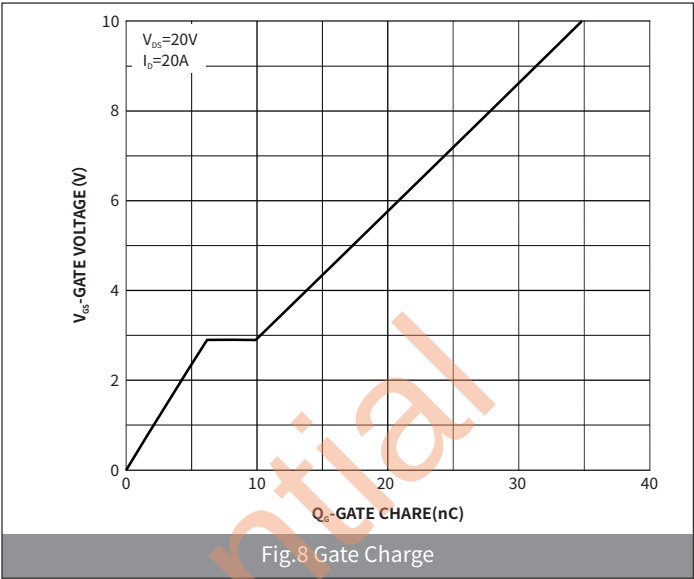
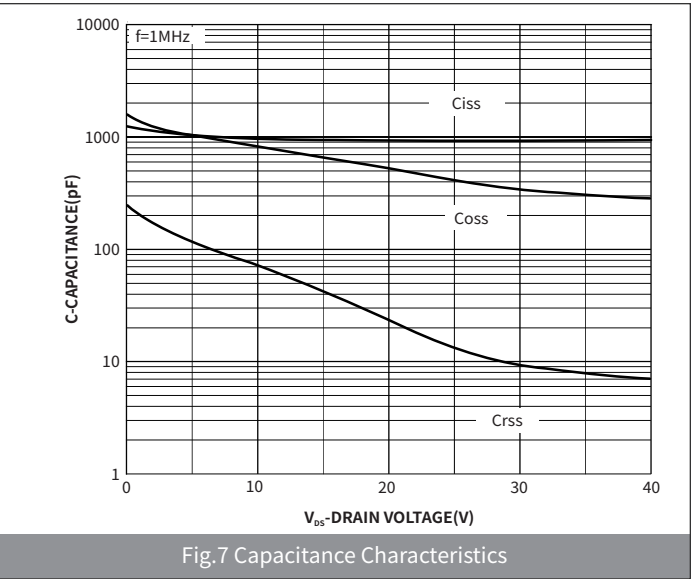
(2)EAS condition : Tj=25°C ,VDD=20V,VG=10V,L=0.5mH,IAS=14A,Rg=25Ω.

(3)Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

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



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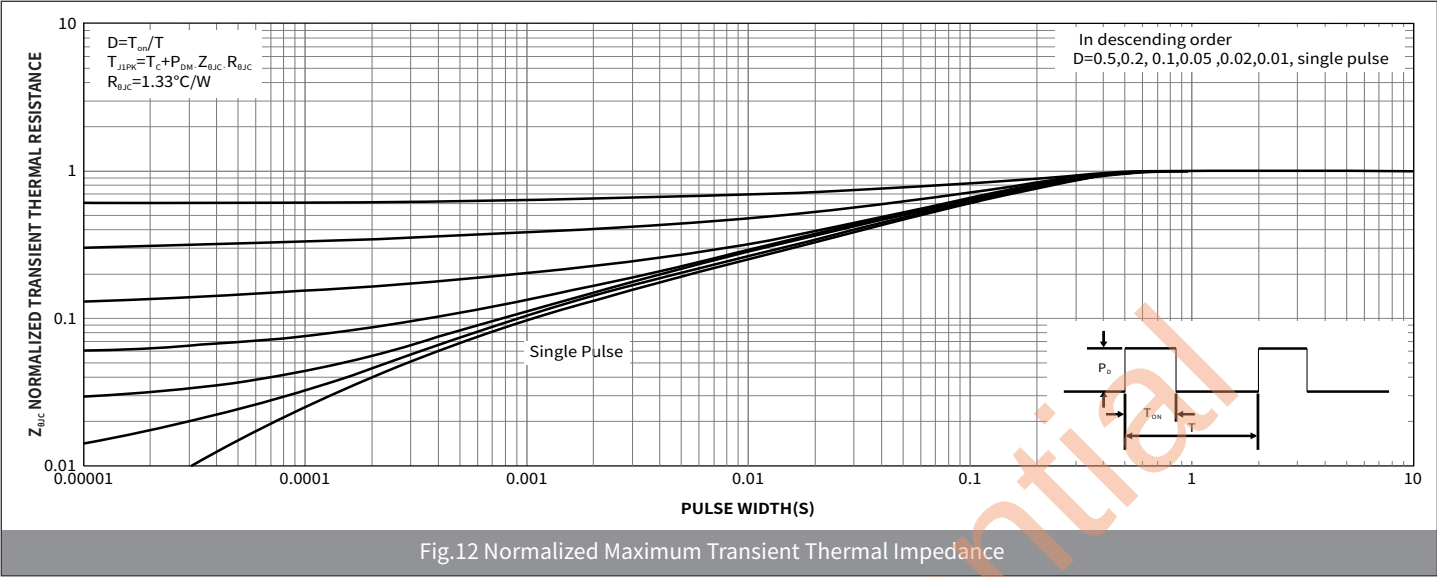


Fig.12 Normalized Maximum Transient Thermal Impedance

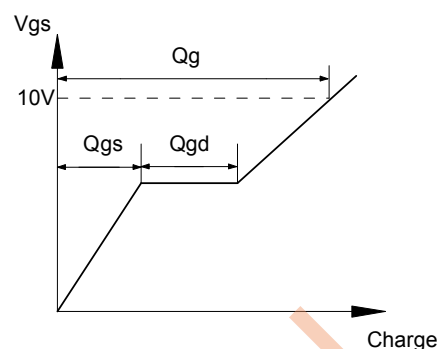
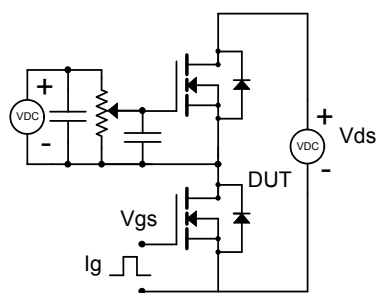
● Package Outline Dimensions (PDFN5060)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	5.94	6.12	0.235	0.241
A1	5.67	5.82	0.223	0.229
A2	0.90	1.00	0.035	0.039
B	4.94	5.10	0.195	0.201
B1	4.82	5.00	0.190	0.197
C	0.21	0.34	0.008	0.013
E	1.47	1.87	0.058	0.074
E1	3.38	3.58	0.133	0.141
H	0.424	0.576	0.017	0.023
H1	0.56	0.71	0.022	0.028
L	0.35	0.45	0.014	0.018
L1	1.19	1.39	0.047	0.055
L2	1.17	1.37	0.046	0.054
θ	10°	12°	10°	12°
Φ	1.10	1.30	0.043	0.051

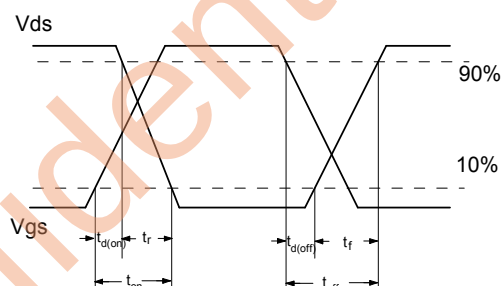
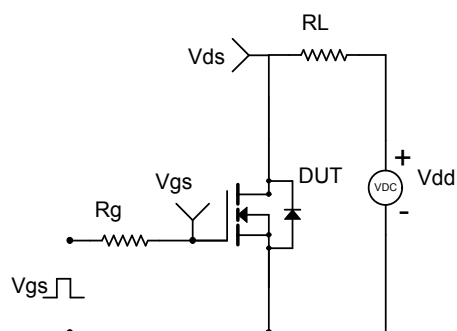
● Suggested Pad Layout

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.52	0.170	0.178
B	6.51	6.71	0.256	0.264
C	3.71	3.91	0.146	0.154
D	3.81	4.01	0.150	0.158
E	1.17	1.37	0.046	0.054
F	0.92	1.12	0.036	0.044
G	0.51	0.71	0.020	0.028
H	0.56	0.76	0.022	0.030
L	0.72	0.92	0.028	0.036

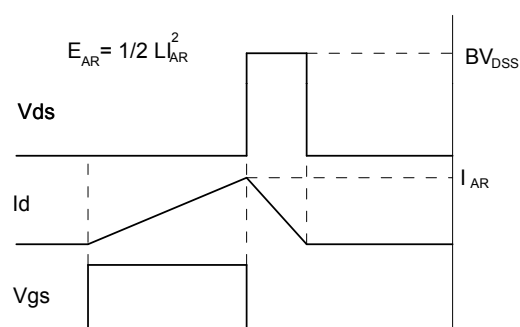
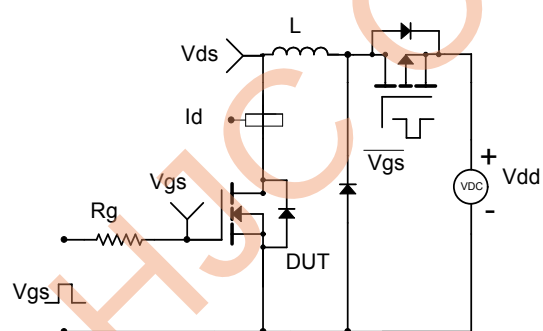
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

