Single N-Channel, 30V, 35A, Power MOSFET

Features

- ✧ High density cell design for Low $R_{DS(on)}$
- ✧ Green device available
- ✧ Small package : PDFN5x6
- ✧ Low gate charge

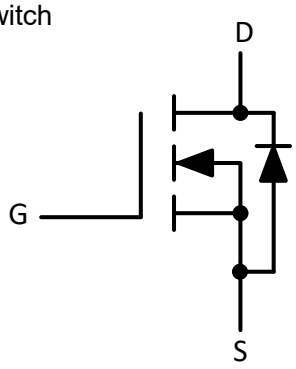
V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)
30	10 @ V_{GS}=4.5V
	6.5 @ V_{GS}=10V

Applications

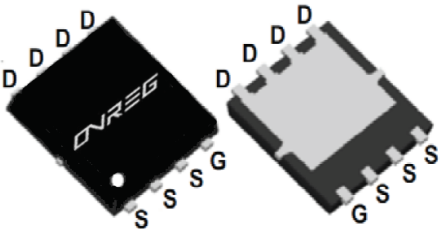
- ✧ High current load applications
- ✧ Load switch for portable devices
- ✧ Battery Switch

Mechanical Data

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



Circuit Diagram



PDFN5x6

Absolute Maximum Rating at T_A = 25 °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 ℃	I_D	35	A
	T_C=100℃		22	
Power Dissipation	T_C=25 ℃	P_D	39	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	49.1	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature		T_{STG}	-55~ +150	℃

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Electrical Characteristics at T_A = 25 °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} =29.5V, 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	1.5	2.0	V
$R_{DS(On)}$	Drain-Source on-state resistance	V_{GS} = 10 V, I_D = 25 A		6.5	8	mΩ
		V_{GS} = 4.5 V, I_D = 15 A		10	13.5	mΩ
g_{FS}	Forward Transconductance	V_{DS} = 5 V, I_D = 20 A	12			S
Dynamic Characteristics						
C_{iss}	Input capacitance	V_{DS} =15V, V_{GS} =0V, F=1.0Mhz		1070		pF
C_{oss}	Output capacitance			161		pF
C_{rss}	Reverse transfer capacitance			135		pF
Switching Characteristics						
$t_{d(on)}$	Turn On Delay Time	V_{DS} =15V, I_D =15A, V_{GS} =10V, RG=3Ω (Note 3, 4)		3		ns
t_r	Rising Time			4		ns
$t_{d(off)}$	Turn Off Delay Time			25		ns
t_f	Fall Time			14		ns
Q_g	Total Gate Charge	V_{DS} =15V, I_D=15A, V_{GS}=10V (Note 3, 4)		18.3		nC
Q_{gs}	Gate-Source Charge			2.5		nC
Q_{gd}	Gate-Drain Charge			2.1		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current				35	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current				140	A
V_{SD}	Diode Forward Voltage	V_{GS}= 0 V, I_S = 30 A			1.2	V
t_{rr}	Body Diode Reverse Recovery Time	V_{DS} =15V,I_F=30A, dI/dt=100A/μs		13		ns
Q_{rr}	Body Diode Reverse Recovery Charge			5		nC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L = 0.5 mH, V_{DD} = 20V, V_{GS} =10V, R_G = 25 Ω, Starting T_j = 25°C
3. I_{SD} ≤ IMax, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_j =25°C
4. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%
5. Essentially independent of operating temperature

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Typical Characteristics at T_A = 25 °C, unless otherwise specified

Fig.1 Power Dissipation Derating Curve

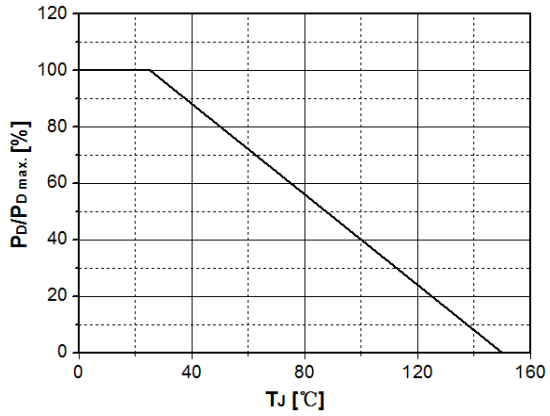


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

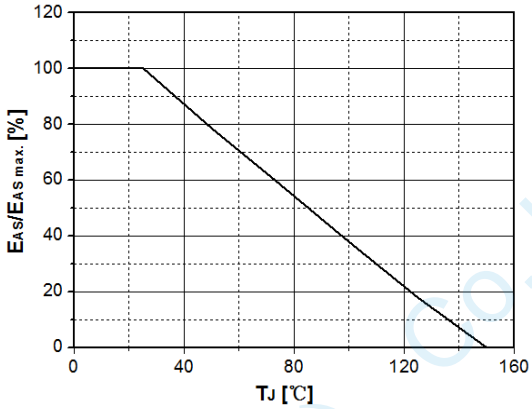


Fig.3 Typical Output Characteristics

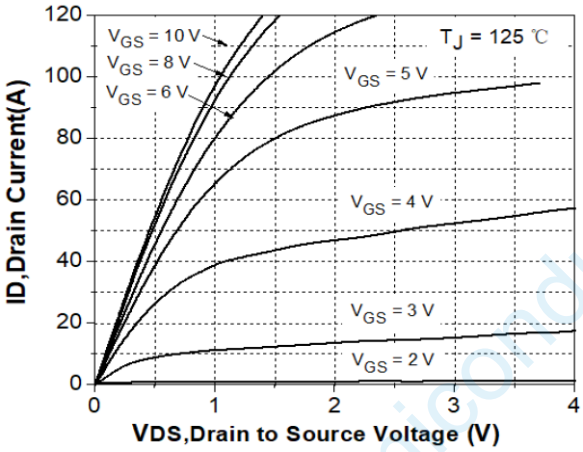


Fig. 4 Transconductance vs. Drain Current

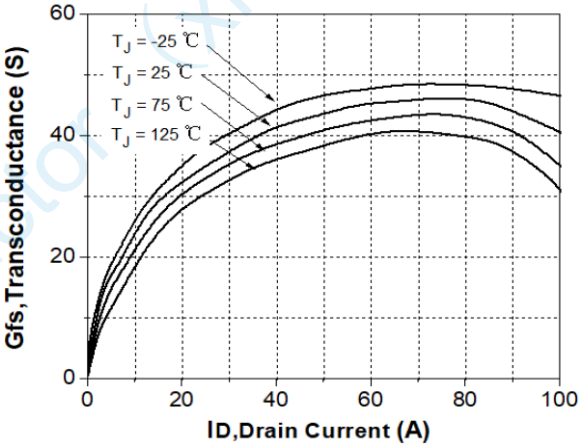


Fig.5 Typical Transfer Characteristics

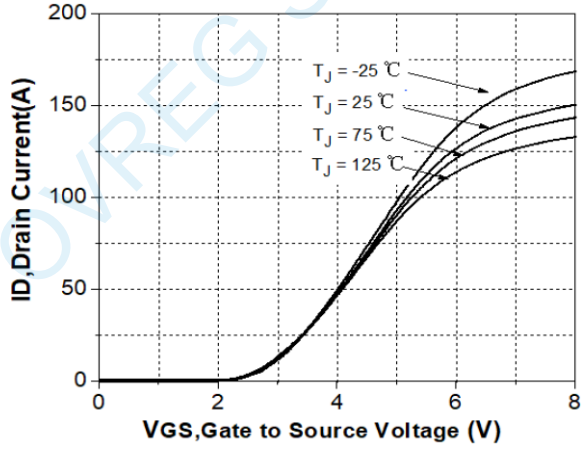
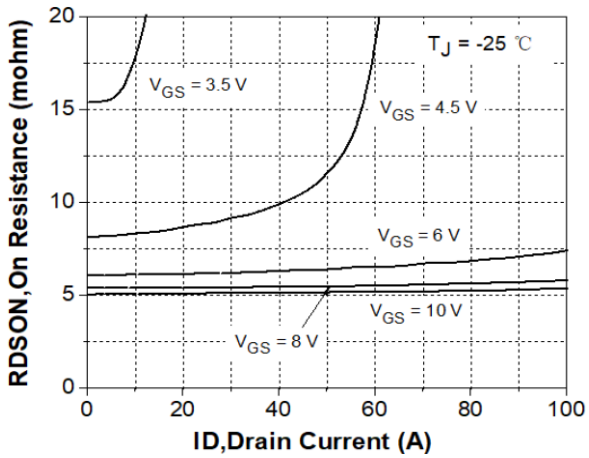


Fig. 6 State Resistance vs. Drain Current @-25℃



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Typical Characteristics at T_A = 25 °C, unless otherwise specified

Fig.7 State Resistance vs. Drain Current @25℃

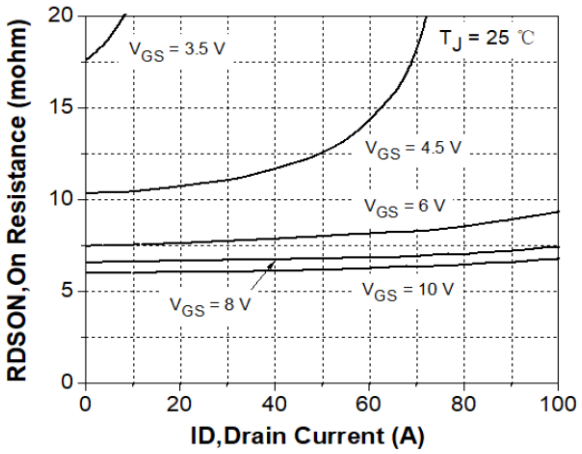


Fig. 8 State Resistance vs. Drain Current @125℃

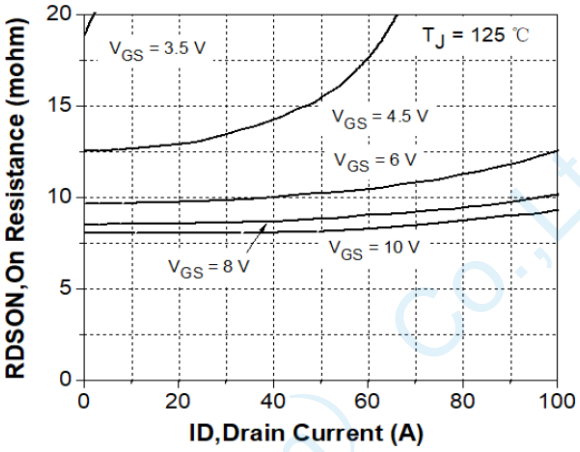


Fig.9 Typical Capacitance vs. Drain Source Voltage

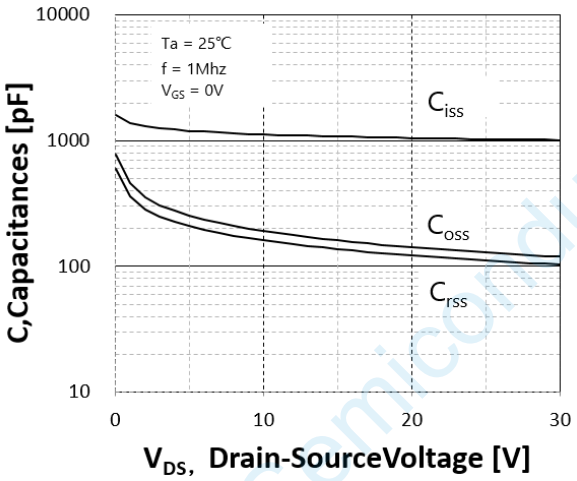


Fig.10 Dynamic Input Characteristics

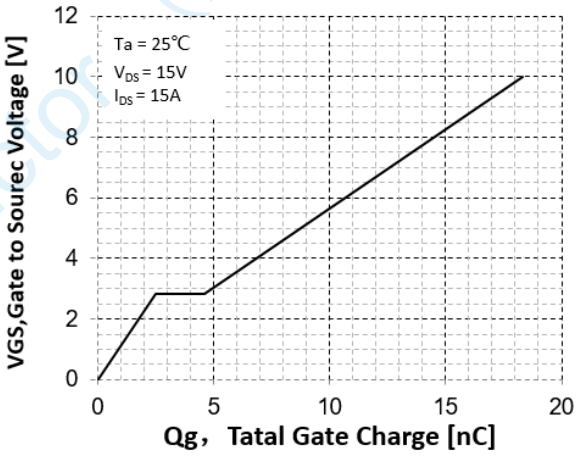


Fig.11 Breakdown Voltage
vs. Junction Temperature

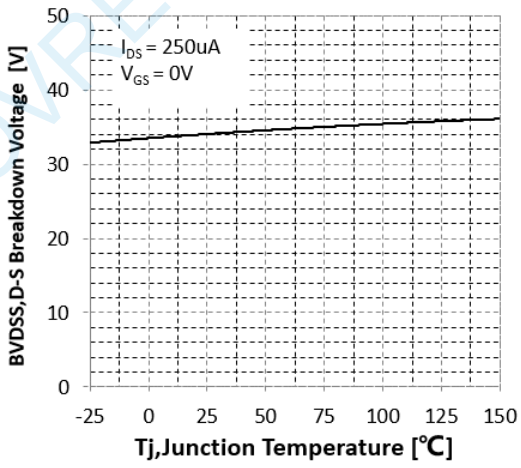
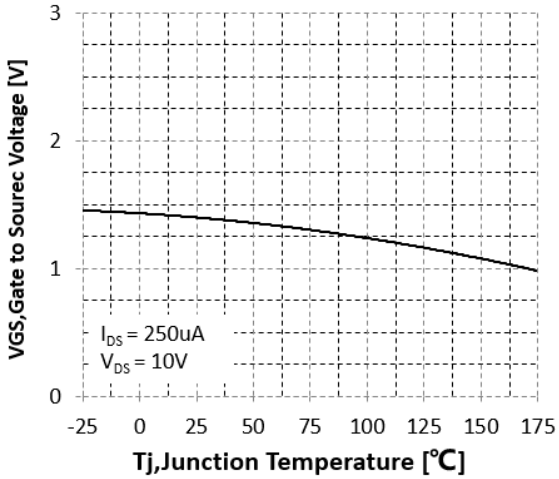


Fig. 12 Gate Threshold Voltage
vs. Junction Temperature



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Typical Characteristics at T_A = 25 °C, unless otherwise specified

Fig.13 On-Resistance Variation vs. Junction Temperature

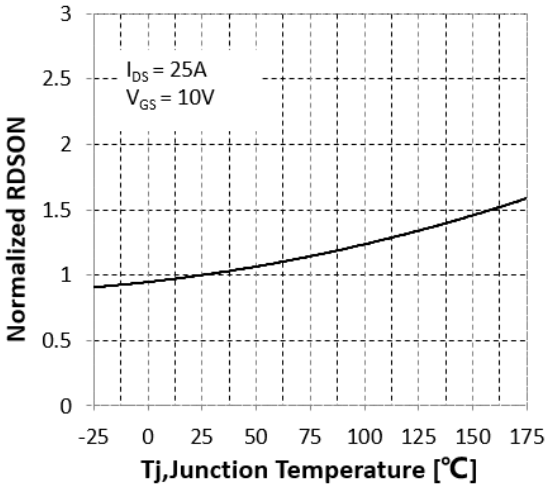


Fig.14 Maximum Drain Current vs. Case Temperature

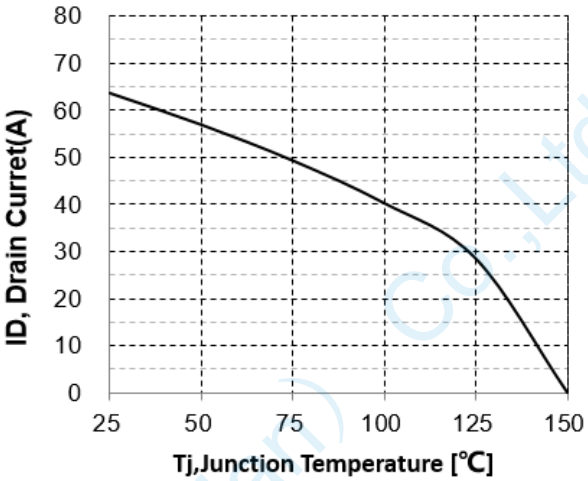
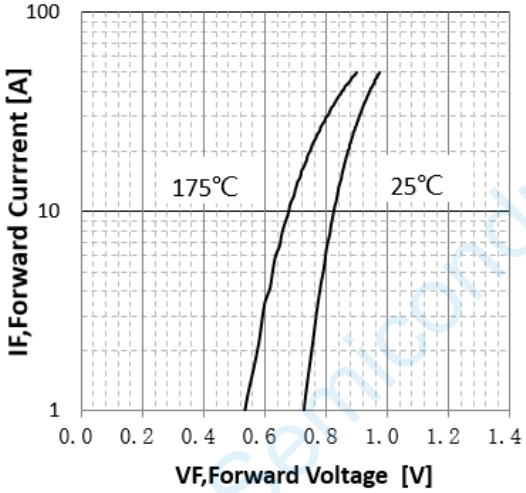


Fig.15 Body Diode Forward Voltage Vs Reverse Drain Current



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Typical Characteristics at TA = 25 °C, unless otherwise specified

Fig.16 Safe Operating Area

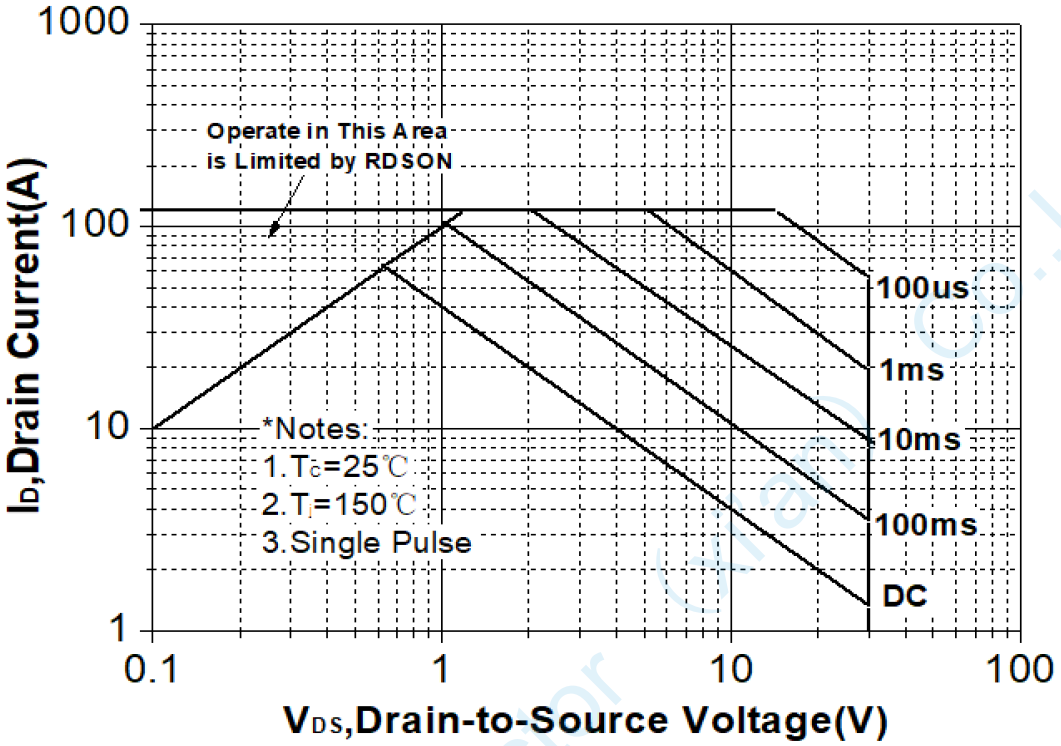
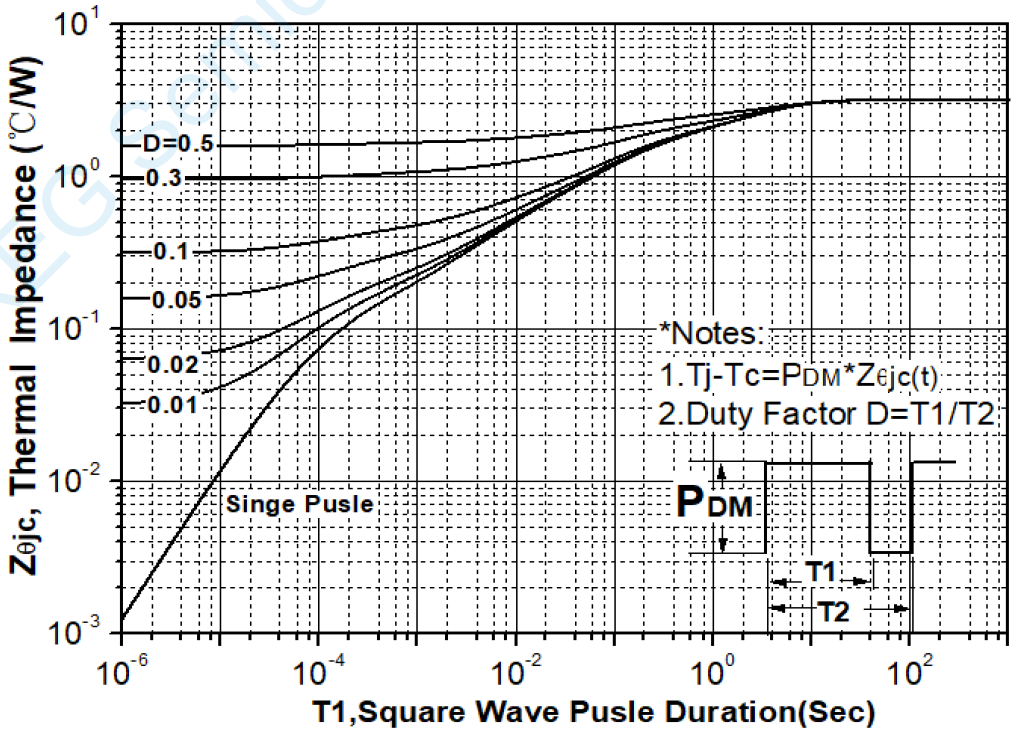


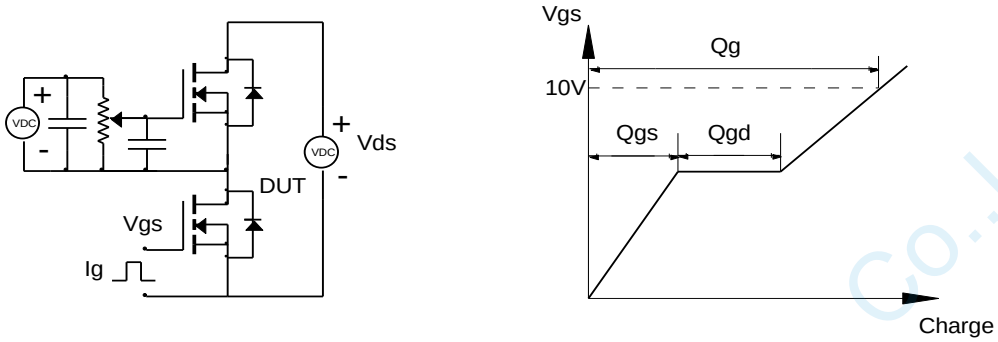
Fig. 17 Transient Thermal Response Curve



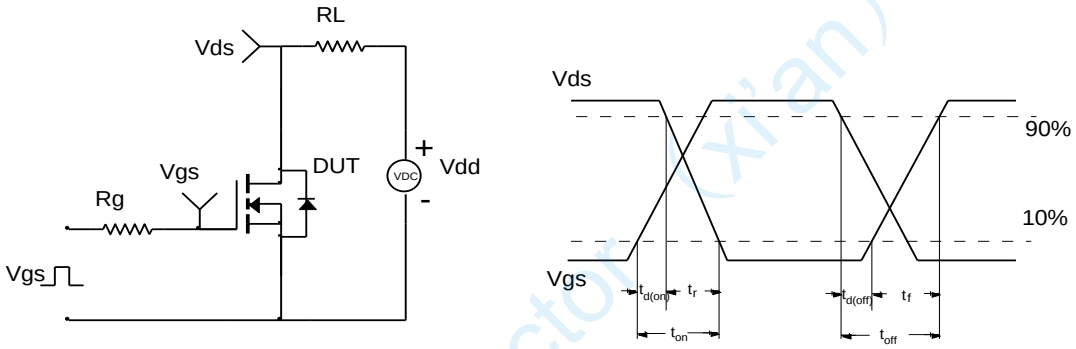
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TEST CIRCUIT

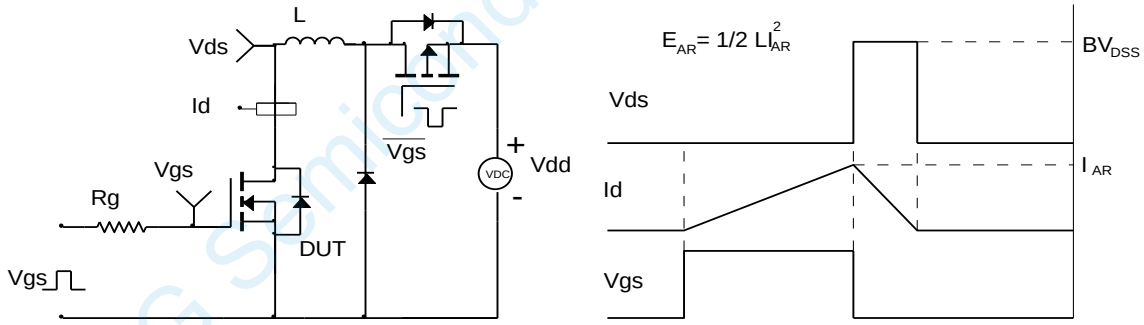
Gate Charge Test Circuit & Waveform



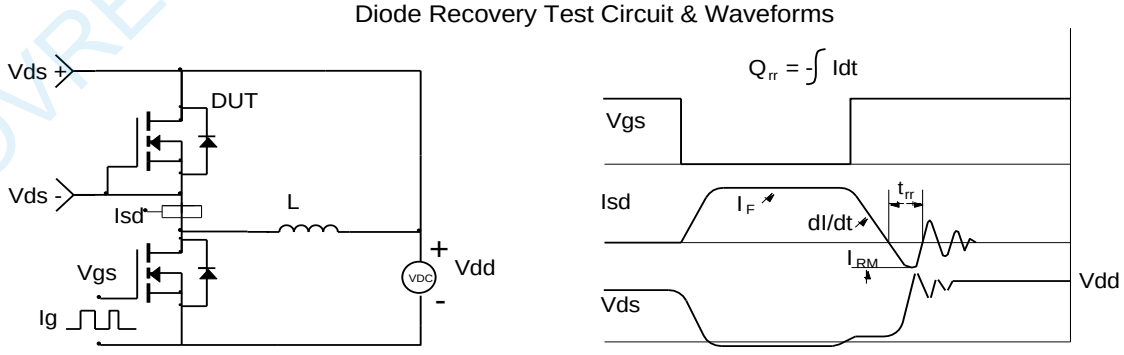
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

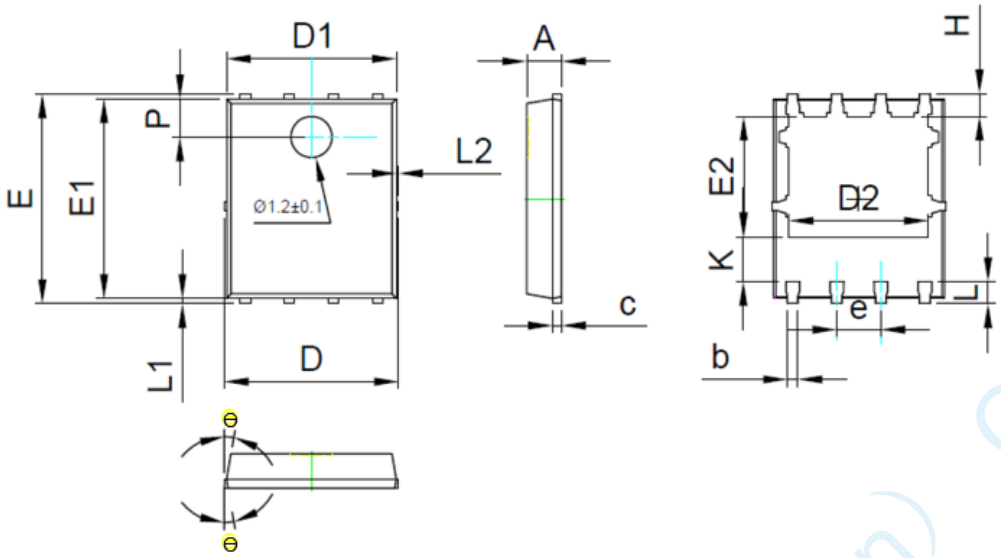


Diode Recovery Test Circuit & Waveforms



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Package Information



SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.35	0.40	0.45
c	0.21	0.25	0.34
D	-	-	5.1
D1	4.85	4.90	4.95
D2	3.96	4.01	4.06
e		1.27 BSC	
E	5.95	6.00	6.05
E1	5.70	5.75	5.80
E2	3.425	3.475	3.525
H	0.60	0.65	0.70
K	1.29	-	-
L	0.60	0.65	0.70
L1	0.05	0.15	0.25
L2	-	-	0.12
θ	8°	10°	12°
P	1.05	1.10	1.15

Ordering Information

Part number	Material	Type	Reel size	MOQ
OVM30N07D5	GREEN	T/R	13 inch	5k/reel

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