WGD68P10

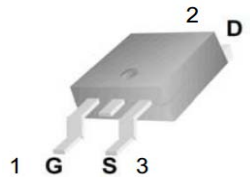
100VP-Channel MOSFET

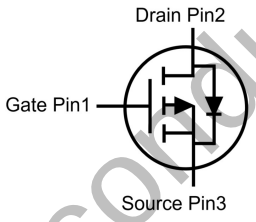
Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg=117nC (Typ.).
- ☐ BVDSS=-100V,I_D=-68A
- ☐ R_{DS}(on) : 30mΩ (Max) @V_G=-10V
- ☐ 100% Avalanche Tested

TO-252

RoHS COMPLIANT





1.Gate (G)
2.Drain (D)
3.Sourse (S)

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Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage		-100	V
V_{GS}	Gate-source voltage		±20	V
I_S	Diode continuous forward current (Silicon limited)	T_C = 25°C	-68	A
I_D	Continuous drain current @V_{GS}=-10V (Silicon limited)	T_C = 25°C	-68	A
I_D	Continuous drain current @V_{GS}=-10V (Silicon limited)	T_C = 100°C	-48	A
I_{DM}	Pulse drain current tested ①	T_C = 25°C	-225	A
I_{DSM}	Continuous drain current @VGS=-10V	T_A = 25°C	-6.2	A
		T_A = 70°C	-5	A
EAS	Maximum avalanche energy, single pulsed ②		361	mJ
P_D	Maximum power dissipation ③	T_C = 25°C	300	W
		T_C = 100°C	150	W
P_{DSM}	Maximum power dissipation ④	T_A = 25°C	2.5	W
		T_A = 70°C	1.6	W
T_J,T_{STG}	Operating junction and storage temperature range		-55 to 175	°C

Thermal Characteristic

Symbol	Parameter	Typical	Max	Unit
$R_{\theta JC}$	Thermal resistance, junction-to-case ⑤	0.4	0.5	°C/W
$R_{\theta JA}$	Thermal resistance, junction-to-ambient ⑥	42	50	°C/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-source breakdown voltage	V_{GS}=0V, I_D=-250μA	-100	--	--	V
I_{DSS}	Zero gate voltage drain current(Tj=25℃)	V_{DS}=-100V,V_{GS}=0V	--	--	-1	μA
	Zero gate voltage drain current(Tj=125℃) ⑦	V_{DS}=-100V,V_{GS}=0V	--	--	-100	μA
I_{GSS}	Gate-body leakage current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS}=V_{GS},I_D=-250μA	-1.3	-1.8	-2.4	V
$R_{DS(on)}$	Drain-source on-state resistance ⑧	V_{GS}=-10V, I_D=-25A	--	26	30	mΩ
		(T_j=100℃)⑦	--	40	--	mΩ
$R_{DS(on)}$	Drain-source on-state resistance ⑧	V_{GS}=-4.5V, I_D=-10A	--	29	35	mΩ
G_{FS}	Forward transconductance	V_{DS}=-5V, I_D=-25A	--	52	--	S
Dynamic Electrical Characteristics @ T_j= 25°C (unless otherwise stated)						
Ciss	Input capacitance ⑦	V_{DS}=-50V,V_{GS}=0V, f=100KHz	--	7645	--	pF
Coss	Output capacitance ⑦		--	250	--	pF
Crss	Reverse transfer capacitance ⑦		--	155	--	pF
Rg	Gate resistance	f=1MHz	--	13	--	Ω
Qg(-10V)	Total gate charge ⑦	V_{DS}=-50V,I_D=-25A, V_{GS}=-10V	--	117	--	nC
Qg(-4.5V)	Total gate charge ⑦		--	54	--	nC
Qgs	Gate-source charge ⑦		--	24	--	nC
Qgd	Gate-drain charge ⑦		--	16	--	nC
Switching Characteristics ⑦						
Td(on)	Turn-on delay time	V_{DD}=-50V, I_D=-25A, R_G=2.7Ω, V_{GS}=-10V	--	9.2	--	ns
Tr	Turn-on rise time		--	37	--	ns
Td(off)	Turn-off delay time		--	83	--	ns
Tf	Turn-off fall time		--	284	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=-25A,V_{GS}=0V	--	-0.83	-1	V
Trr	Reverse recovery time ⑦	V_{DD}=-50V I_{sd}=-25A, V_{GS}=0V di/dt=-100A/μs	--	36	--	ns
Qrr	Reverse recovery charge ⑦		--	59	--	nC

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Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. E_{AS} condition: Tj=25℃,V_{DD}=-30V,V_G=-10V,L=0.5mH,Rg=25Ω

Typical Characteristics

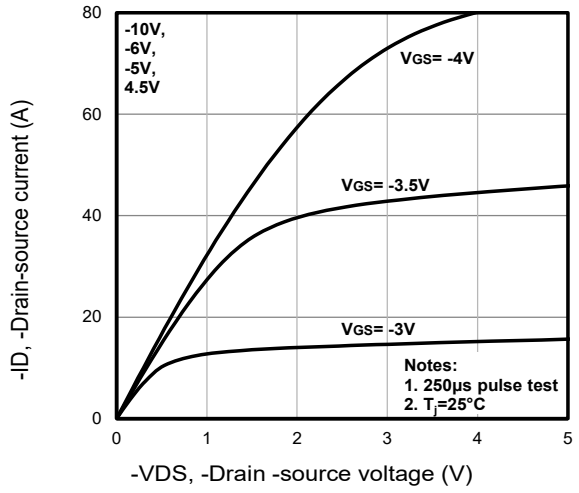


Fig1. Typical output characteristics

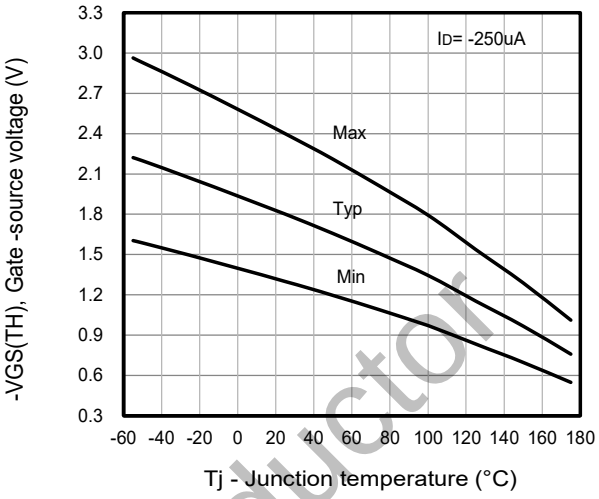


Fig2. Typical $V_{GS(TH)}$ gate -source voltage Vs Tj

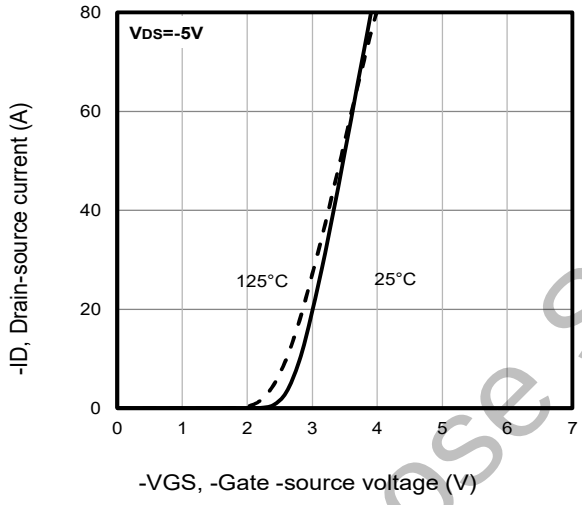


Fig3. Typical transfer characteristics

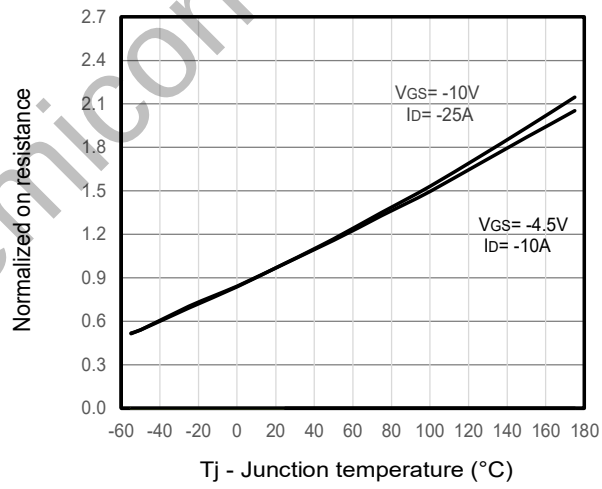


Fig4. Typical normalized on-resistance Vs. Tj

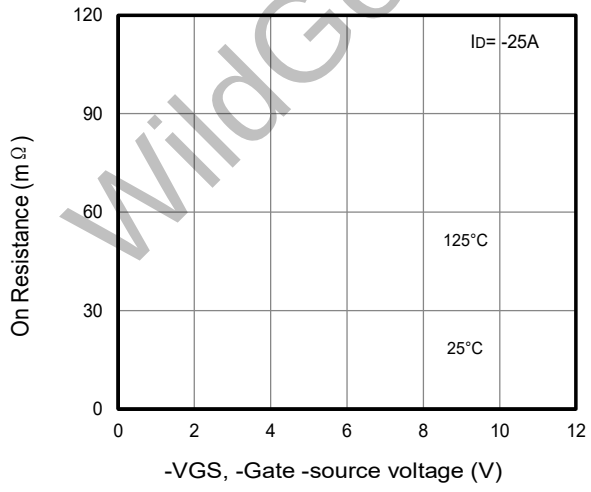


Fig5. Typical on resistance Vs gate -source voltage

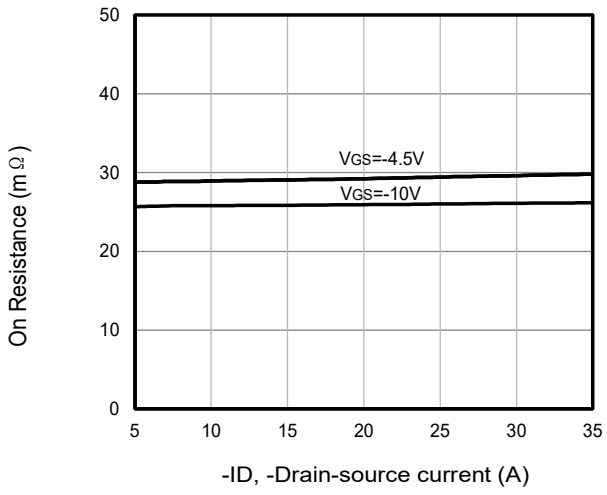


Fig6. Typical on resistance Vs drain current

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Typical Characteristics

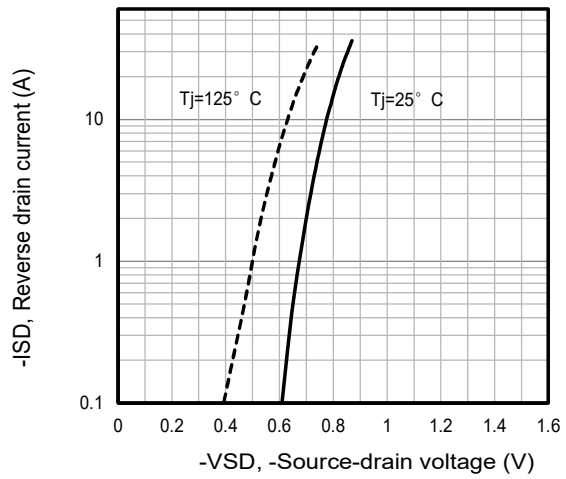


Fig7. Typical source-drain diode forward voltage

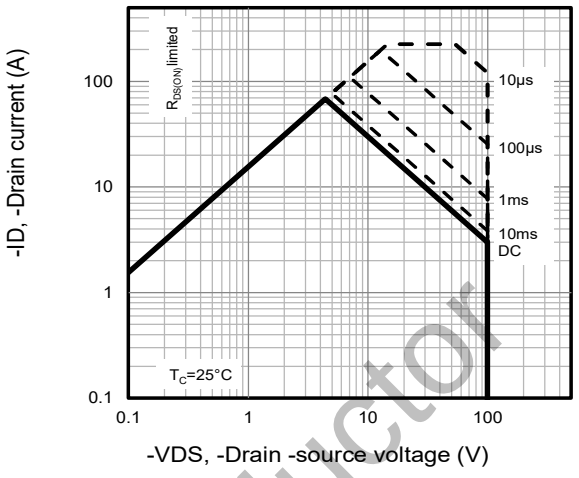


Fig8. Maximum safe operating area

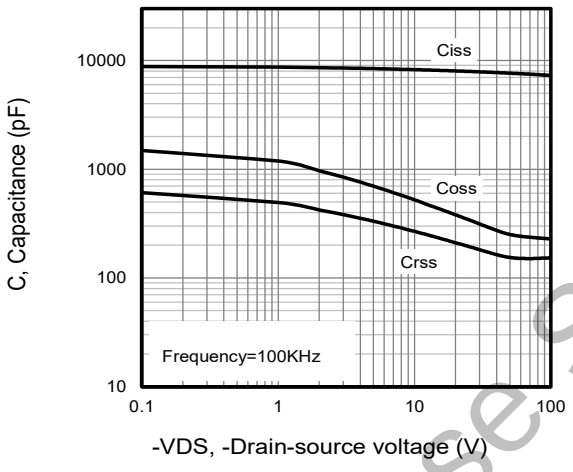


Fig9. Typical capacitance Vs drain-source voltage

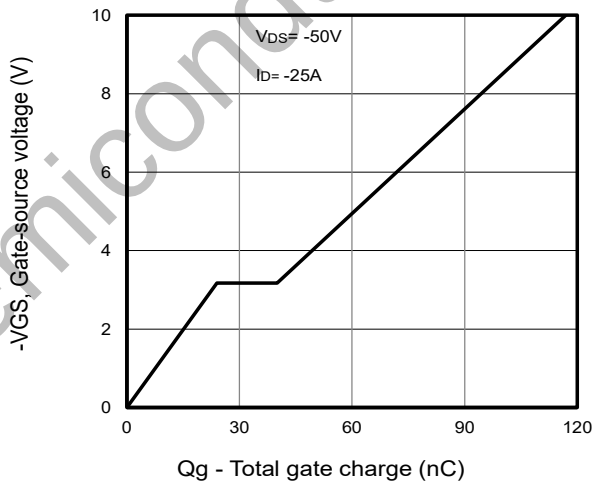


Fig10. Typical gate charge Vs gate-source voltage

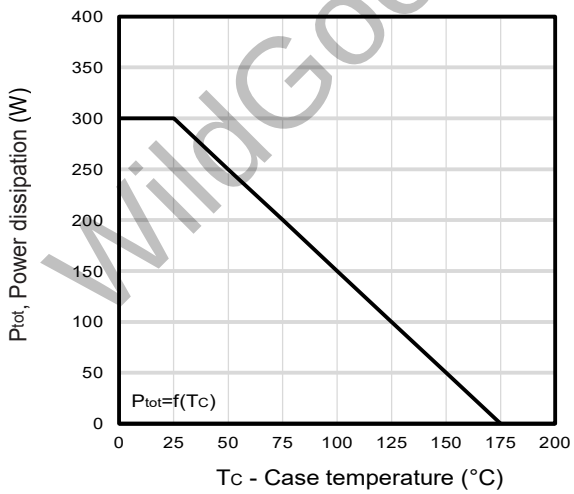


Fig11. Power dissipation Vs. case temperature

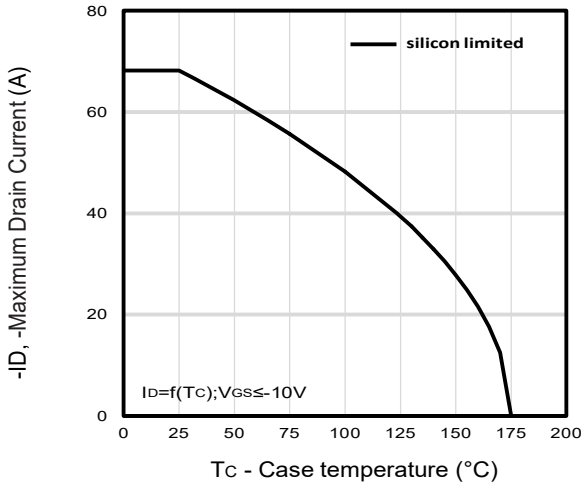


Fig12. Maximum drain current Vs. case temperature

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Typical Characteristics

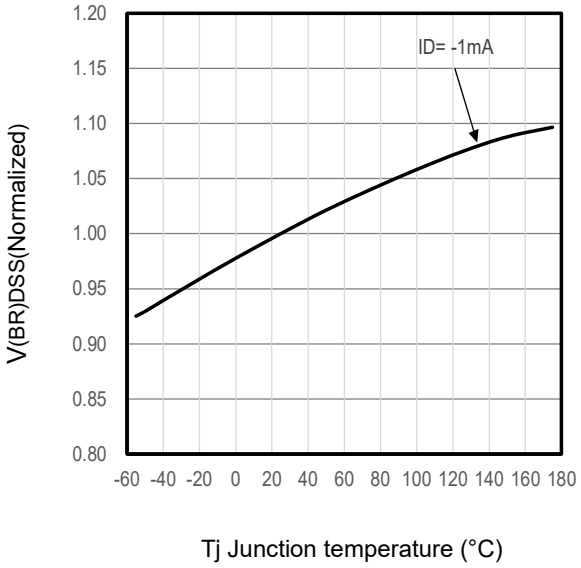


Fig13. Typical $V_{(BR)DSS}$ Vs Tj

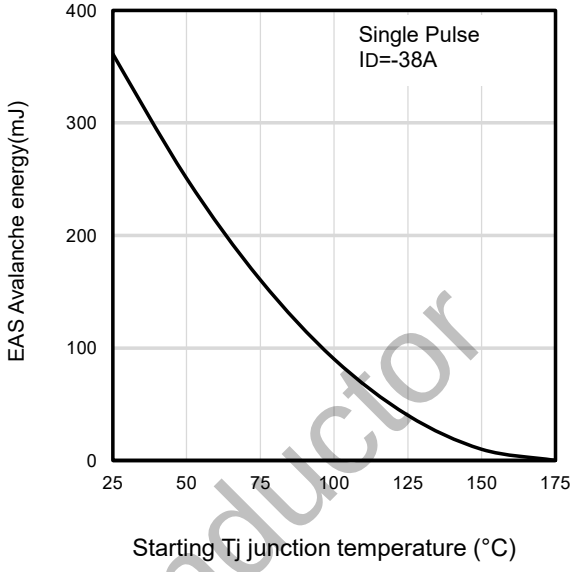


Fig14. Maximum avalanche energy vs temperature (°C)

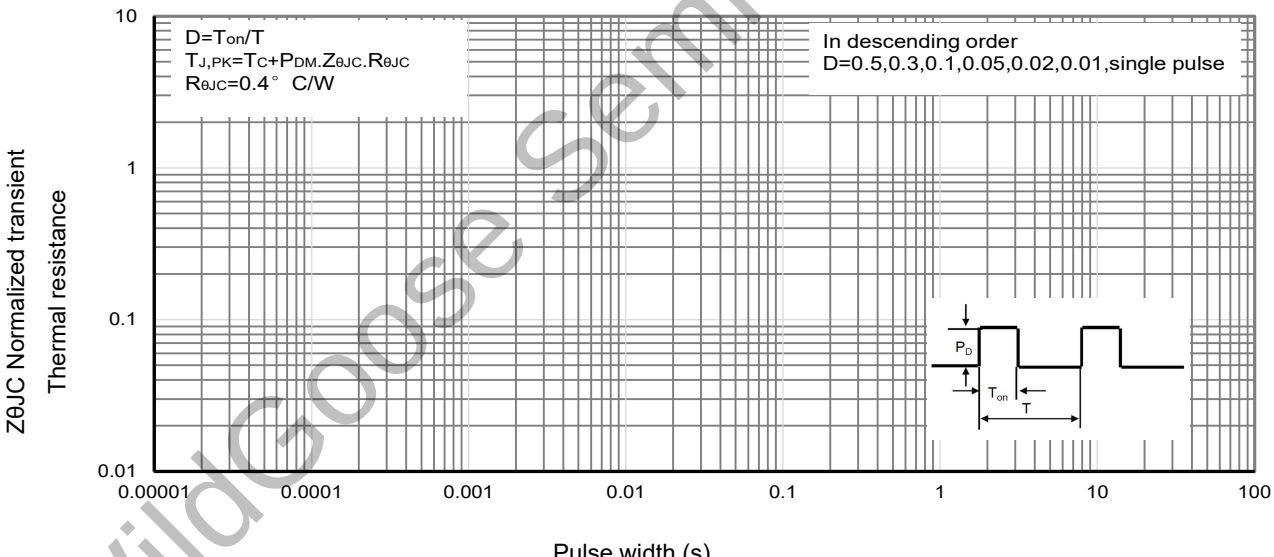
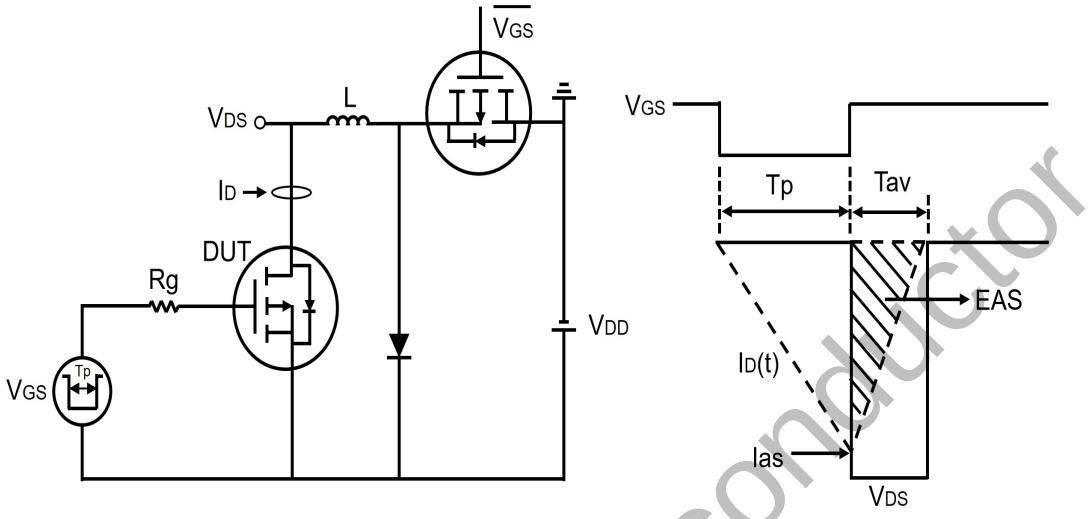


Fig15 . Normalized maximum transient thermal impedance

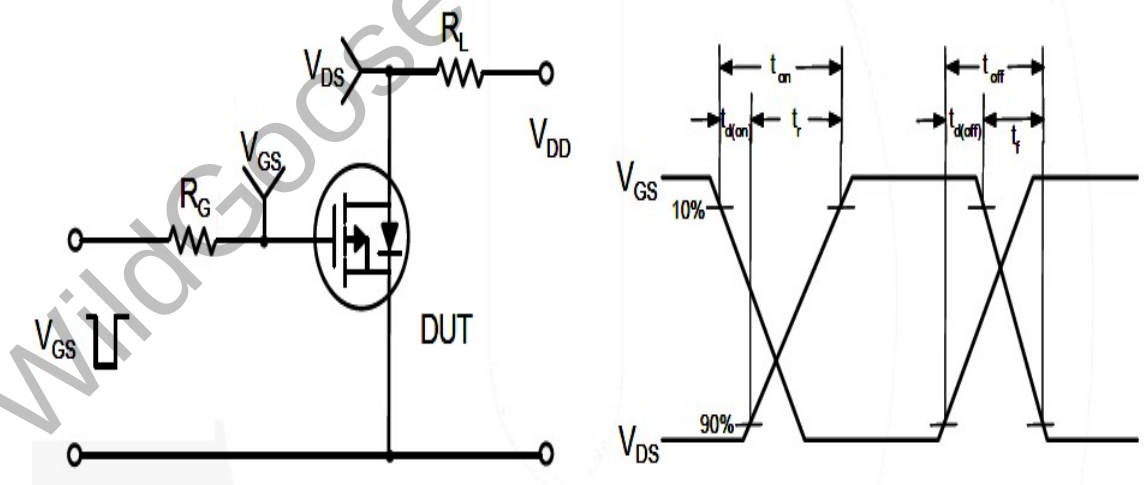
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Test Circuit

Unclamped Inductive Test Circuit and waveforms



Switching Time Test Circuit and waveforms

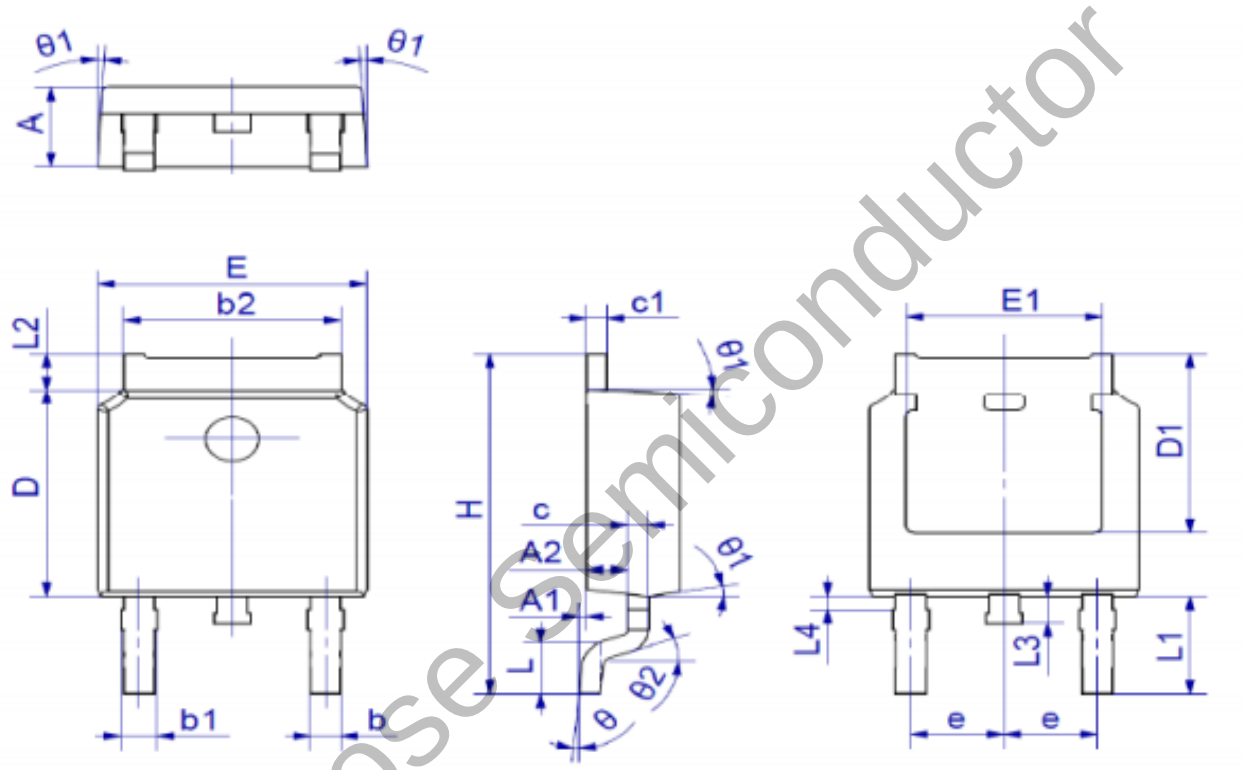


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Package Dimension

TO-252

Unit: mm



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