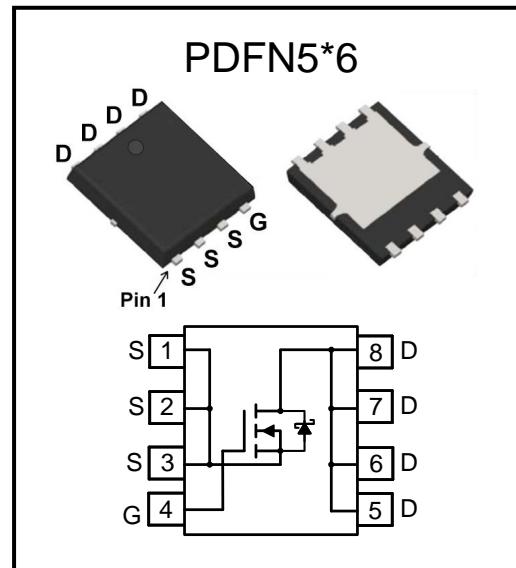


Features

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

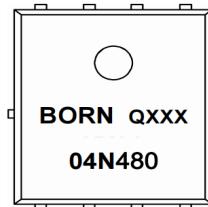
Package



Applications

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

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	°C
$R_{\Theta JC}$	Thermal Resistance, Junction-to-Case		2.5	°C/W
$R_{\Theta JA}$	Thermal Resistance, Junction-to-Ambient		35	



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}	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_D = 250\text{uA}$	45	—	—	V
Zero Gate Voltage Drain Current	I_{DSS}	$\text{V}_{\text{DS}} = 45\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$	—	—	1	uA
Gate- Source Leakage Current	I_{GSS}	$\text{V}_{\text{GS}} = \pm 20\text{V}$, $\text{V}_{\text{DS}} = 0\text{V}$	—	—	± 100	nA
On Characteristics³						
Gate Threshold Voltage	$\text{V}_{\text{GS(TH)}}$	$\text{V}_{\text{GS}} = \text{V}_{\text{DS}}$, $\text{I}_D = 250\text{uA}$	1.2	1.7	2.5	V
Static Drain-source On Resistance	$\text{R}_{\text{DS(on)}}$	$\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 20\text{A}$	—	4.0	4.8	$\text{m}\Omega$
		$\text{V}_{\text{GS}} = 4.5\text{V}$, $\text{I}_D = 15\text{A}$	—	5.5	7.5	
Dynamic Characteristics						
Gate Resistance	R_g	$f = 1\text{MHz}$	—	4	—	Ω
Input capacitance	C_{iss}	$\text{V}_{\text{DS}} = 20\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1\text{MHz}$	—	995	—	pF
Output capacitance	C_{oss}		—	600	—	
Reverse transfer capacitance	C_{rss}		—	23	—	
Switching Characteristics						
Turn-on delay time	$\text{T}_{\text{d(on)}}$	$\text{V}_{\text{DD}} = 20\text{V}$, $\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 15\text{A}$, $\text{R}_G = 3\Omega$	—	2.4	—	ns
Turn-on Rise time	T_r		—	12	—	
Turn -Off Delay Time	$\text{T}_{\text{d(off)}}$		—	17	—	
Turn -Off Fall time	T_f		—	12	—	
Gate to Source Charge	Q_{gs}	$\text{V}_{\text{DS}} = 20\text{V}$, $\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 15\text{A}$	—	3.1	—	nC
Gate to Drain Charge	Q_{gd}		—	2.0	—	
Gate to Drain Charge	Q_g		—	14.5	—	
Source - Drain Diode Characteristics³						
Continuous Source Current	I_s	$\text{T}_c = 25^\circ\text{C}$	—	—	60	A
Maximum Pulsed Current	I_{SM}		—	—	240	
Diode Forward Voltage	V_{SD}	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_s = 2\text{A}$	—	—	1.2	V
Reverse Recovery Time	t_{rr}	$\text{I}_F = 15\text{A}$, $d\text{I}_F/dt = 100\text{A}/\text{us}$	—	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) $L = 0.5\text{mH}$, $\text{V}_{\text{DD}} = 20\text{V}$, Start $\text{T}_J = 25^\circ\text{C}$.
- (3) Pulse test: pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.



Typical Performance Characteristics

Figure 1: Typical Output Characteristics

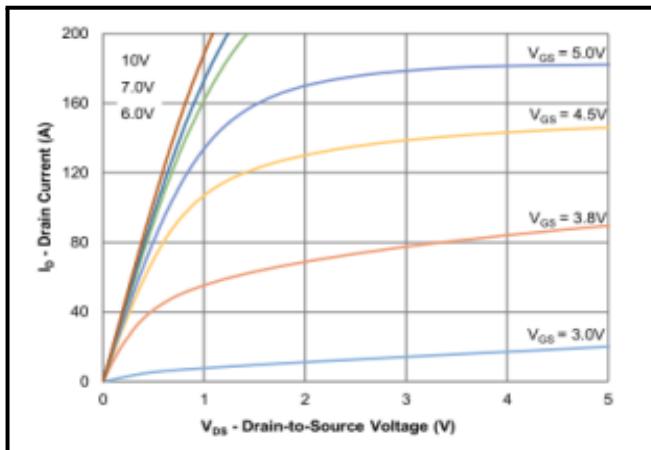


Figure 3: Typical Body Diode Transfer Characteristics

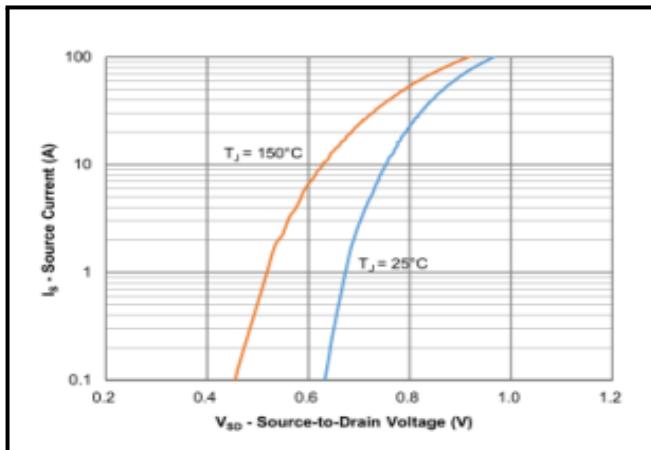


Figure 5: Normalized On Resistance vs Junction Temperature

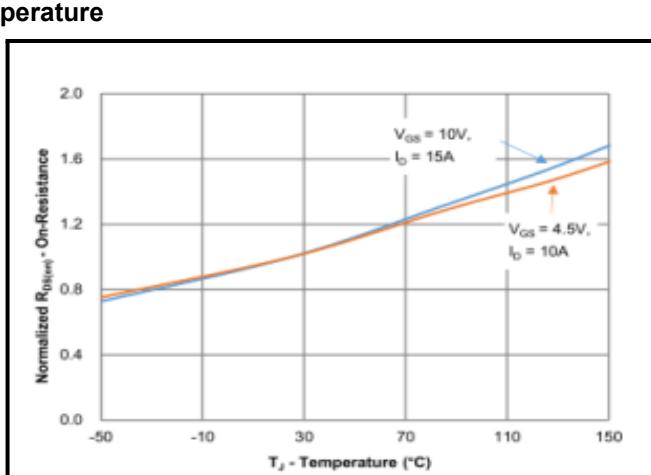


Figure 2: Typical Transfer Characteristics

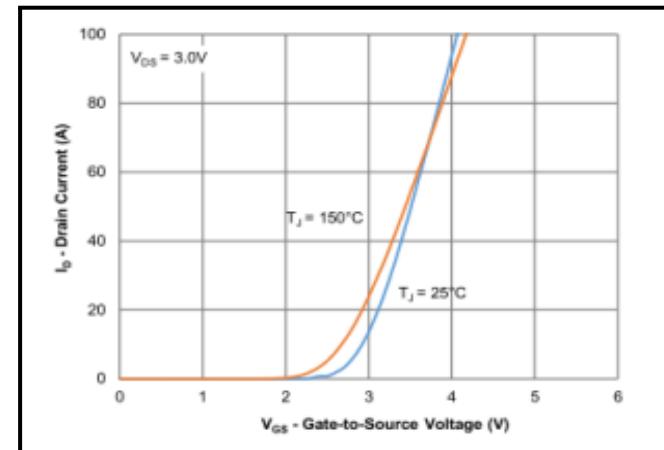


Figure 4: On-Resistance vs Drain Current

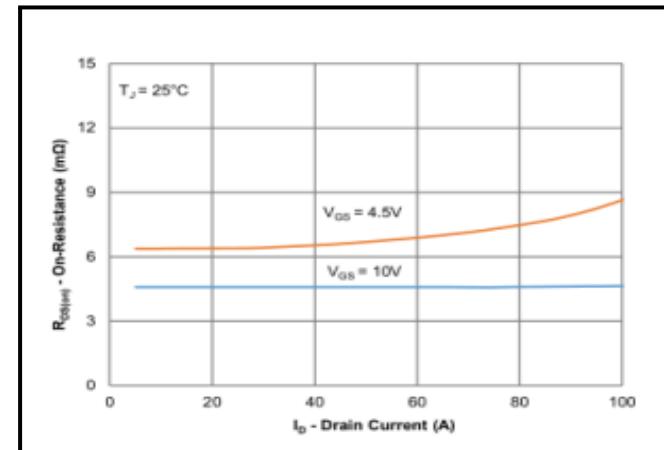
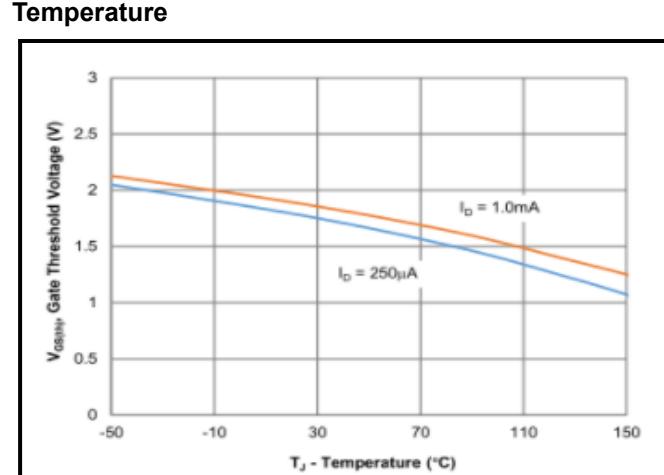


Figure 6: Normalized Threshold Voltage vs Junction Temperature



Typical Performance Characteristics

Figure 7: On Resistance vs Gate-Source Voltage

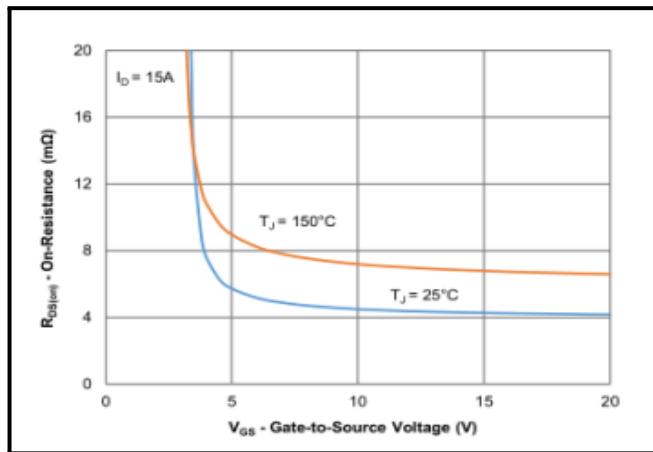


Figure 8: Capacitance Characteristics

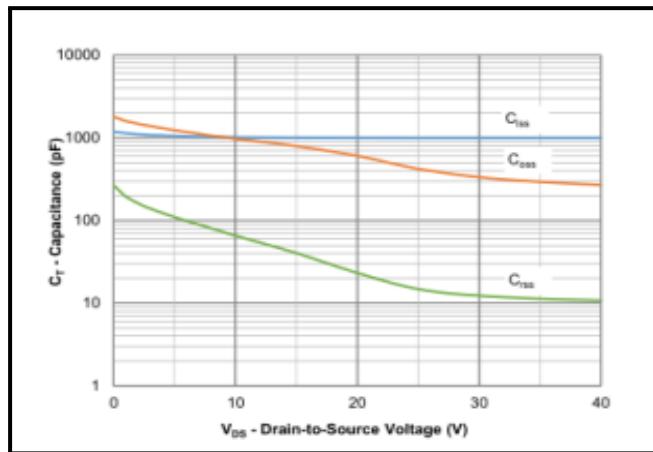


Figure 9: Typical Gate Charge vs Gate to Source Voltage

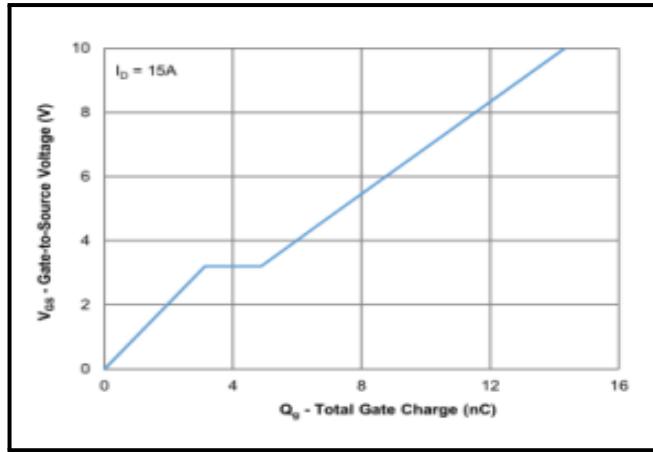
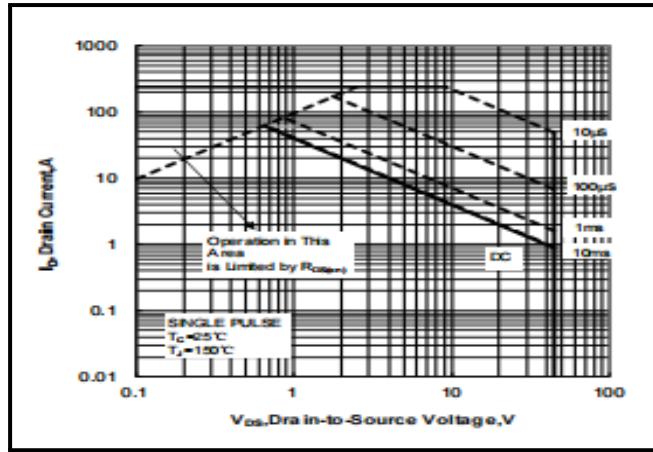


Figure 10: Maximum Safe Operating Area



Typical Performance Characteristics

Figure 11: Maximum Power Dissipation vs Case Temperature

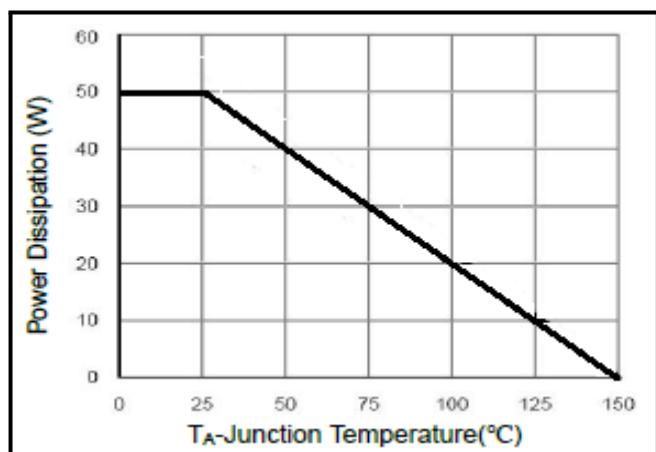


Figure 12: Maximum Continuous Drain Current vs Case Temperature

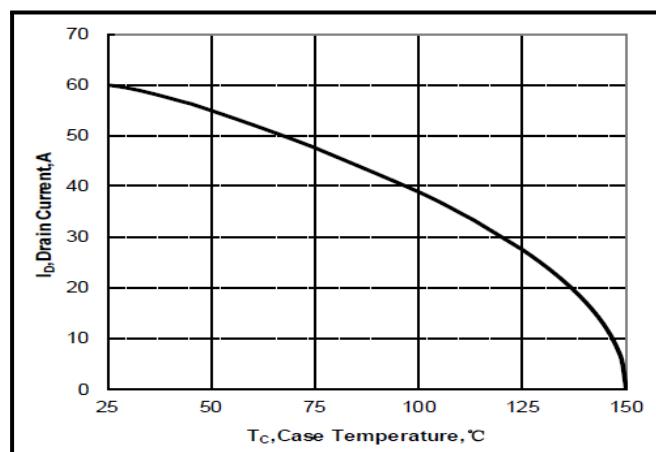
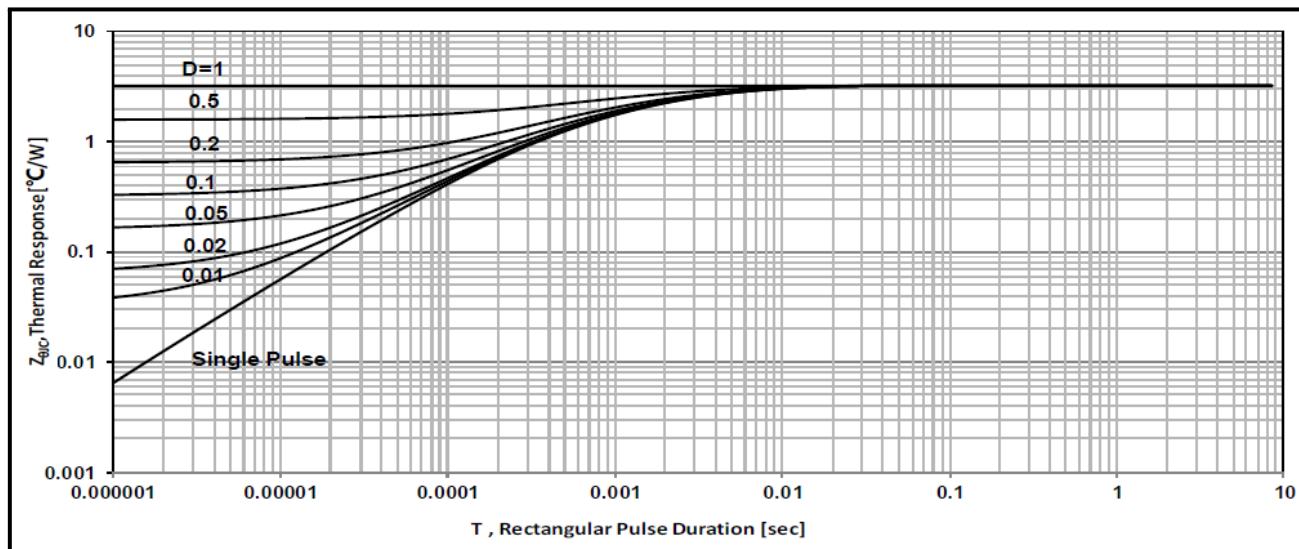


Figure 13: Maximum Effective Thermal Impedance, Junction to Case



Test Circuit and Waveform

Figure 14: Gate Charge Test Circuit and Waveforms

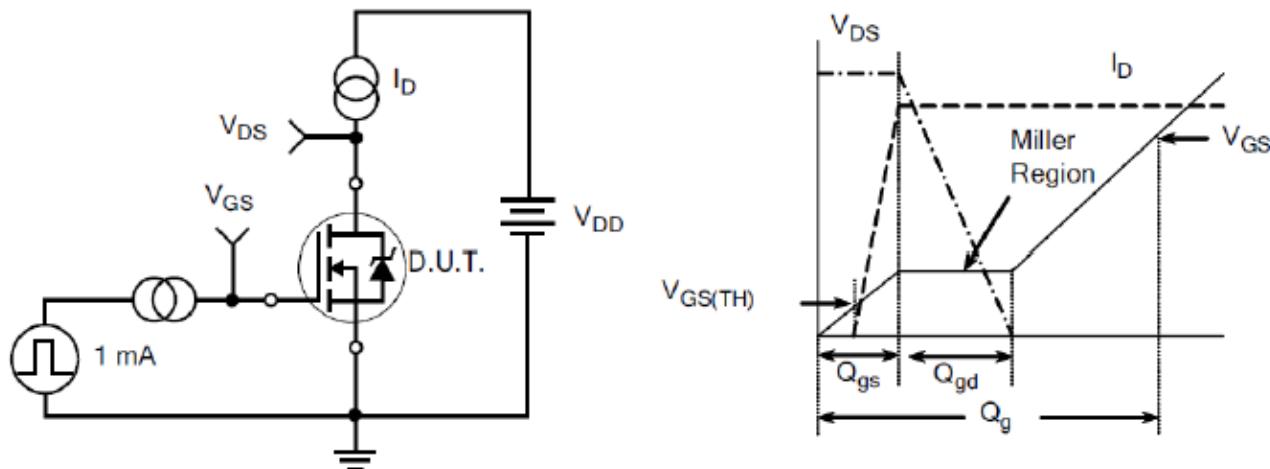
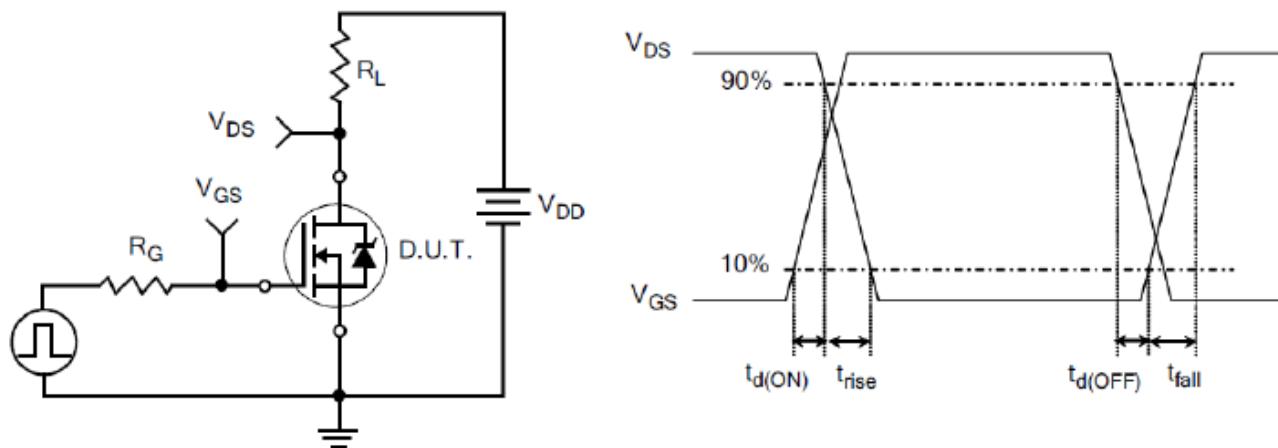


Figure 15: Resistive Switching Test Circuit and Waveforms



Test Circuit and Waveform

Figure 16: Diode Reverse Recovery Test Circuit and Waveforms

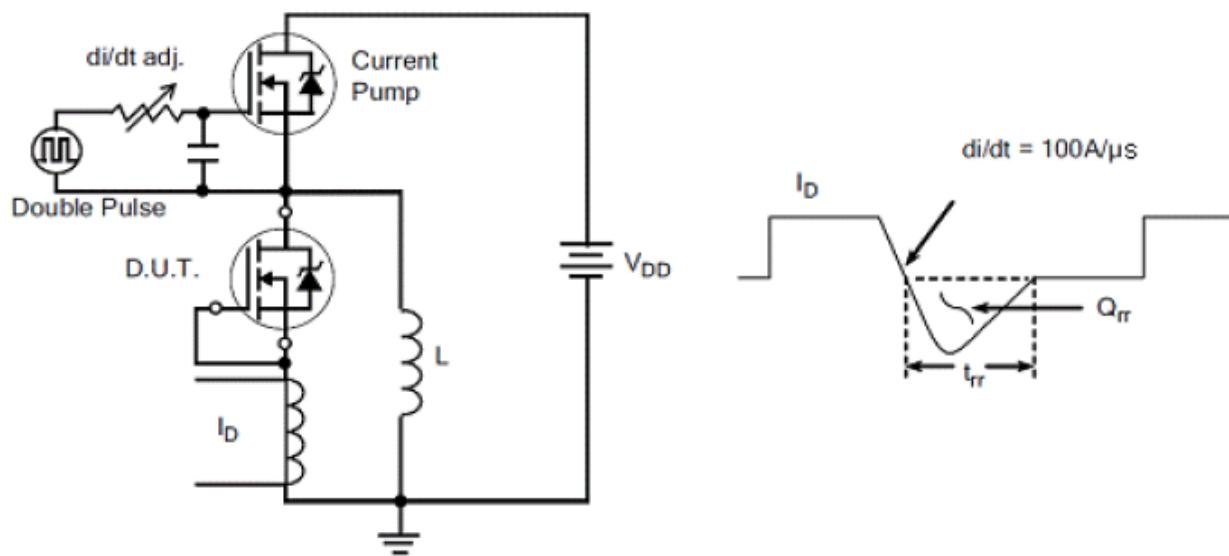
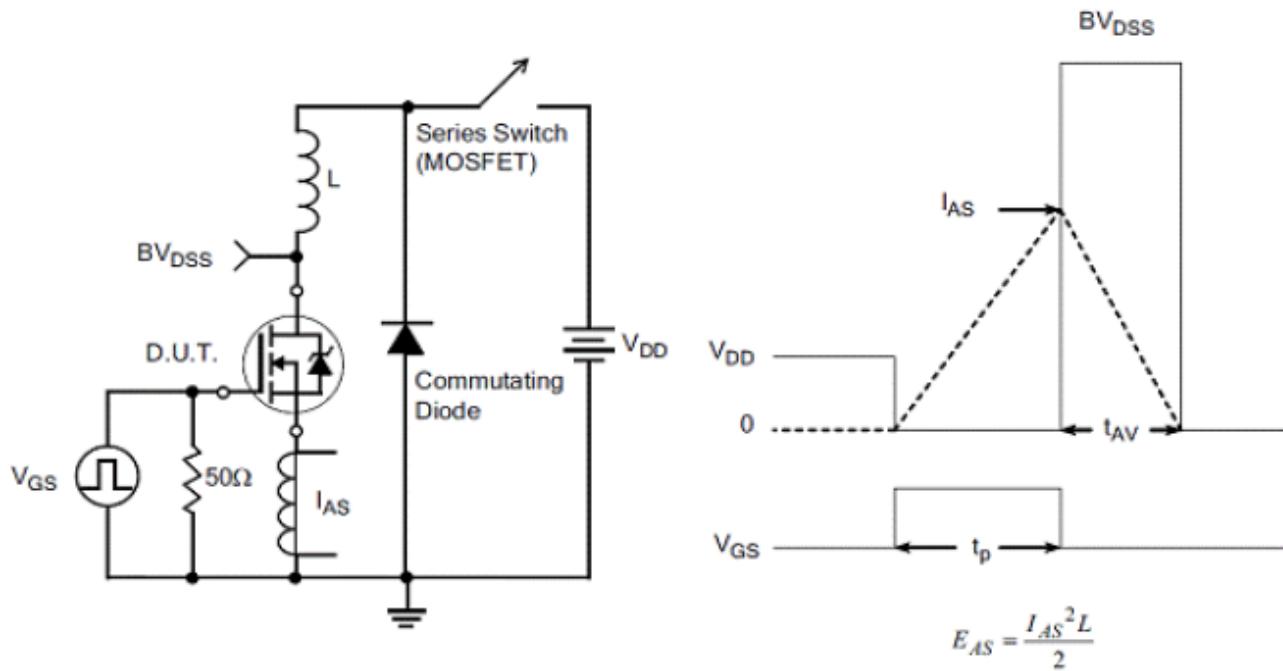
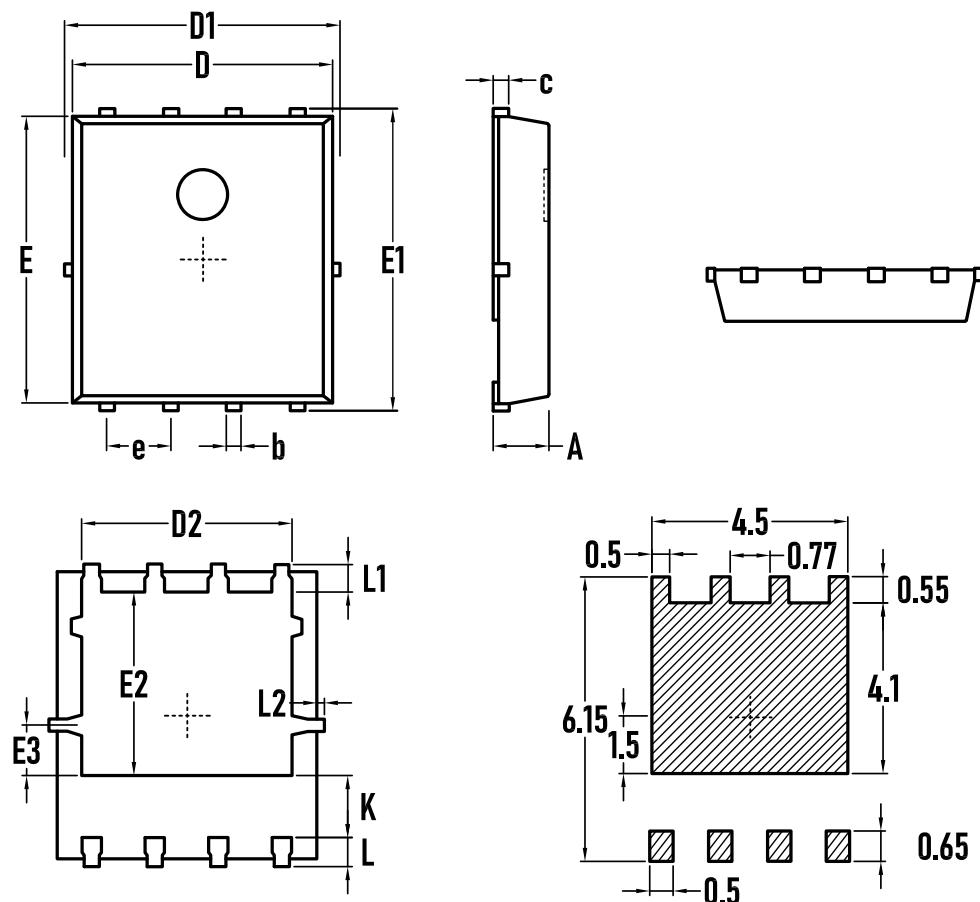


Figure 17: Unclamped Inductive Switching Test Circuit and Waveforms



Packaging Tape -PDFN5x6



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

