

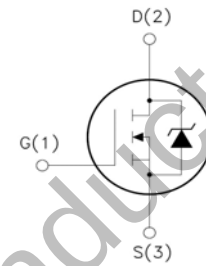
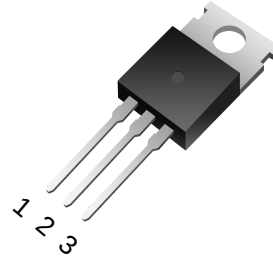


WGP018V25G

Features:

- ☐ Advanced Trench Technology
- ☐ Excellent Switching Characteristics
- ☐ Extended Safe Operating Area
- ☐ Ultra Low Gate Charge: $Q_g=62.7\text{nC}$ (Typ.)
- ☐ $V_{DS}=250\text{V}$, $I_D=90\text{A}$
- ☐ $R_{ds(on)}:15.5\text{m}\Omega$ (Typ.) @ $V_G=10\text{V}$
- ☐ 100% Avalanche Tested

TO-220



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

Absolute Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	250	V
Continuous drain current	I_D	90	A
$T_C = 25^\circ\text{C}$ (Silicon limit)		180	
$T_C = 25^\circ\text{C}$ (Package limit)		57	
$T_C = 100^\circ\text{C}$ (Silicon limit)			
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D \text{ pulse}}$	360	A
Avalanche energy, single pulse ($I_D = 53\text{A}$, $R_g = 25\Omega$) ^[1]	E_{AS}	690	mJ
Gate-Source voltage	V_{GS}	± 20	V
Power dissipation ($T_C = 25^\circ\text{C}$)	P_{tot}	291	W
Operating junction and storage temperature	T_j, T_{stg}	$-55...+150$	$^\circ\text{C}$

※. Notes:

1.EAS is tested at starting $T_j = 25^\circ\text{C}$, $L = 0.5\text{mH}$, $I_{AS} = 53\text{A}$, $V_{GS} = 10\text{V}$.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.43	$^\circ\text{C/W}$
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	62	

Electrical Characteristic (at T_j = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Drain-source breakdown voltage	BV _{DSS}	250	-	-	V	V _{GS} =0V, I _D =250uA
		250	-	-	V	V _{GS} =0V, I _D =1mA
Gate threshold voltage	V _{GS(th)}	2.0	3.0	4.0	V	V _{DS} =V _{GS} , I _D =250uA
Zero gate voltage drain current	I _{DSS}	-	-	1 100	μA	V _{DS} =250V, V _{GS} =0V T _j =25°C T _j =125°C
Gate-source leakage current	I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
Drain-source on-state resistance	R _{DS(on)}	-	15.5	18.5	mΩ	V _{GS} =10V, I _D =40A
Transconductance	g _{fs}	58.5	87.7	131.6	S	V _{DS} =5V, I _D =40A

Dynamic Characteristic

Input Capacitance	C _{iss}	3005	4508	6762	pF	V _{GS} =0V, V _{DS} =125V, f=1MHz
Output Capacitance	C _{oss}	201	302	453		
Reverse Transfer Capacitance	C _{rss}	3.8	7.6	15.2		
Gate Total Charge	Q _G	41.8	62.7	94.1	nC	V _{GS} =10V, V _{DS} =125V, I _D =40A
Gate-Source charge	Q _{gs}	18.5	27.8	41.7		
Gate-Drain charge	Q _{gd}	3.9	7.7	15.4		
Turn-on delay time	t _{d(on)}	-	14.4	-	ns	V _{GS} =10V, V _{DD} =125V, R _{G_ext} =2.7Ω
Rise time	t _r	-	48.4	-		
Turn-off delay time	t _{d(off)}	-	52.1	-		
Fall time	t _f	-	30.8	-		
Gate resistance	R _G	-	3.2	-	Ω	V _{GS} =0V, V _{DS} =0V, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V _{SD}	-	0.85	1.4	V	V _{GS} =0V, I _{SD} =40A
Body Diode Reverse Recovery Time	t _{rr}	-	167.0	-	ns	I _F =40A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q _{rr}	-	1055.0	-	nC	

Typical Electrical & Thermal Characteristics

Fig 1: Output Characteristics

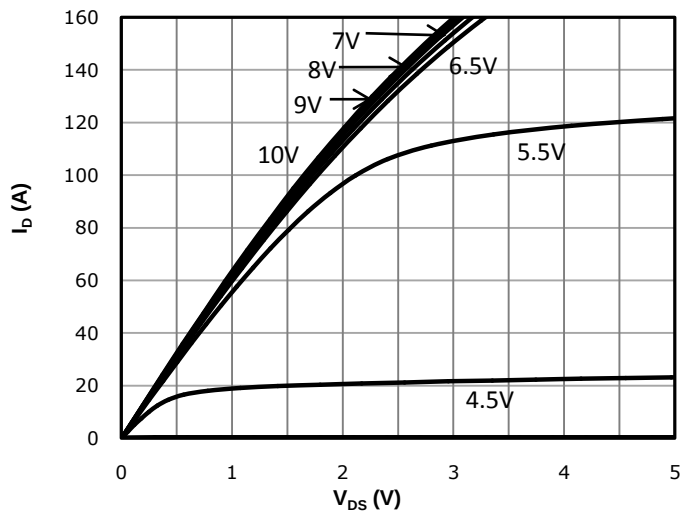
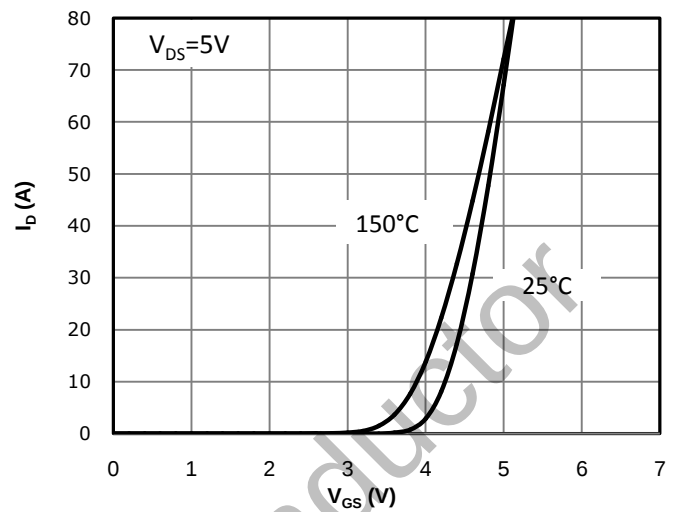
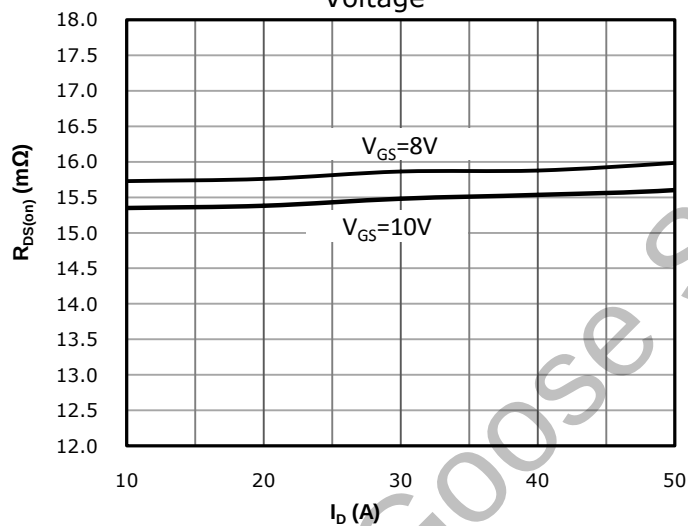
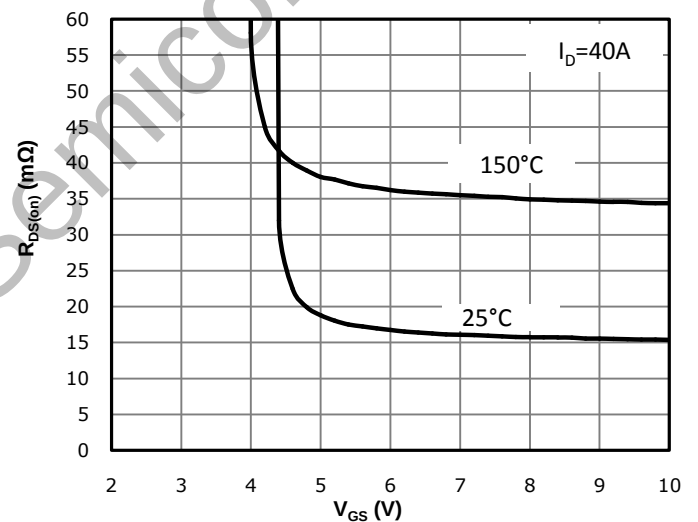
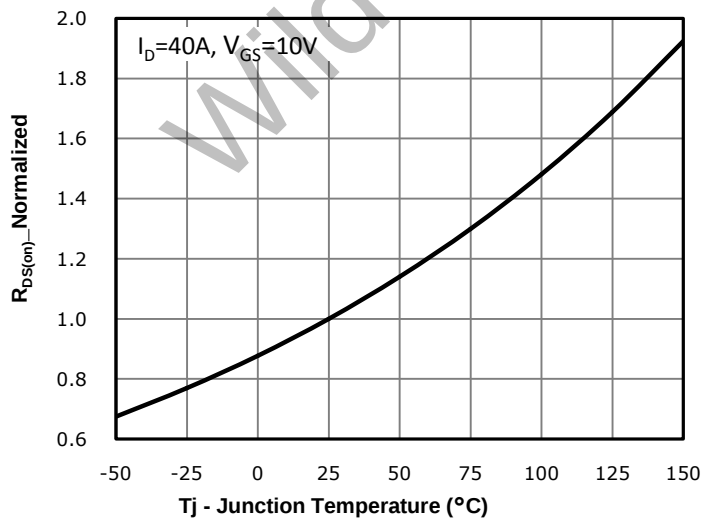
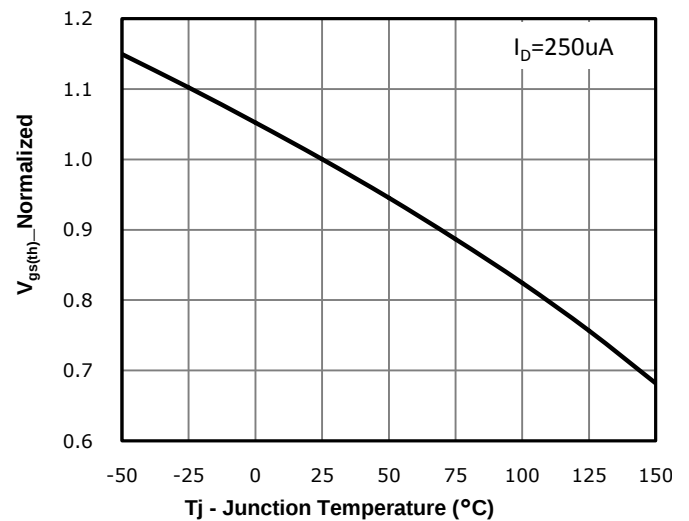


Fig 2: Transfer Characteristics

Fig 3: $R_{DS(on)}$ vs Drain Current and Gate VoltageFig 4: $R_{DS(on)}$ vs Gate VoltageFig 5: $R_{DS(on)}$ vs. TemperatureFig 6: $V_{GS(th)}$ vs. Temperature

Typical Electrical & Thermal Characteristics

Fig 7: BVdss vs. Temperature

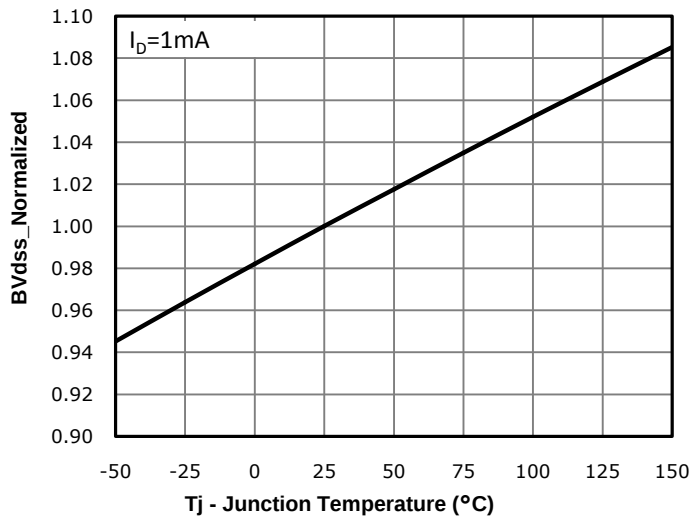


Fig 8: Capacitance Characteristics

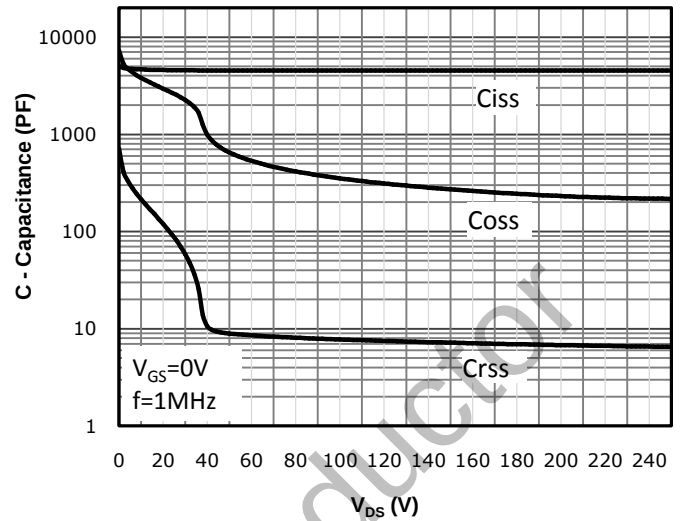


Fig 9: Gate Charge Characteristics

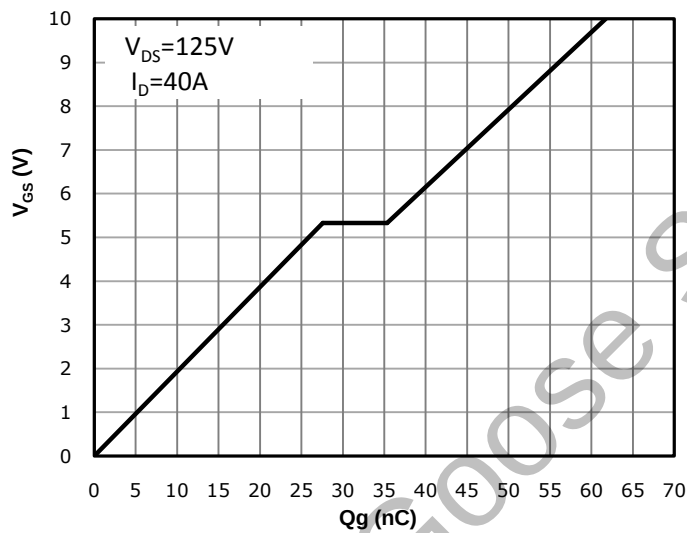


Fig 10: Body-diode Forward Characteristics

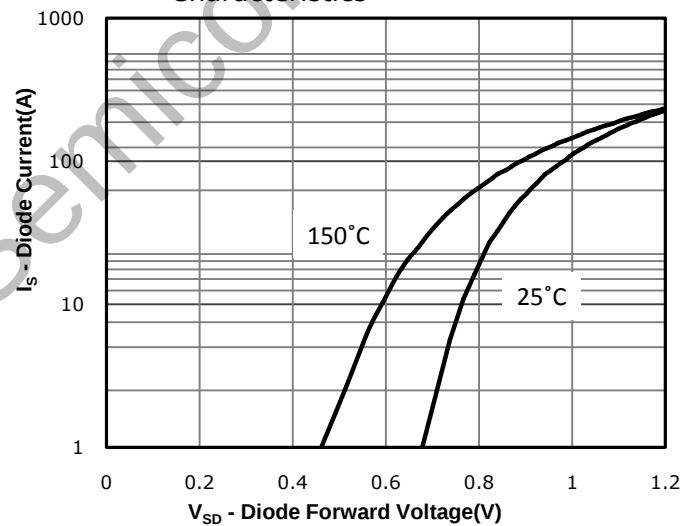


Fig 11: Power Dissipation

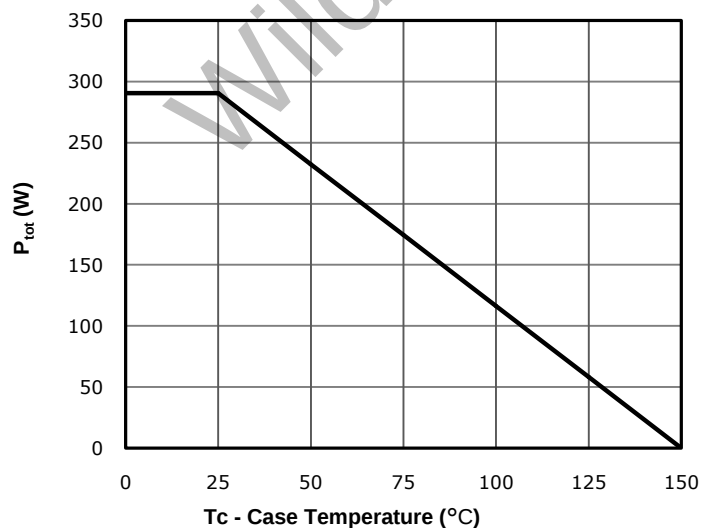
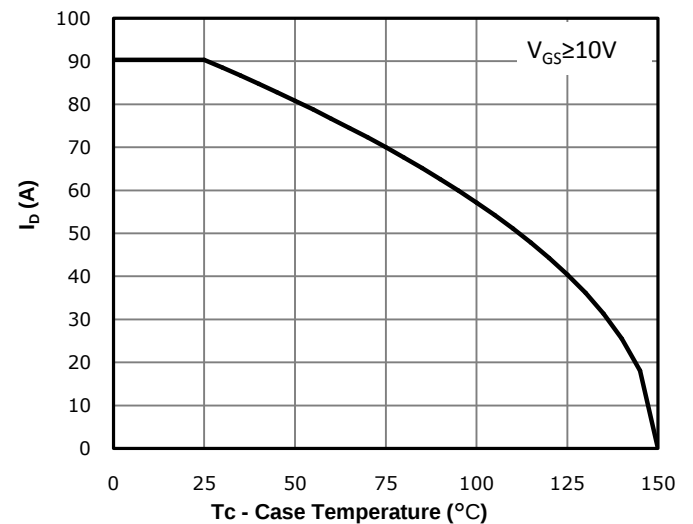


Fig 12: Drain Current Derating



Typical Electrical & Thermal Characteristics

Fig 13: Safe Operating Area

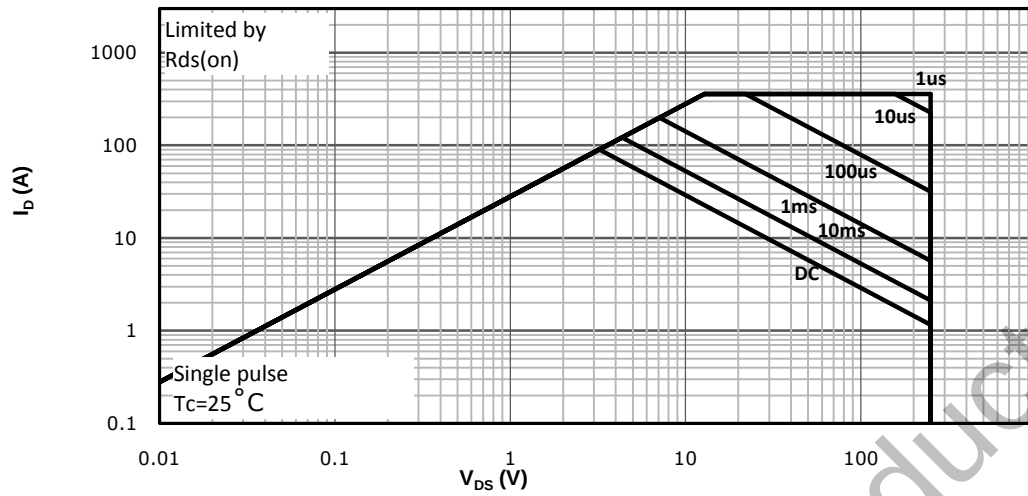
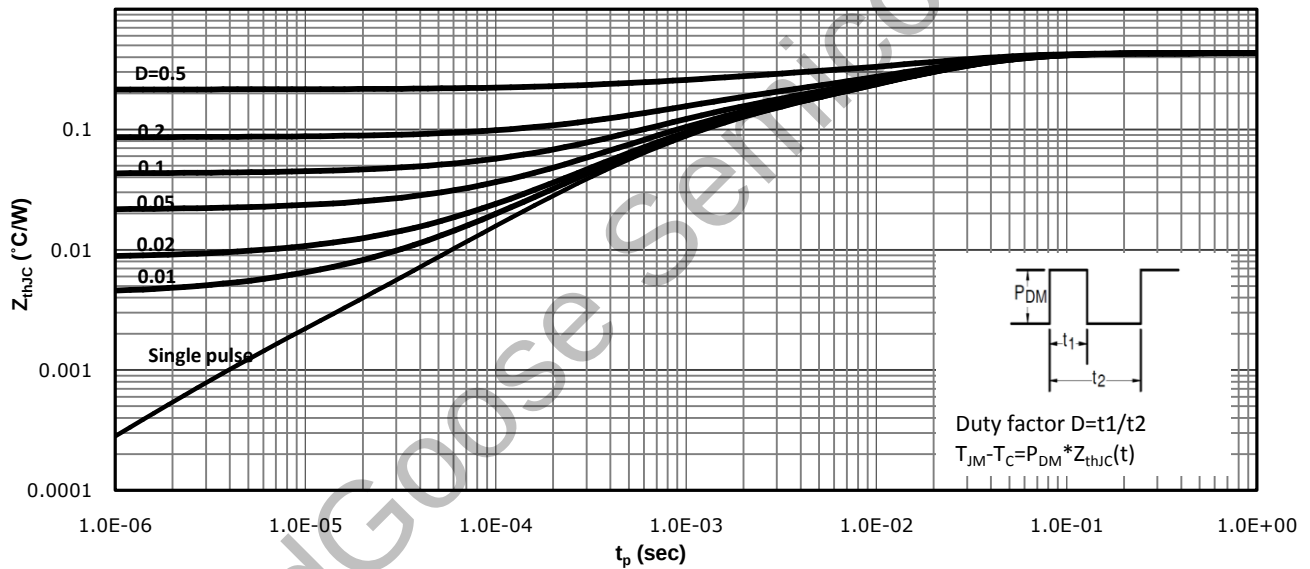
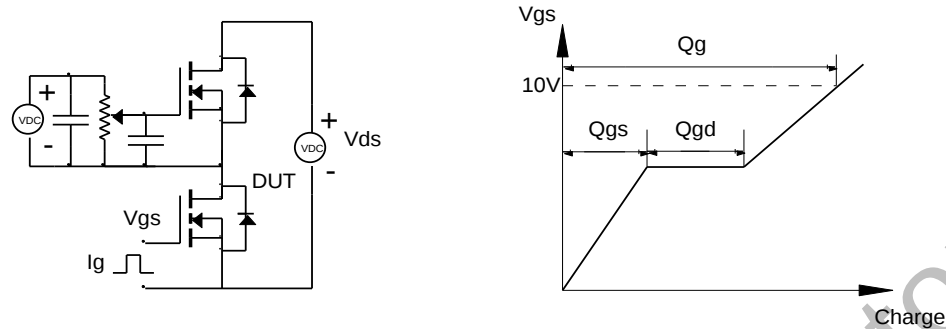


Fig 14: Max. Transient Thermal Impedance

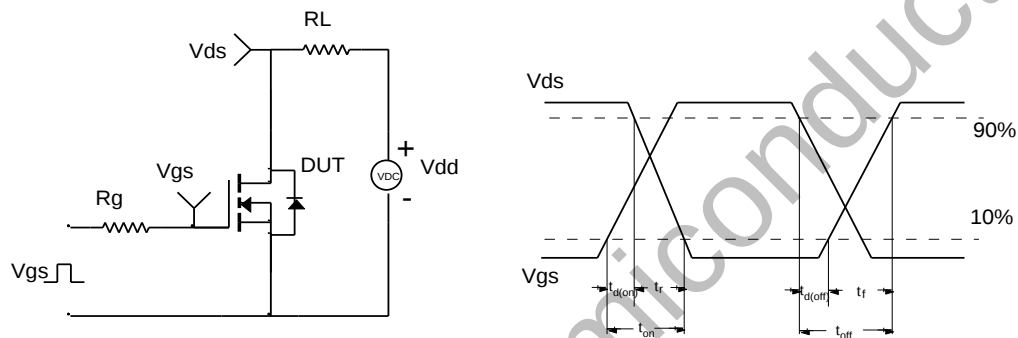


Test Circuit

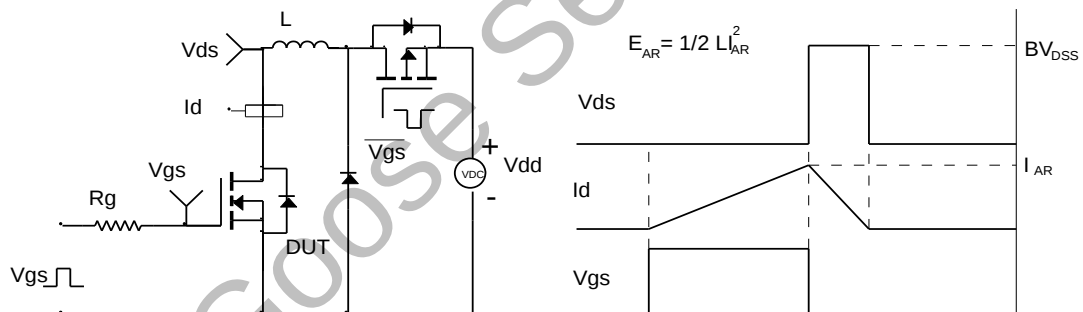
Gate Charge Test Circuit & Waveform



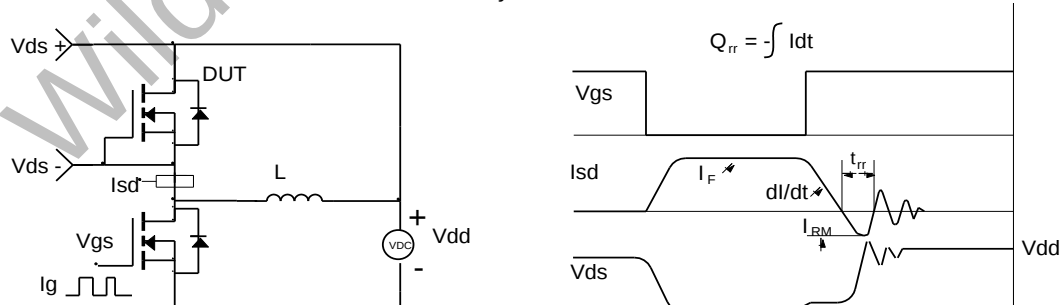
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Dimension

TO-220

Unit: mm

