

BMO04N480

N-channel MOSFET

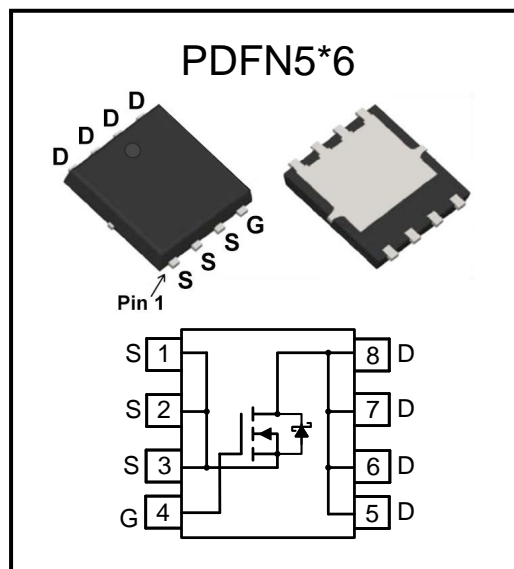
Features

- $V_{(BR)DSS}=45V$, $I_D=60A$
- $R_{DS(on)}@V_{GS}=10V$, TYP=4.0m Ω
- $R_{DS(on)}@V_{GS}=4.5V$, TYP=5.5m Ω
- Fast Switching
- Low Gate Charge
- Low Reverse transfer capacitances

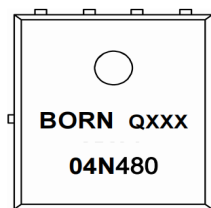
Applications

- Power switch circuit of adaptor and charger
- E-cigarette, Electric Tool

Package



Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BMO04N480	PDFN5*6	04N480	5K	Tape and reel

Absolute Maximum Ratings ($T_J=25^{\circ}C$ unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-Source Voltage		45	V
V_{GS}	Gate - Source Voltage		± 20	
I_D	Drain Current	$T_C=25^{\circ}C$	60	A
I_{DM}	Drain Current-Pulse ¹	$T_C=25^{\circ}C$	240	
E_{AS}	Avalanche Energy ²		125	mJ
P_D	Power Dissipation	$T_C=25^{\circ}C$	50	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55 to +150	$^{\circ}C$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		2.5	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		35	



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Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250uA	45	–	–	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 45V, V _{GS} =0V	–	–	1	uA
Gate- Source Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V	–	–	±100	nA
On Characteristics ³						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _{DS} =250uA	1.2	1.7	2.5	V
Static Drain-source On Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A	–	4.0	4.8	mΩ
		V _{GS} =4.5V, I _D =15A	–	5.5	7.5	
Dynamic Characteristics						
Gate Resistance	R _g	f = 1MHz	–	4	–	Ω
Input capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f = 1MHz	–	995	–	pF
Output capacitance	C _{oss}		–	600	–	
Reverse transfer capacitance	C _{rss}		–	23	–	
Switching Characteristics						
Turn-on delay time	T _{d(on)}	V _{DD} =20V, V _{GS} =10V, I _D =15A, R _G =3Ω	–	2.4	–	ns
Turn-on Rise time	T _r		–	12	–	
Turn -Off Delay Time	T _{d(off)}		–	17	–	
Turn -Off Fall time	T _f		–	12	–	
Gate to Source Charge	Q _{gs}	V _{DS} =20V, V _{GS} =10V, I _D =15A	–	3.1	–	nC
Gate to Drain Charge	Q _{gd}		–	2.0	–	
Gate to Drain Charge	Q _g		–	14.5	–	
Source - Drain Diode Characteristics ³						
Continuous Source Current	I _S	T _C =25° C	–	–	60	A
Maximum Pulsed Current	I _{SM}		–	–	240	
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =2A	–	–	1.2	V
Reverse Recovery Time	t _{rr}	I _F =15A, dI _F /dt=100A/us	–	30	–	ns
Reverse Recovery Charge	Q _{rr}		–	15	–	nC

Notes:

(1) Calculated continuous current based on maximum allowable junction temperature. Note that current limitations arising from heating of the device leads may occur with some lead mounting arrangements.

(2) $L=0.5\text{mH}$, $V_{DD}=20V$, Start $T_J=25^{\circ}\text{C}$.

(3) Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.



Typical Performance Characteristics

Figure 1: Typical Output Characteristics

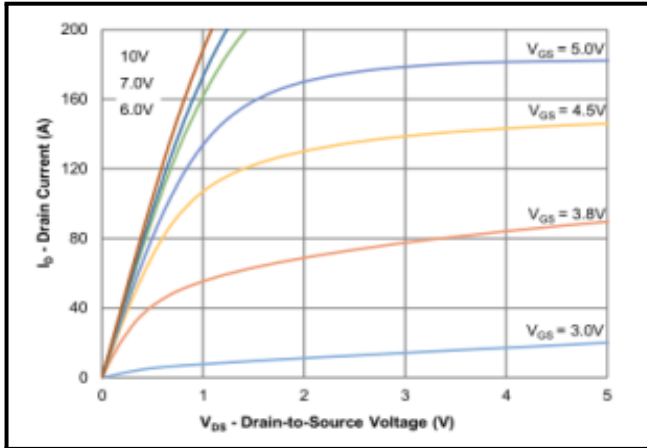


Figure 2: Typical Transfer Characteristics

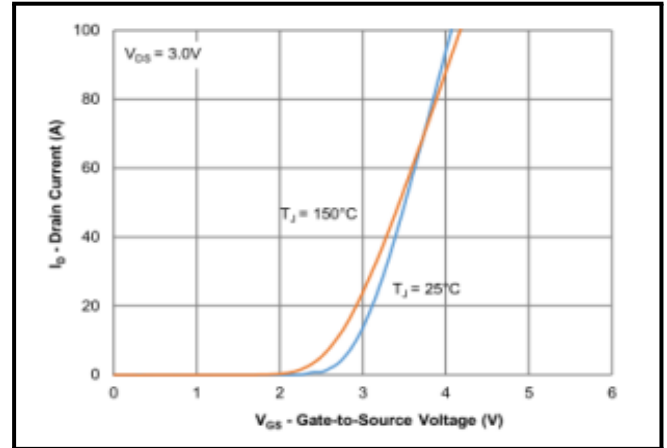


Figure 3: Typical Body Diode Transfer Characteristics

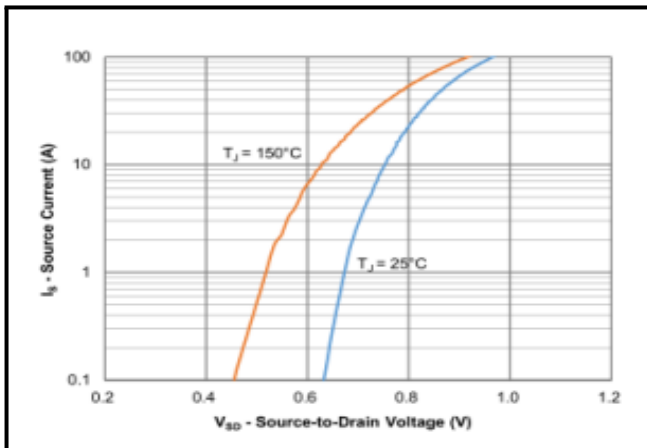


Figure 4: On-Resistance vs Drain Current

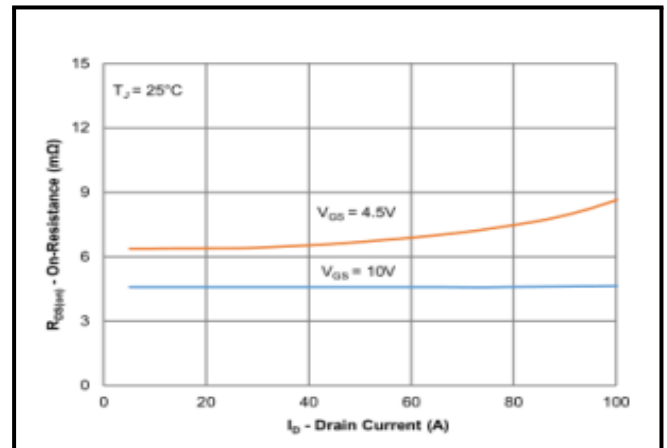


Figure 5: Normalized On Resistance vs Junction Temperature

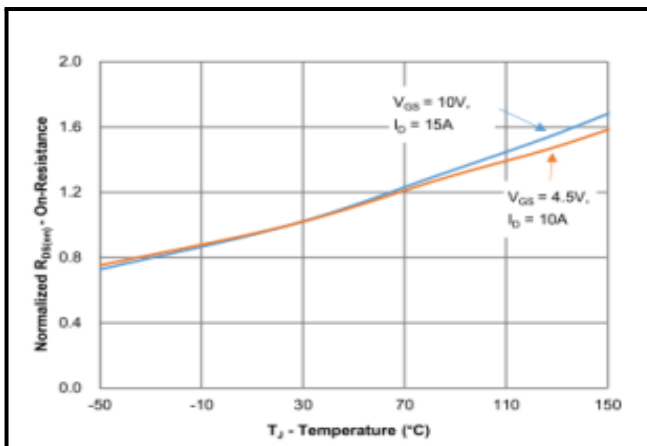
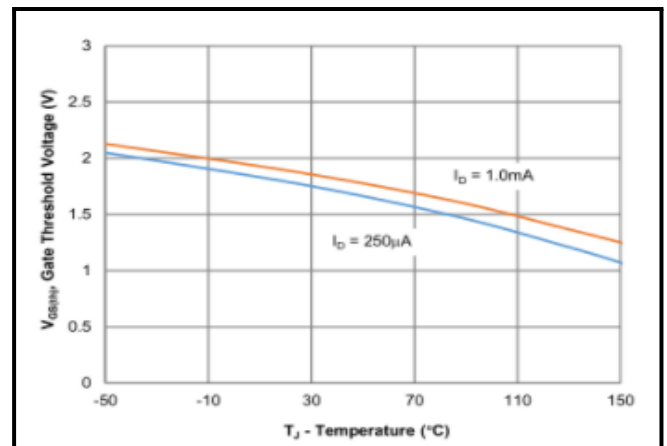


Figure 6: Normalized Threshold Voltage vs Junction Temperature



Typical Performance Characteristics

Figure 7: On Resistance vs Gate-Source Voltage

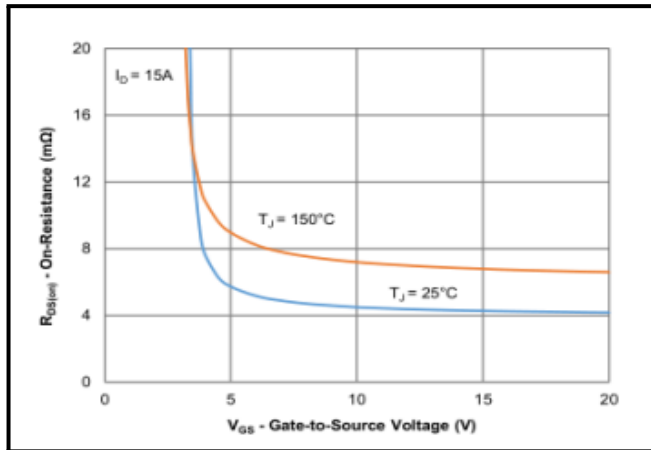


Figure 8: Capacitance Characteristics

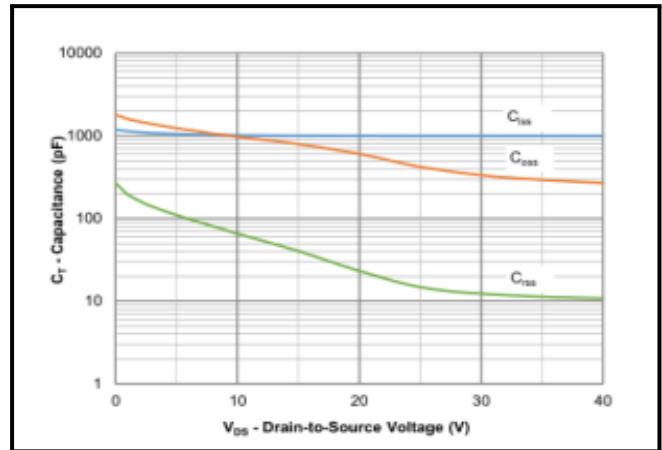


Figure 9: Typical Gate Charge vs Gate to Source Voltage

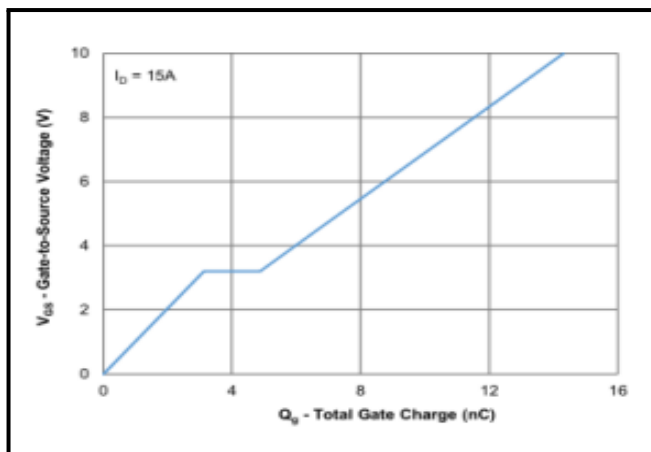
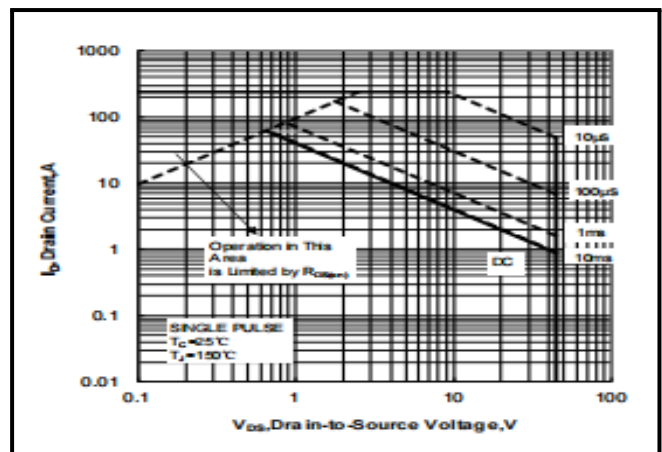


Figure 10: Maximum Safe Operating Area



Typical Performance Characteristics

Figure 11: Maximum Power Dissipation vs Case Temperature

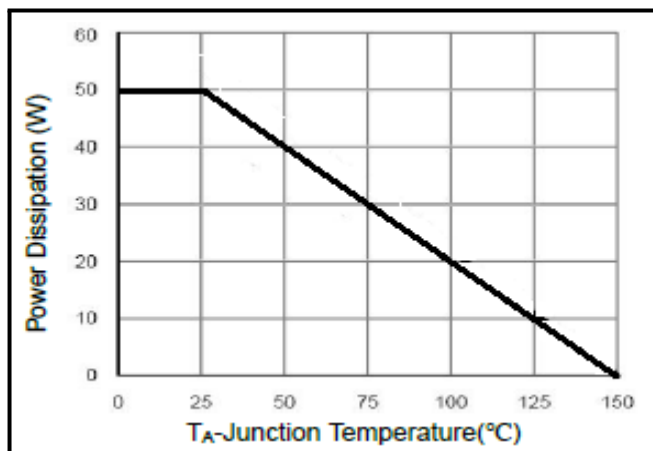


Figure 12: Maximum Continuous Drain Current vs Case Temperature

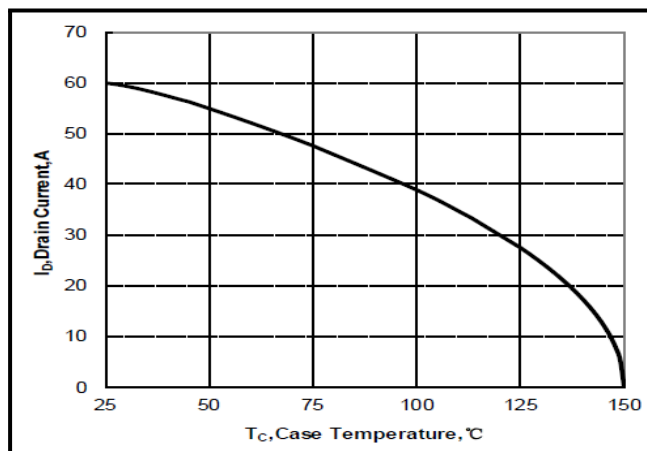
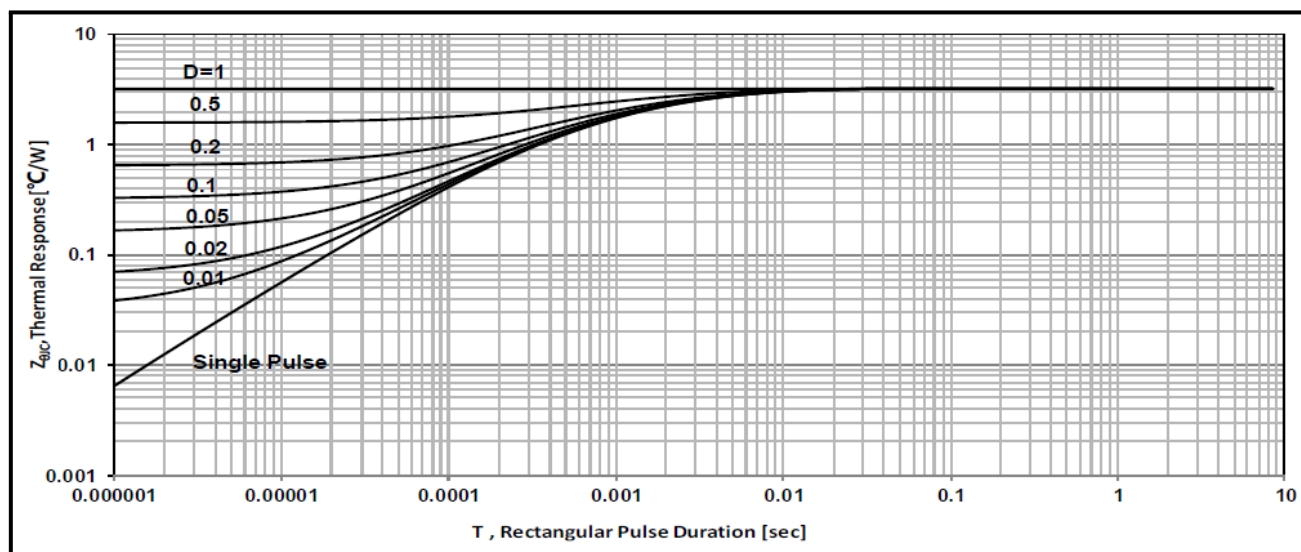


Figure 13: Maximum Effective Thermal Impedance, Junction to Case



Test Circuit and Waveform

Figure 14: Gate Charge Test Circuit and Waveforms

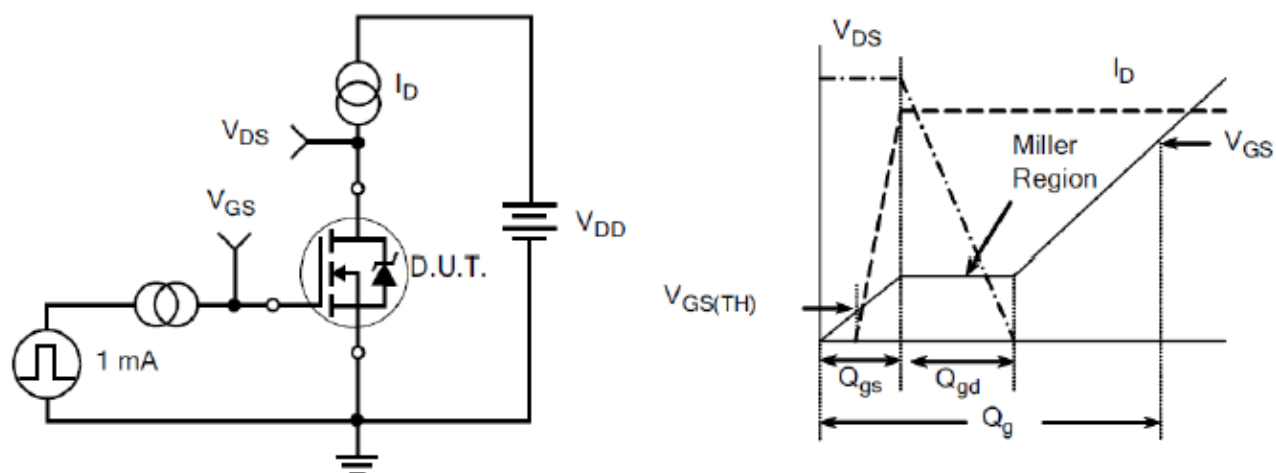
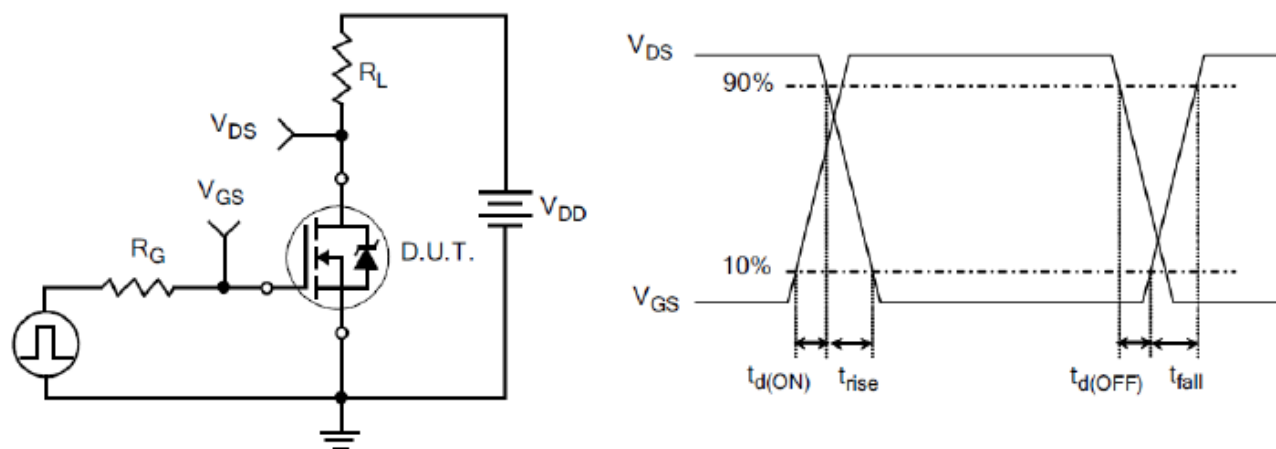


Figure 15: Resistive Switching Test Circuit and Waveforms



Test Circuit and Waveform

Figure 16: Diode Reverse Recovery Test Circuit and Waveforms

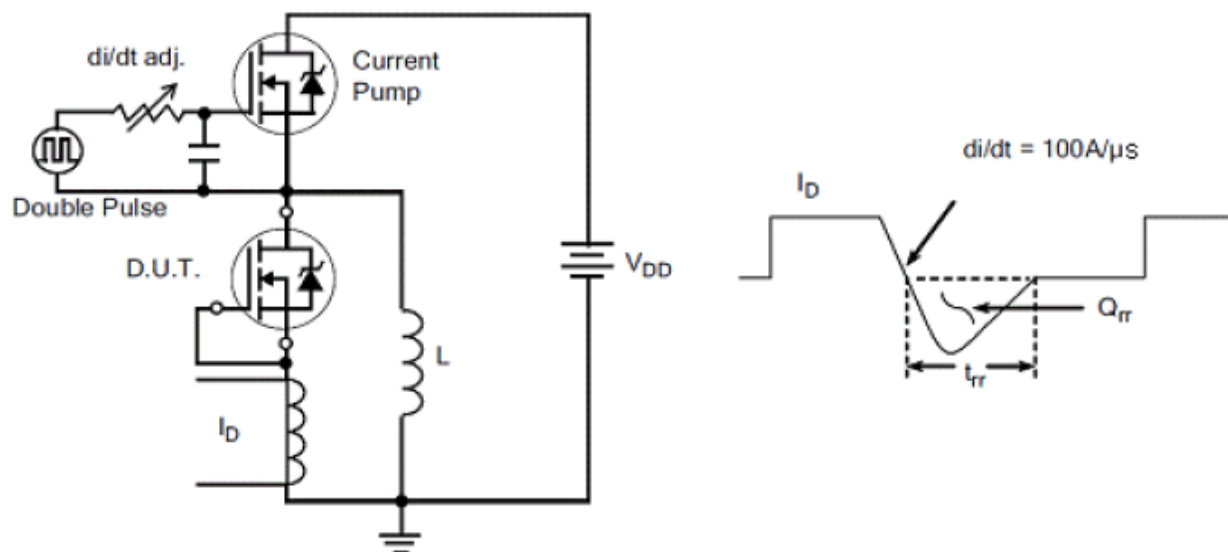
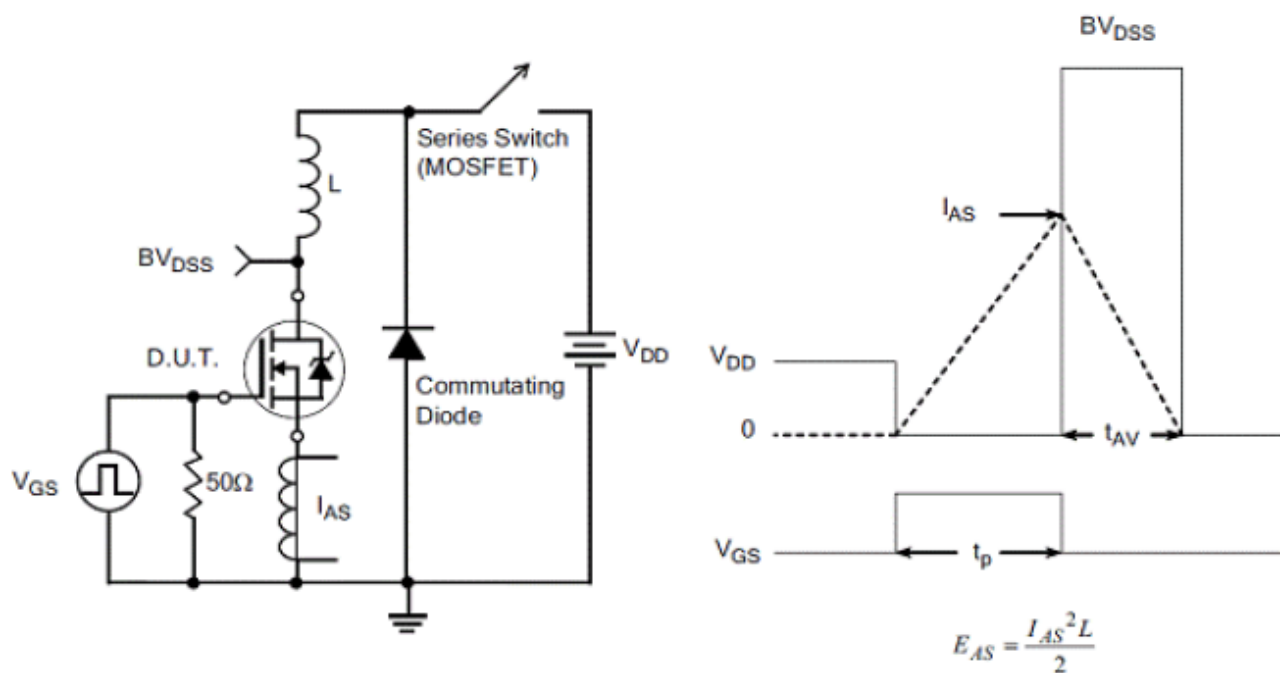
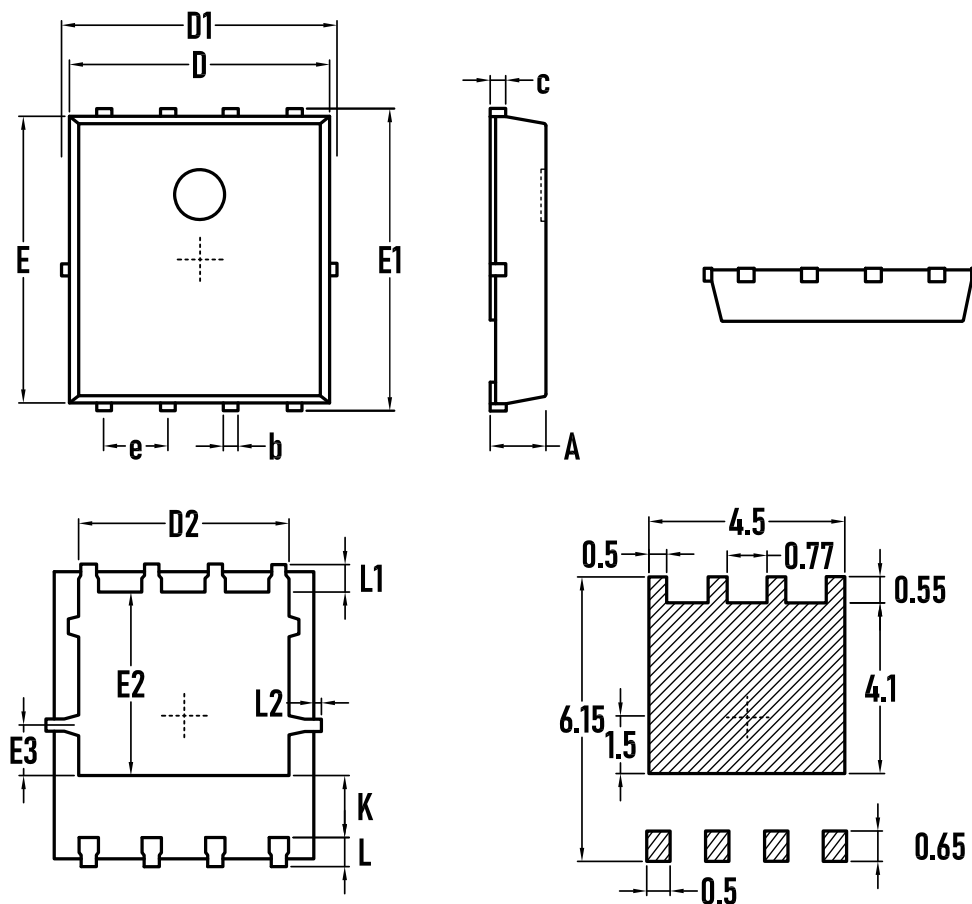


Figure 17: Unclamped Inductive Switching Test Circuit and Waveforms





SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.90	1.00	1.10
b	0.25	0.35	0.50
C	0.10	0.20	0.30
D	4.80	5.00	5.30
D1	4.90	5.10	5.50
D2	3.92	4.02	4.20
e	—	1.27	—
E	5.65	5.75	5.85
E1	5.90	6.05	6.20
E2	3.325	3.525	3.775
E3	0.80	0.90	1.00
K	1.00	1.30	1.50
L	0.40	0.55	0.70
L1	—	0.65	—
L2	—	—	0.15

