Single N-Channel, 30V, 240A, Power MOSFET

Features

- ✧ High density cell design for Low $R_{DS(on)}$
- ✧ Green device available
- ✧ Small package : DFN5x6
- ✧ Low $R_{DS(ON)}$

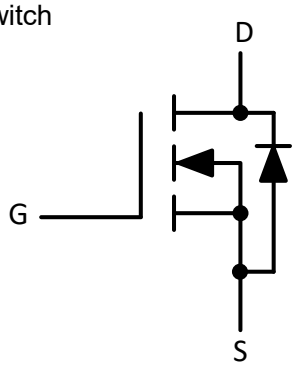
V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)
30	1.25 @ V_{GS}=4.5V
	0.96 @ V_{GS}=10V

Applications

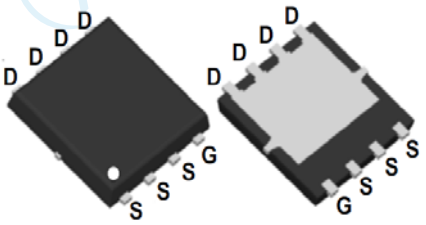
- ✧ High current load applications
- ✧ Load switch for portable devices
- ✧ Battery Switch

Mechanical Data

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



Circuit Diagram



DFN5x6

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@ 10V	T_C=25 ℃	I_D	240	A
	T_C=100℃		150	
Power Dissipation	T_C=25 ℃	P_D	104	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	13	℃/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	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA, V_{GS}=0V	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	μA
		T_J=55°C			5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±20V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.4	1.8	2.2	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=20A		0.96	1.15	mΩ
		T_J=125°		1.33		
		V_{GS}=4.5V, I_D=20A		1.25	1.50	
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=20A		140		S
V_{SD}	Diode Forward Voltage	I_S=1A, V_{GS}=0V		0.66		V
I_S	Maximum Body-Diode Continuous Current				110	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, f=1MHz		10354		pF
C_{oss}	Output Capacitance			1414		pF
C_{rss}	Reverse Transfer Capacitance			857		pF
R_g	Gate resistance	f=1MHz		2.0		Ω
SWITCHING PARAMETERS						
Q_g(10V)	Total Gate Charge	V_{GS}=10V, V_{DS}=15V, I_D=20A		180.2		nC
Q_g(4.5V)	Total Gate Charge			89.6		nC
Q_{gs}	Gate Source Charge			34.7		nC
Q_{gd}	Gate Drain Charge			35.1		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=15V, R_L=0.75Ω, R_{GEN}=3Ω		17.8		ns
t_r	Turn-On Rise Time			11.2		ns
$t_{D(off)}$	Turn-Off DelayTime			136.4		ns
t_f	Turn-Off Fall Time			25.8		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=20A, di/dt=200A/μs		37.5		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=20A, di/dt=200A/μs		37.6		nC

1) $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
2) The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3) Single pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
4) $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.
5) The maximum current rating is package limited.

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

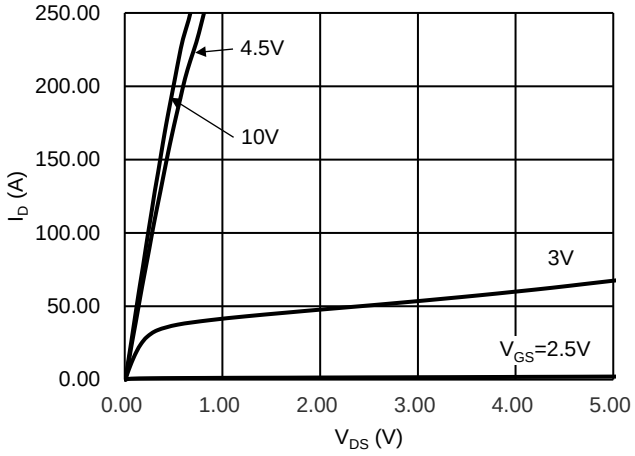


Fig 1. Typical Output Characteristics

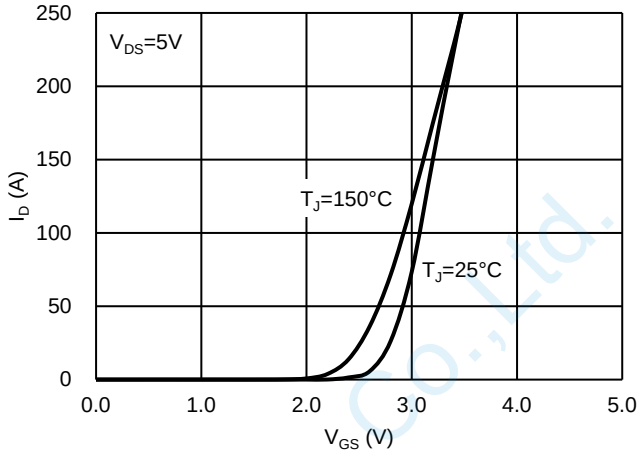


Fig 2. Typical Transfer Characteristics

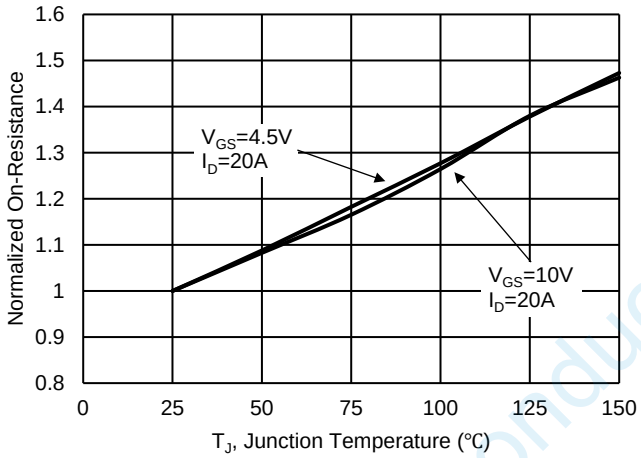


Fig 3. Normalized On-Resistance vs. Temperature

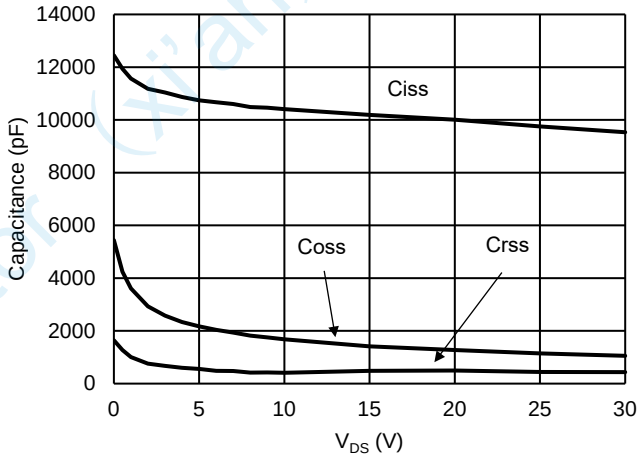


Fig 4. Typical Capacitance vs. V_{DS}

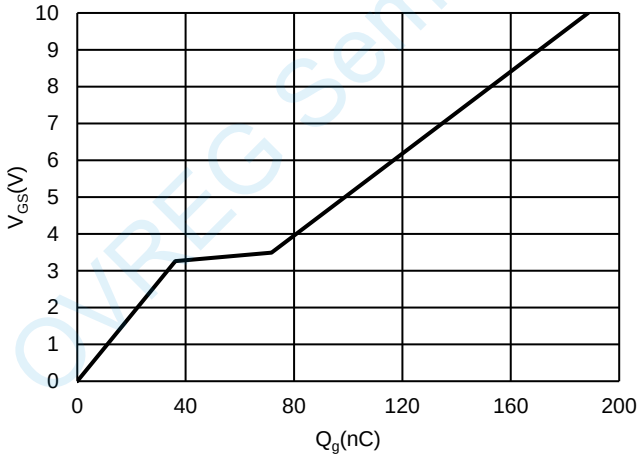


Fig 5. Typical Gate Charge vs. V_{GS}

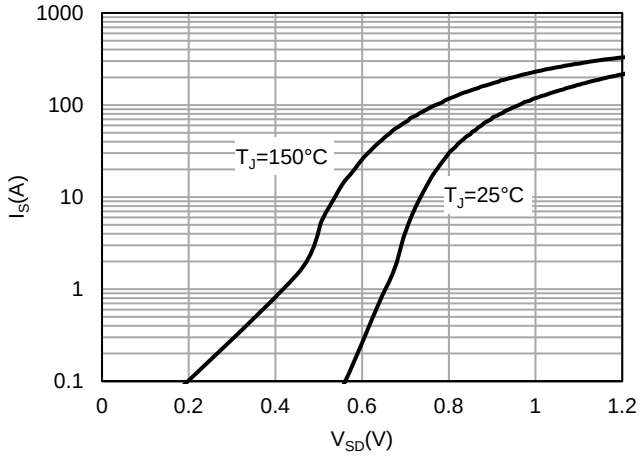


Fig 6. Typical Source-Drain Diode Forward Voltage

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

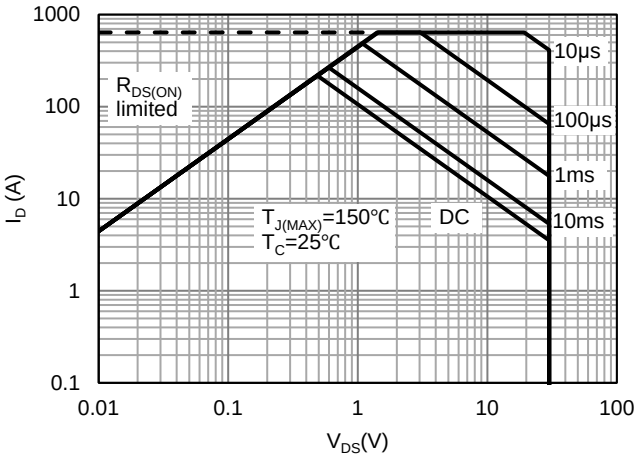


Fig 7. Maximum Safe Operating Area

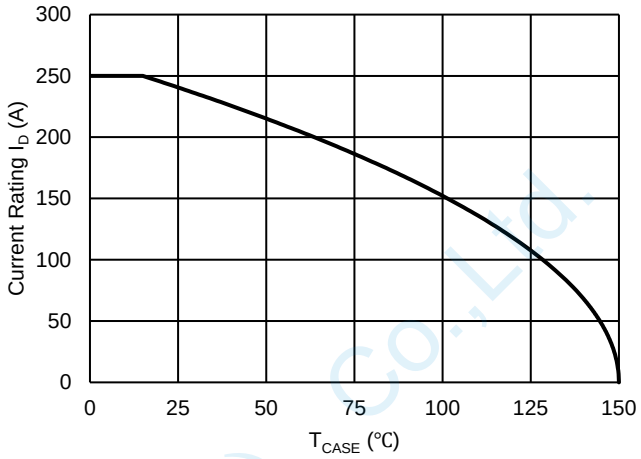


Fig 8. Maximum Drain Current vs. Case Temperature

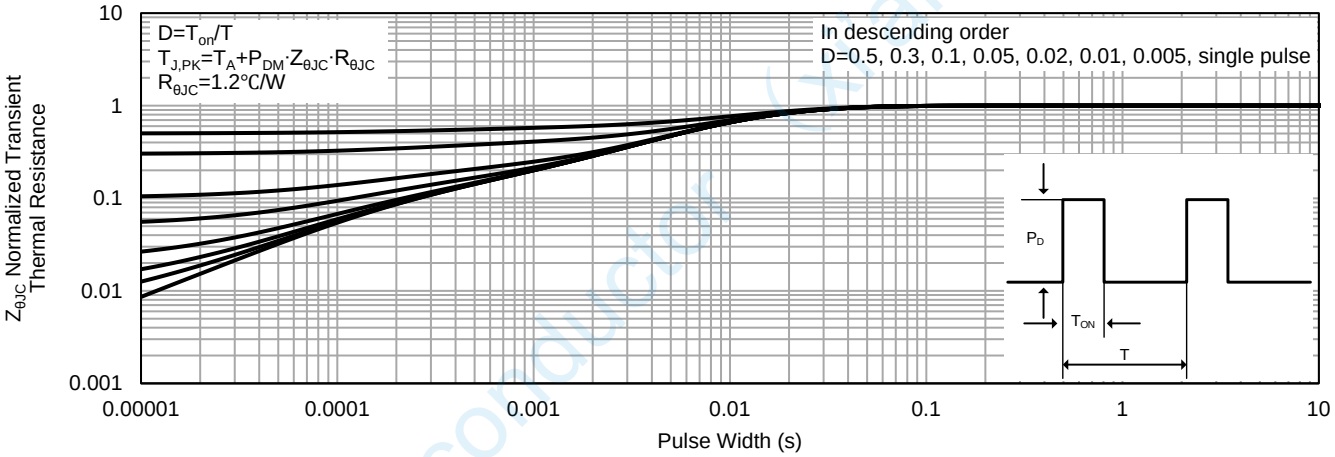


Fig 9. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

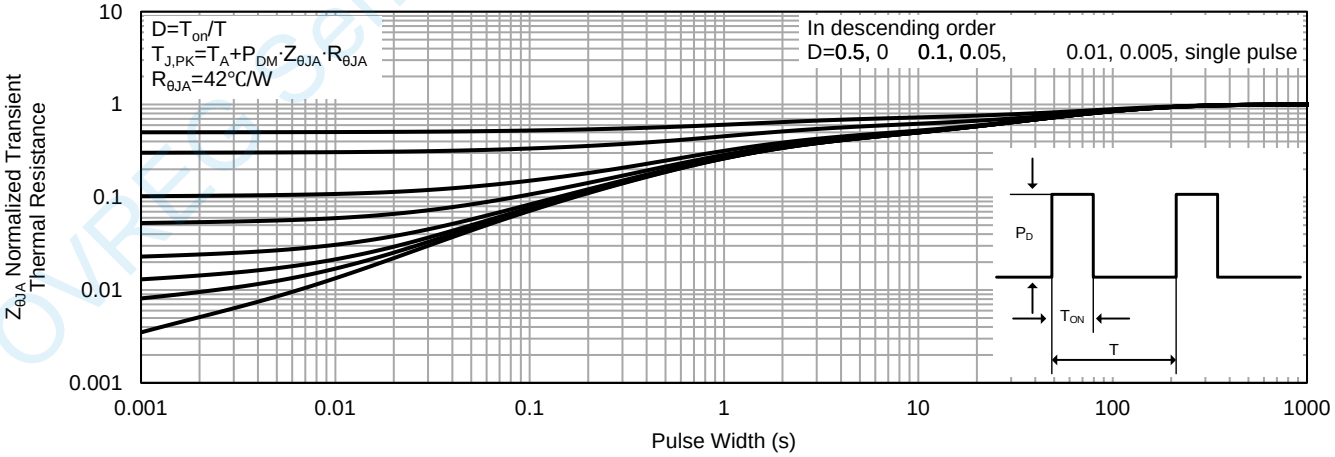


Fig 10. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient

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

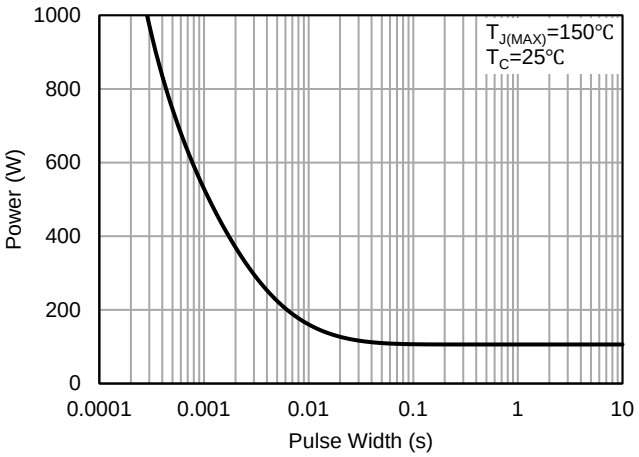


Fig 11. Single Pulse Power Rating Junction-to-Case

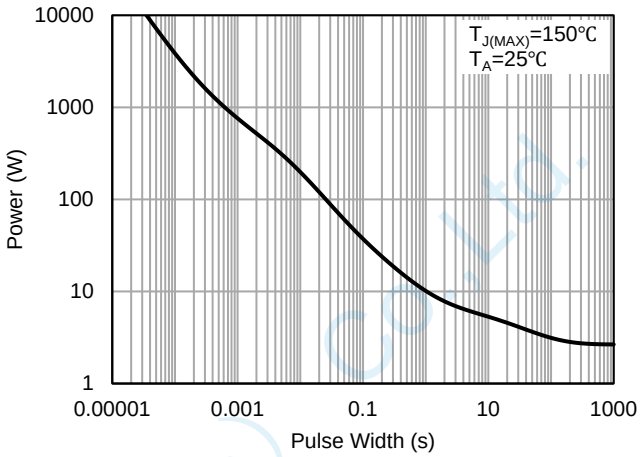


Fig 12. Single Pulse Power Rating Junction-to-Ambient

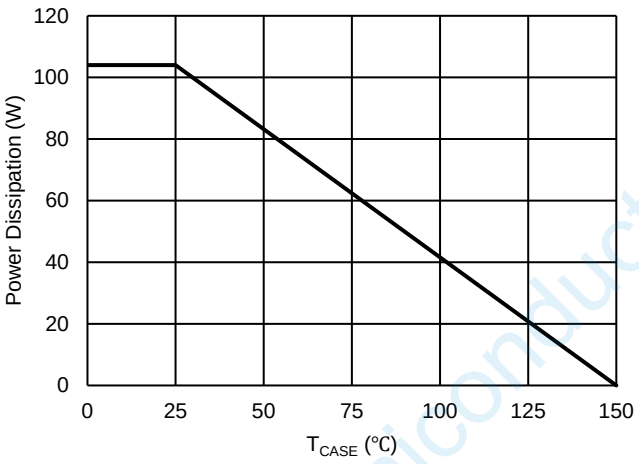


Fig 13. Maximum Power Rating vs. Temperature

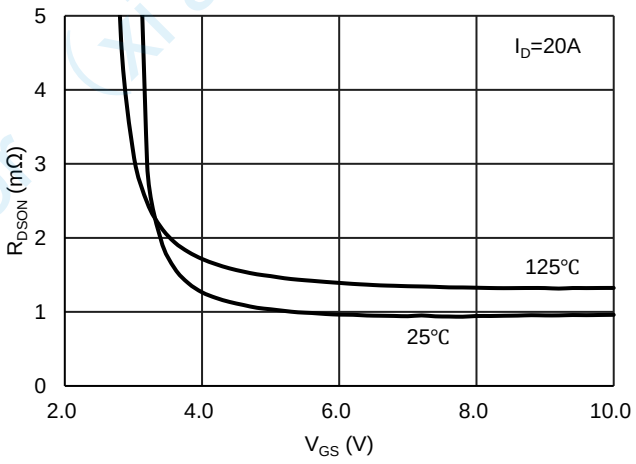


Fig 14. On-Resistance vs. V_{GS}

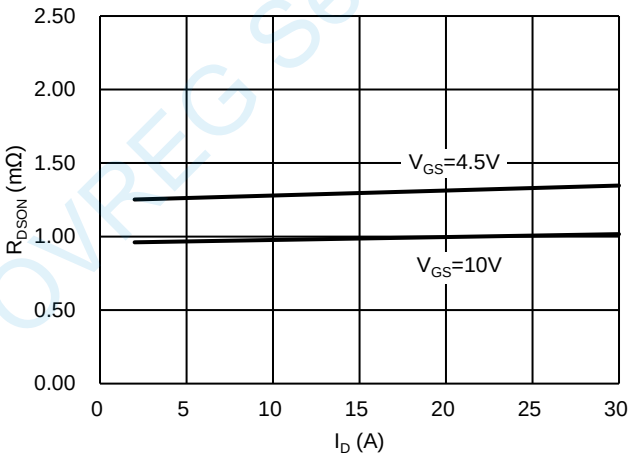


Fig 15. On-Resistance vs. Drain Current

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TEST CIRCUIT

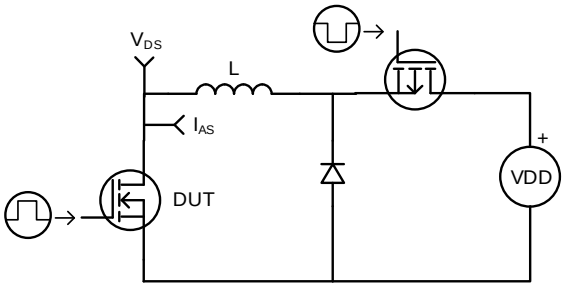


Fig16. Unclamped Inductive Test Circuit

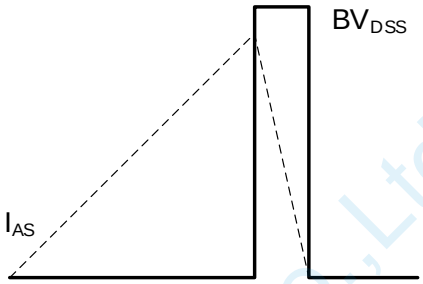


Fig17. Unclamped Inductive Waveform

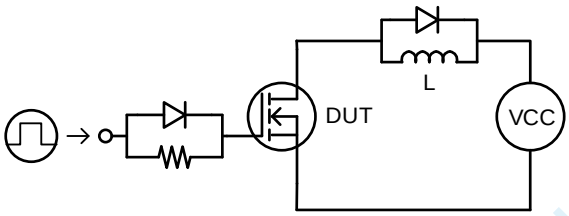


Fig18. Q_g Test Circuit

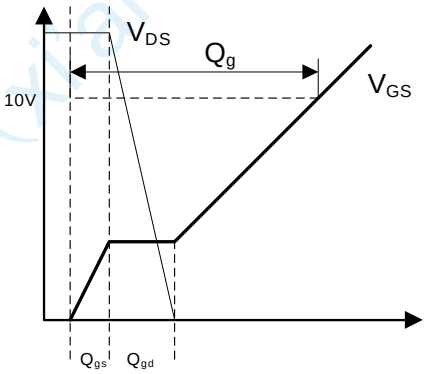


Fig19. Q_g Waveform

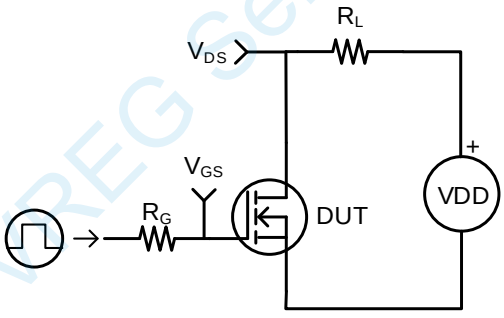


Fig20. Resistive Switching Test Circuit

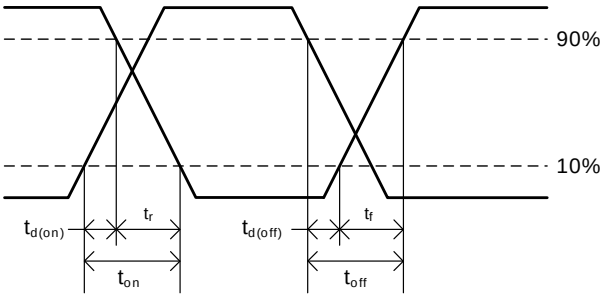


Fig21. Switching Time Waveform

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TEST CIRCUIT

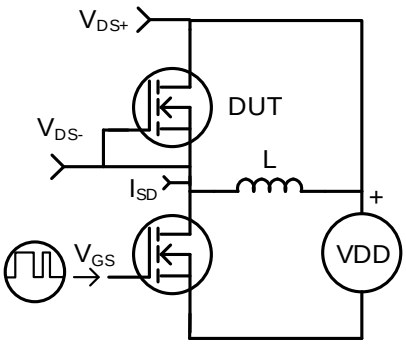


Fig22. Diode Recovery Test Circuit

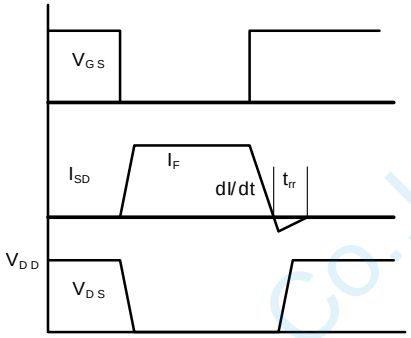
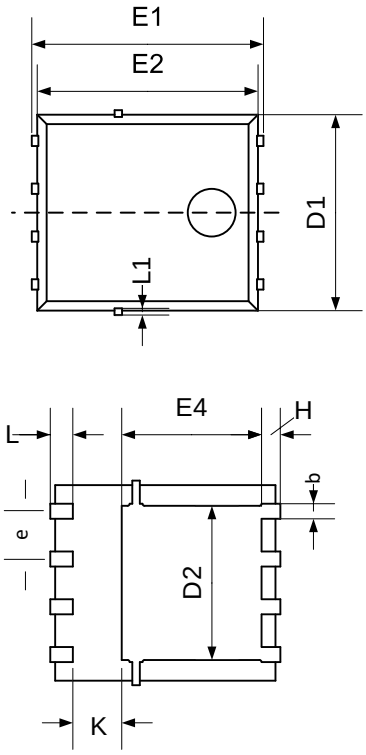
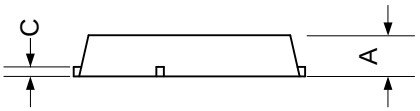


Fig23. Diode Recovery Test Waveform

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Package Information





DIM / SYMBOL	MILLIMITERS	
	MIN [mm]	MAX [mm]
A	0.900	1.000
b	0.350	0.450
C	0.254 REF	
D1	4.824	4.976
D2	3.910	4.110
e	1.270 TYP	
E1	5.974	6.126
E2	5.674	5.826
E4	3.375	3.575
H	0.574	0.726
K	1.190	1.390
L	0.559	0.711
L1	0	0.120

Ordering Information

Part number	Material	Type	Reel size	MOQ
OVM30N01D5	GREEN	T/R	13 inch	5k/reel

OVREG Semiconductor (xi'an) Co.,Ltd.