

Single N-Channel, 30V, 80A, Power MOSFET

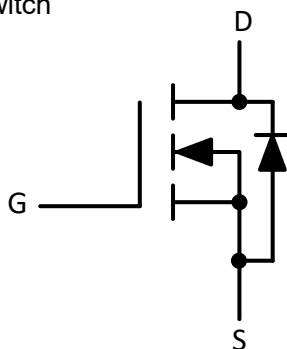
Features

- ✧ High density cell design for Low $R_{DS(on)}$
- ✧ Green device available
- ✧ Small package : PDFN3.3x3.3
- ✧ Low gate charge

V_{DS} (V)	Typical $R_{DS(on)}$ (m Ω)
30	4.2 @ $V_{GS}=4.5V$
	2.5 @ $V_{GS}=10V$

Applications

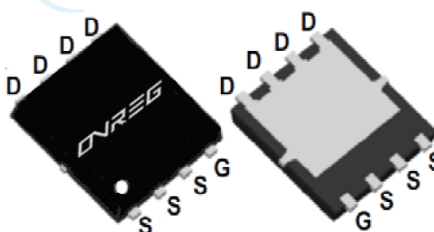
- ✧ High current load applications
- ✧ Load switch for portable devices
- ✧ Battery Switch



Circuit Diagram

Mechanical Data

- ✧ UL Flame Rating : UL94V-0
- ✧ RoHS/WEEE Compliant



PDFN3.3x3.3

Absolute Maximum Rating at $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Parameter		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C=25\text{ }^{\circ}\text{C}$	I_D	80	A
	$T_C=100\text{ }^{\circ}\text{C}$		52	
Power Dissipation	$T_C=25\text{ }^{\circ}\text{C}$	P_D	51.63	W
Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	2.42	$^{\circ}\text{C/W}$
Junction Temperature		T_J	150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55~ +150	$^{\circ}\text{C}$

Electrical Characteristics at $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 29.5 V, V _{GS} = 0 V			1	μA
I _{GSSF}	Gate Leakage Current, Forward	V _{GS} = 20 V, V _{DS} = 0 V			100	nA
I _{GSSR}	Gate Leakage Current, Reverse	V _{GS} = -20 V, V _{DS} = 0 V			-100	nA
On Characteristics						
V _{GS(TH)}	Gate Threshold voltage	V _{DS} = V _{GS} , I _D = 250 uA	1.1	1.6	2.1	V
R _{DS(On)}	Drain-Source on-state resistance	V _{GS} = 10 V, I _D = 30 A		2.5	3.5	mΩ
		V _{GS} = 4.5 V, I _D = 20 A		4.2	6.2	mΩ
Dynamic Characteristics						
C _{iss}	Input capacitance	VDS=15V, VGS=0V, F=1.0Mhz		3300		pF
C _{oss}	Output capacitance			480		pF
C _{rss}	Reverse transfer capacitance			433		pF
Switching Characteristics						
t _{d(on)}	Turn On Delay Time	VDD=15V, ID=30A, VGS=10V, RG=30Ohm (Note 3, 4)		4		ns
t _r	Rising Time			26		ns
t _{d(off)}	Turn Off Delay Time			58		ns
t _f	Fall Time			29		ns
Q _g	Total Gate Charge	VDD=15V, ID=30A, VGS=10V (Note 3, 4)		68.5		nC
Q _{gs}	Gate-Source Charge			9.6		nC
Q _{gd}	Gate-Drain Charge			12.4		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current				80	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current				320	A
V _{SD}	Diode Forward Voltage	V _{GS} = 0 V, I _S = 30 A			1.2	V
T _{rr}	Reverse recovery time	IF=20A, di/dt=100A/μS		20		ns
Q _{rr}	Reverse recovery charge			12		nC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $L = 0.5\text{ mH}, V_{DD} = 10\text{V}, V_{GS} = 10\text{ V}, R_G = 25\text{ }\Omega$, Starting $T_j = 25\text{ }^{\circ}\text{C}$
3. $I_{SD} \leq 30\text{A}, di/dt = 100\text{A}/\mu\text{s}, V_{DD} \leq BV_{DSS}$, Starting $T_j = 25\text{ }^{\circ}\text{C}$
4. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$
5. Essentially independent of operating temperature

Typical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Fig.1 Power Dissipation Derating Curve

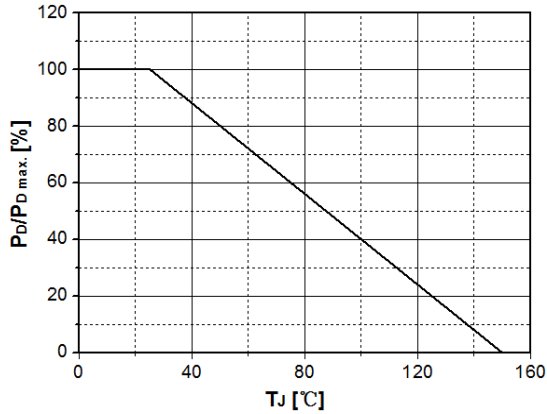


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

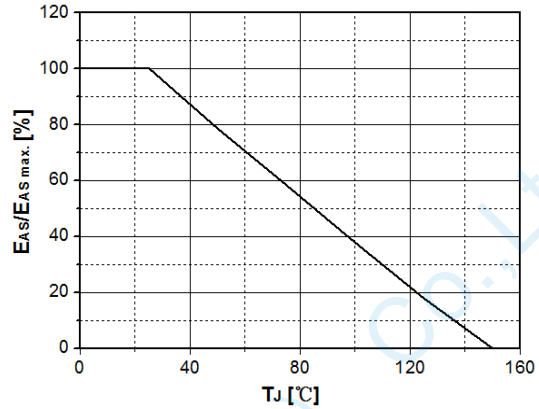


Fig.3 Typical Output Characteristics

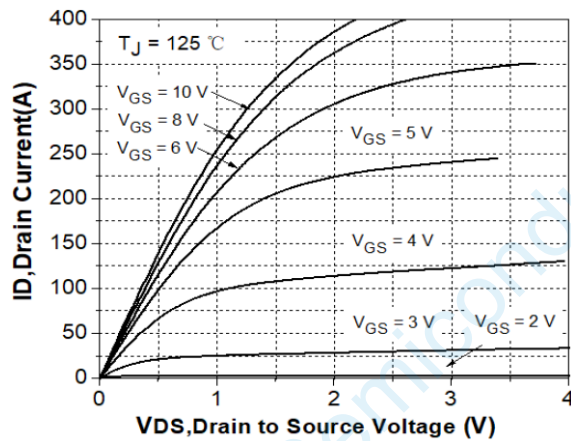


Fig. 4 Transconductance vs. Drain Current

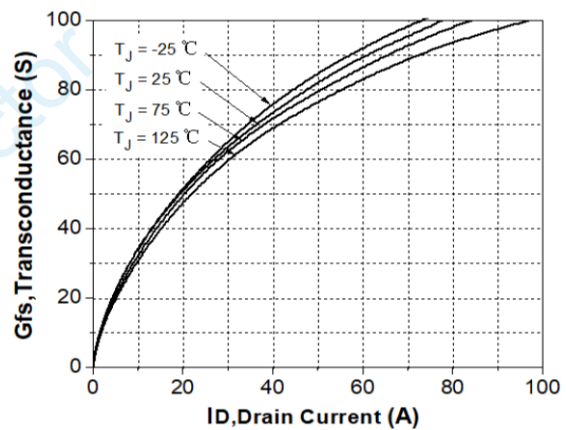


Fig.5 Typical Transfer Characteristics

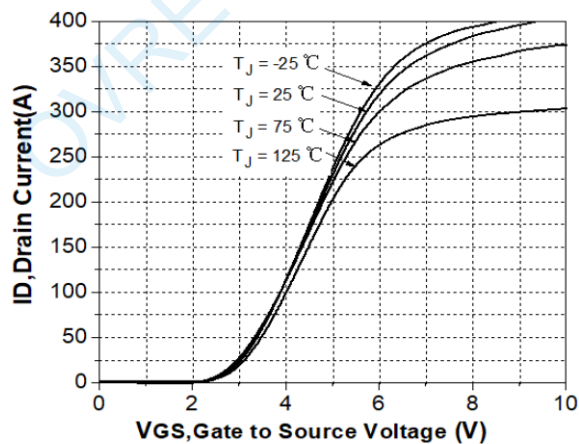
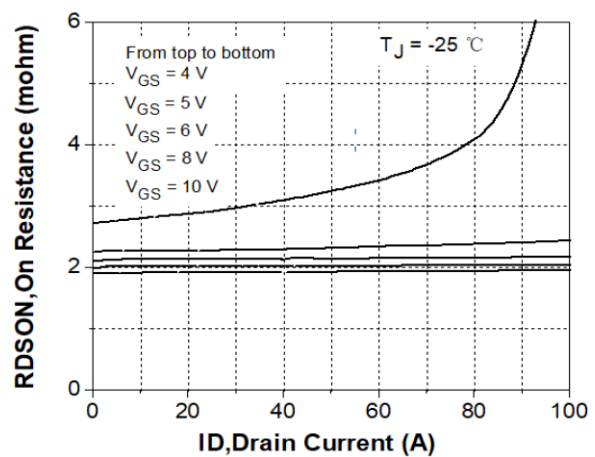


Fig. 6 State Resistance vs. Drain Current @-25°C



Typical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Fig.7 State Resistance vs. Drain Current @25°C

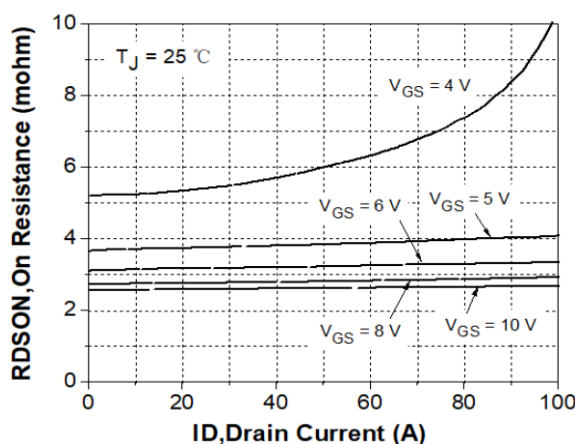


Fig. 8 State Resistance vs. Drain Current @125°C

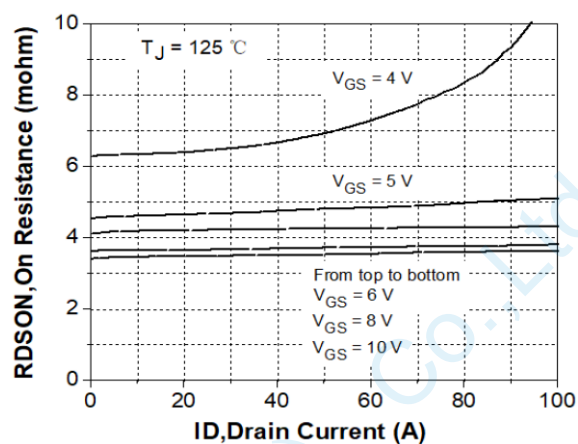


Fig.9 Typical Capacitance vs. Drain Source Voltage

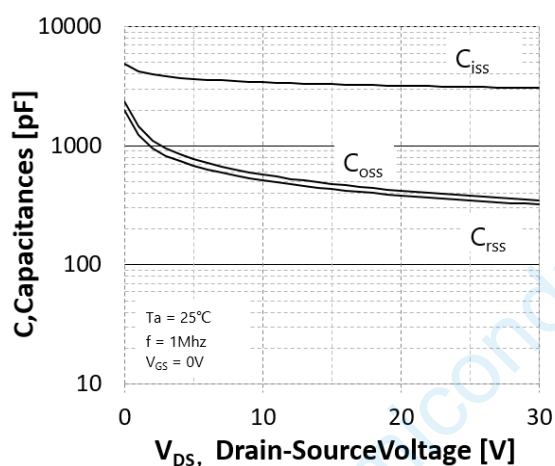


Fig.10 Dynamic Input Characteristics

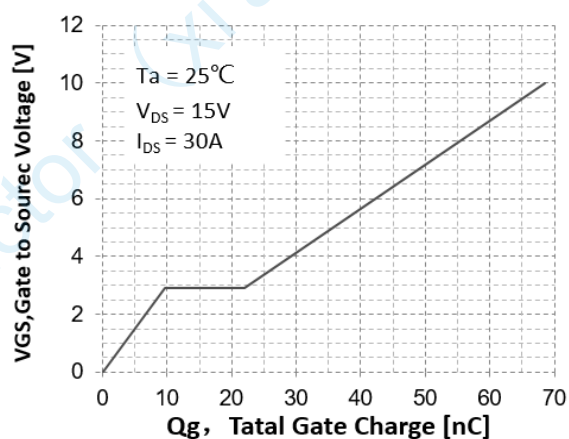


Fig.11 Breakdown Voltage vs. Junction Temperature

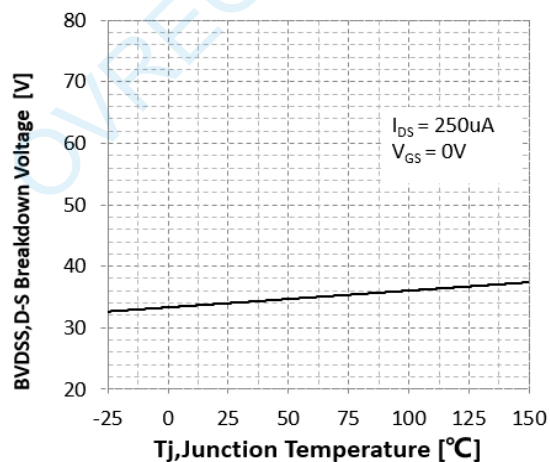
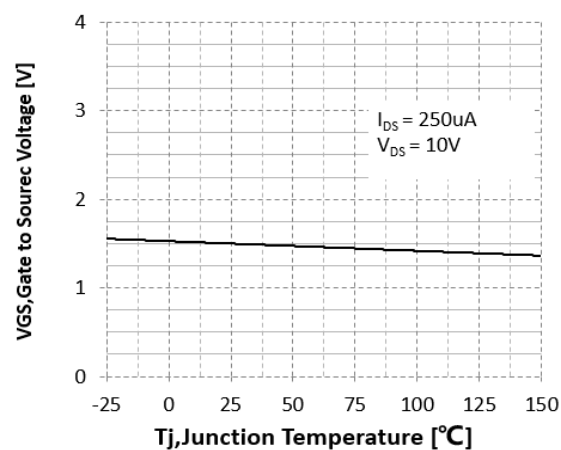


Fig. 12 Gate Threshold Voltage vs. Junction Temperature



Typical Characteristics at $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Fig.13 On-Resistance Variation vs. Junction Temperature

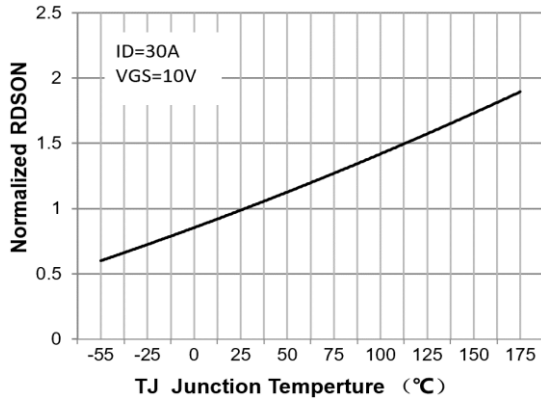


Fig.14 Maximum Drain Current vs. Case Temperature

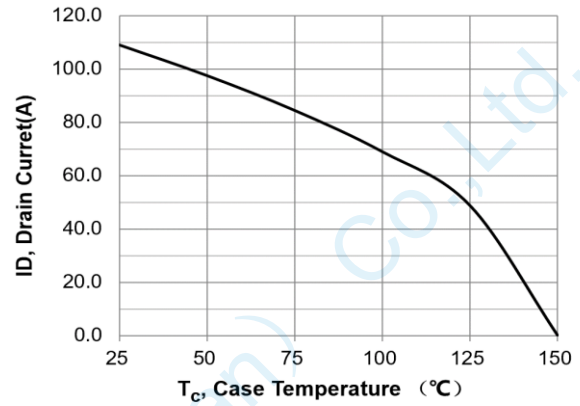
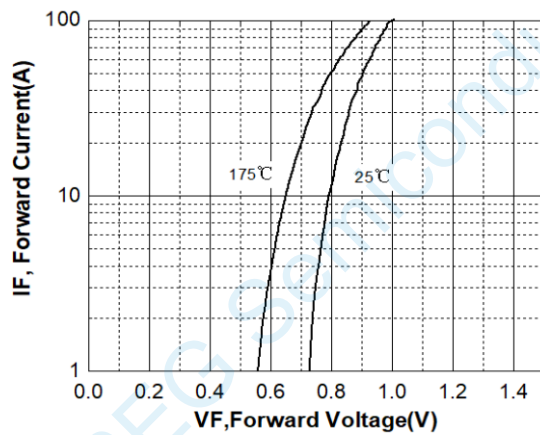


Fig.15 Body Diode Forward Voltage Vs Reverse Drain Current



Typical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Fig.16 Safe Operating Area

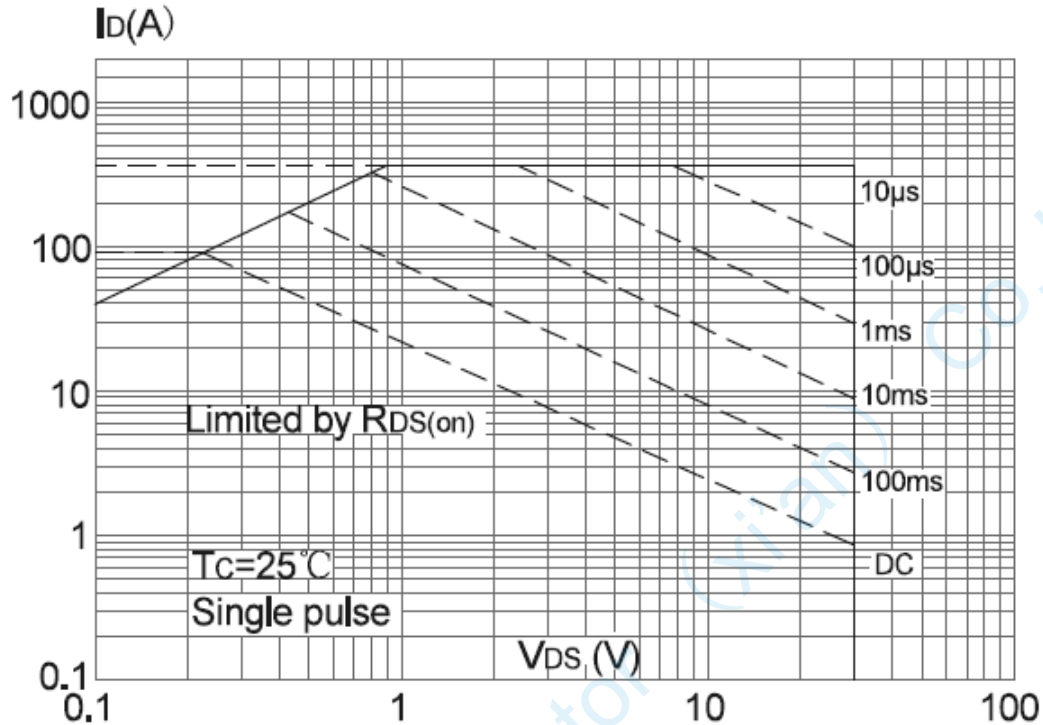
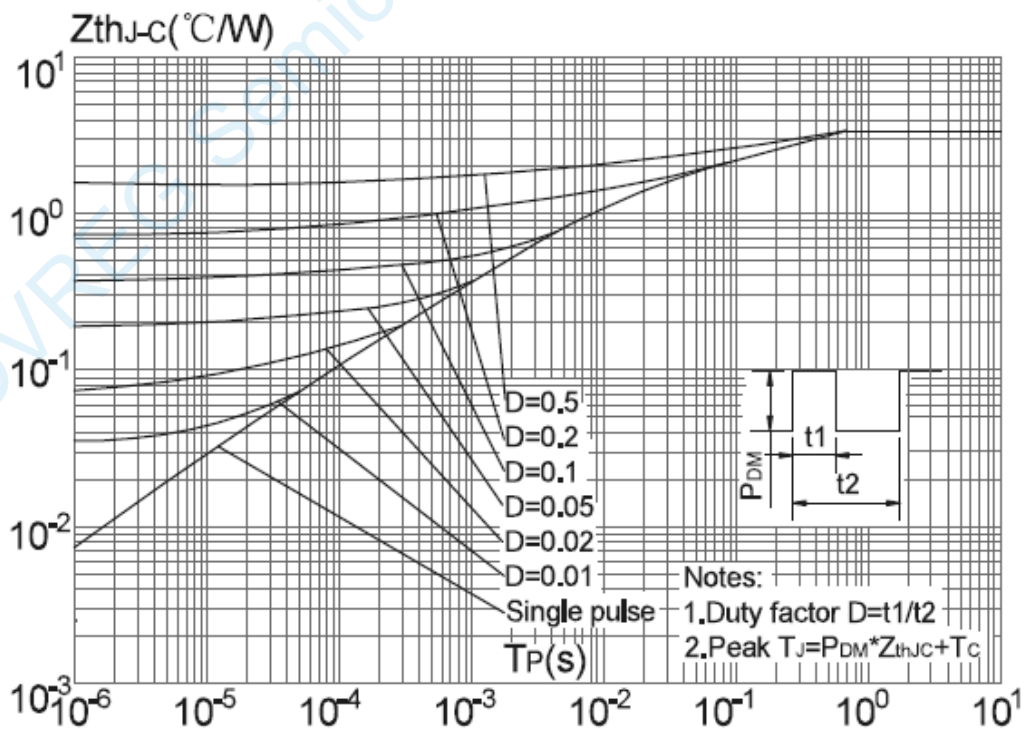
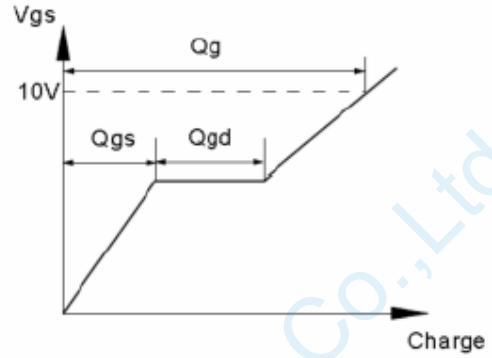
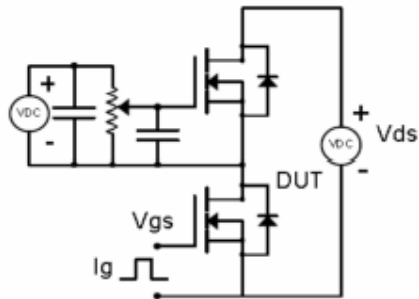


Fig. 17 Transient Thermal Response Curve

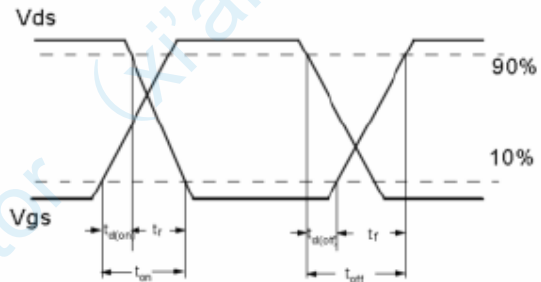
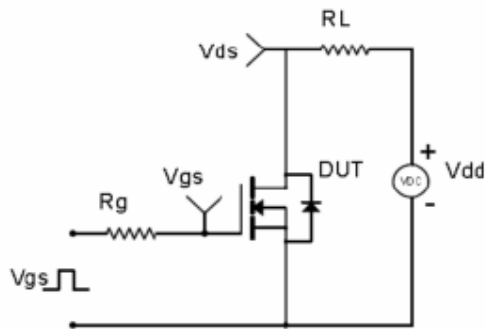


TEST CIRCUIT

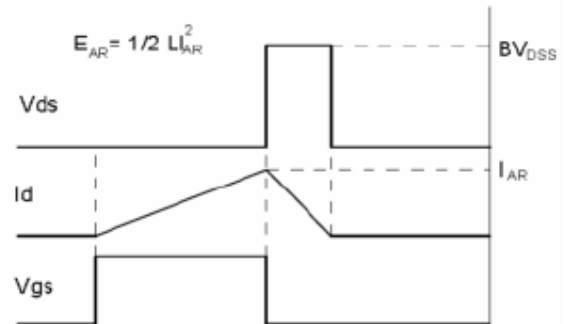
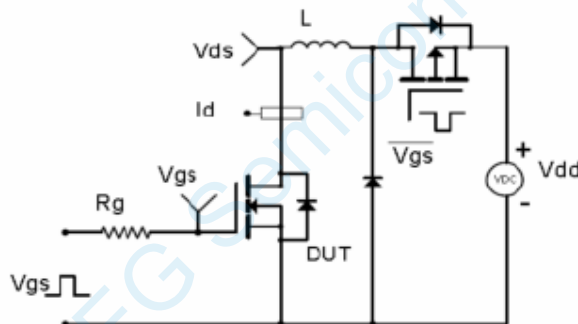
Gate Charge Test Circuit & Waveform



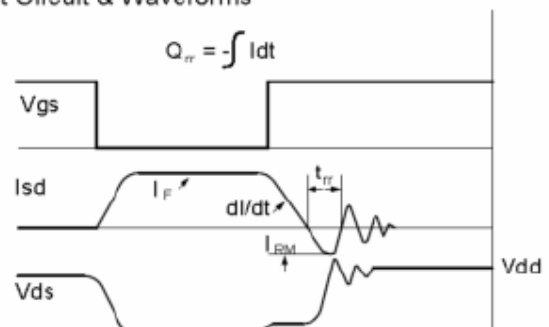
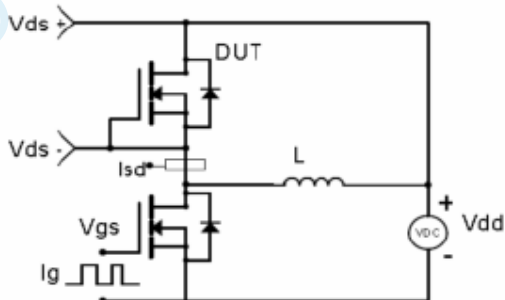
Resistive Switching Test Circuit & Waveforms



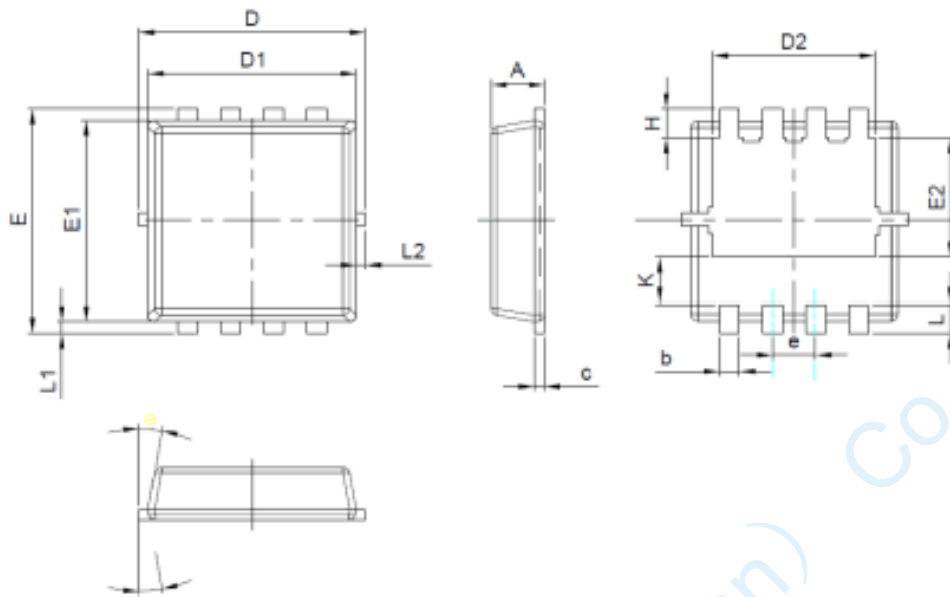
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



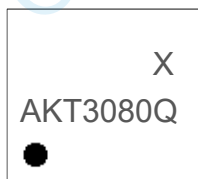
Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE = MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.80	0.90
b	0.25	0.30	0.39
c	0.14	0.15	0.25
D	3.20	3.30	3.40
D1	3.00	3.15	3.30
D2	2.35	2.45	2.55
e	0.65 BSC		
E	3.25	3.35	3.45
E1	2.85	3.00	3.15
E2	1.635	1.735	1.835
H	0.33	0.48	0.63
K	0.585	0.685	0.785
L	0.30	0.40	0.50
L1	0.05	0.15	0.25
L2	-	-	0.15
θ	8°	10°	12°

Marking



X: DATE CODE

Ordering Information

Part number	Material	Type	Reel size	MOQ
OVM30N03D3	GREEN	T/R	13 inch	5k/reel