

MT82P01N3

P-Channel Enhancement Mode Field Effect Transistor

Product Summary

- $V_{DS} = -20V$
- $I_D = -3.5A$
- $R_{DS(ON)} = 75m\Omega$
@ $V_{GS} = -4.5V/-3.5A$
- $R_{DS(ON)} = 120m\Omega$
@ $V_{GS} = -2.5V/-3.5A$

Features

- Advanced Trench Process Technology.
- High Density Cell Design for Ultra Low
- On-Resistance.
- Lead free product is acquired.
- RoHS Compliant.

Applications :

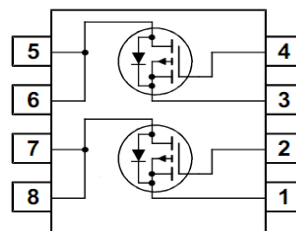
- Load Switch.
- PWM Applications.



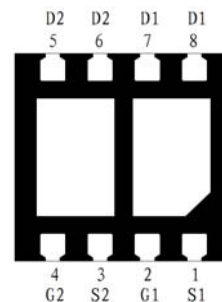
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Simplified Schematic



MARKING DIAGRAM & PIN ASSIGNMENT



Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Steady State	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current ¹	-3.5	A
I_{DM}	Pulsed Drain Current ²	-18	A
I_S	Continuous Source Current (Diode Conduction) ¹	-2	A
P_D	Maximum Power Dissipation ¹	1.1	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	$^\circ C$

Notes:

1. Surface Mounted on 1" x 1" FR4 Board, $t \leq 10$ Sec.
2. Pulse width limited by maximum junction temperature.

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
MT82P01N3	MT82P01N3	DFN3*3	-	-	3000

Thermal Characteristic

Thermal Resistance ,Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	125.5	$^{\circ}\text{C} / \text{W}$
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Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250μA	-20	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-	-0.7	-1.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-3.5A	-	75	80	mΩ
		V _{GS} =-2.5V, I _D =-3.5A	-	120	130	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-15V, I _D =-3.1A	10	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, F=1.0MHz	-	570	-	PF
Output Capacitance	C _{oss}		-	85	-	PF
Reverse Transfer Capacitance	C _{rss}		-	65	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-20V, ,R _L =2Ω V _{GS} =-10V, R _{GEN} =3Ω	-	9	-	nS
Turn-on Rise Time	t _r		-	8	-	nS
Turn-Off Delay Time	t _{d(off)}		-	28	-	nS
Turn-Off Fall Time	t _f		-	10	-	nS
Total Gate Charge	Q _g	V _{DS} =-20V, I _D =-4.5A, V _{GS} =-10V	-	12	-	nC
Gate-Source Charge	Q _{gs}		-	2.9	-	nC
Gate-Drain Charge	Q _{gd}		-	3.8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =-1A	-	-0.8	-1.2	V
Diode Forward Current (Note 2)	I _S		-	-	-3.5	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

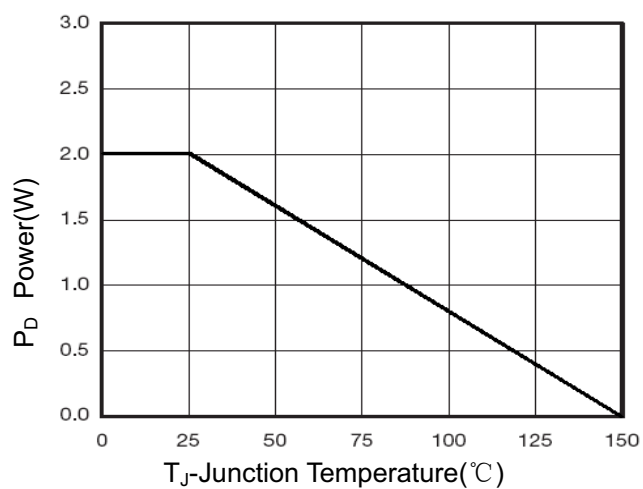


Figure 1 Power Dissipation

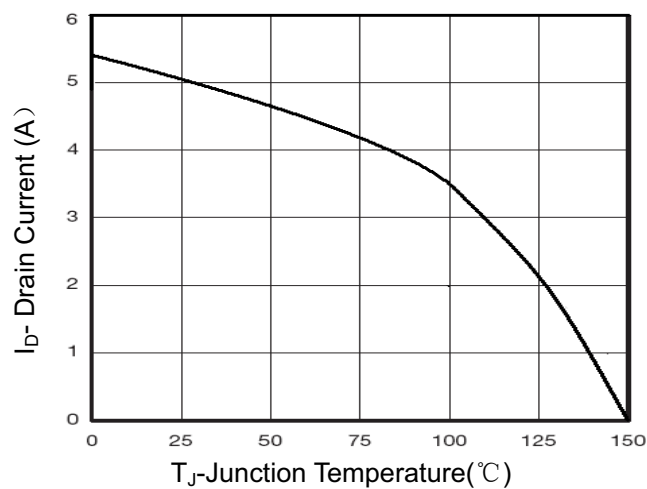


Figure 2 Drain Current

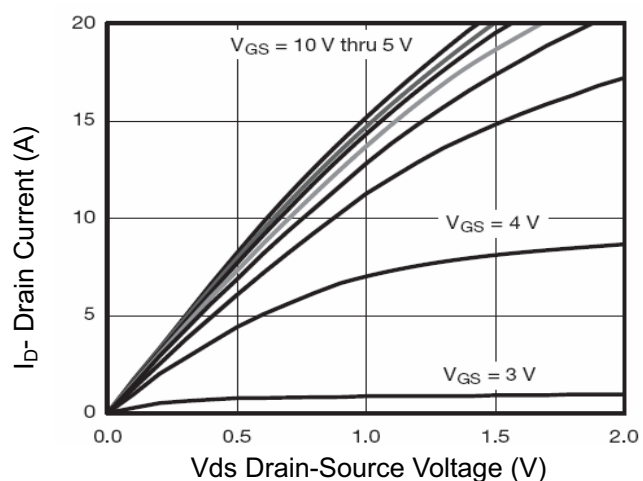


Figure 3 Output Characteristics

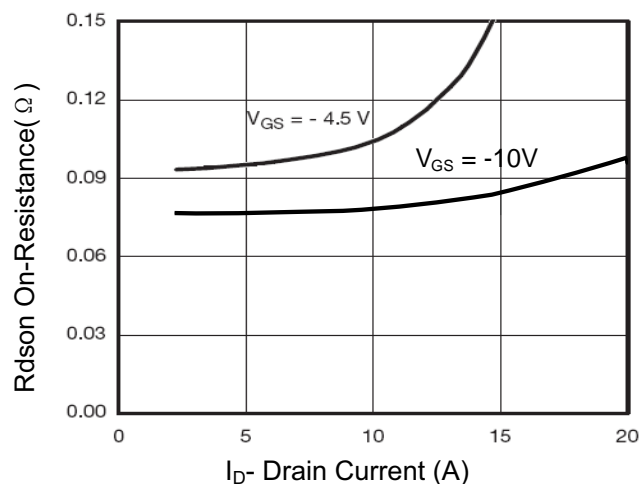


Figure 4 Drain-Source On-Resistance

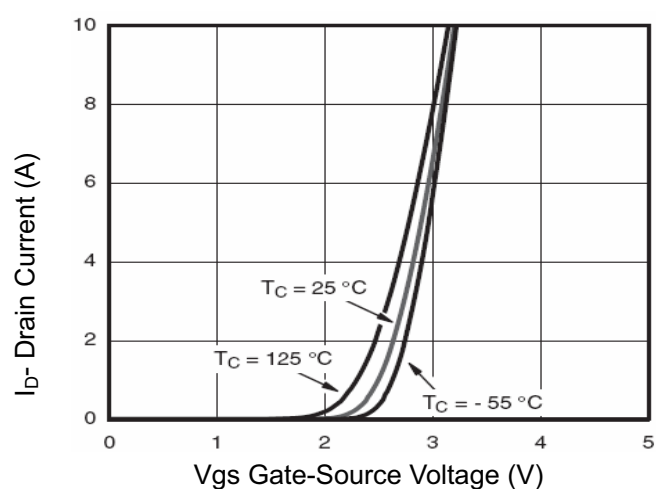


Figure 5 Transfer Characteristics

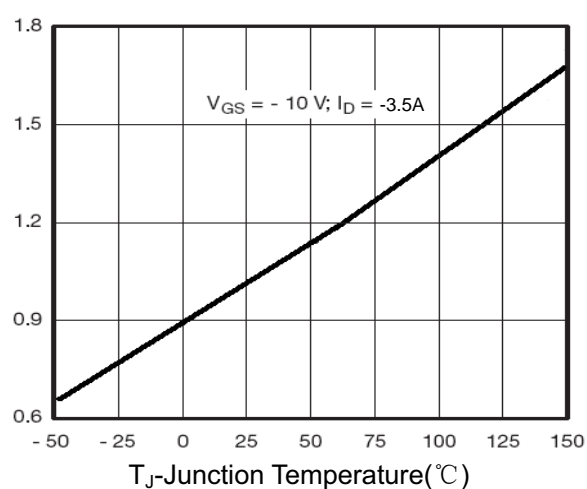


Figure 6 Drain-Source On-Resistance

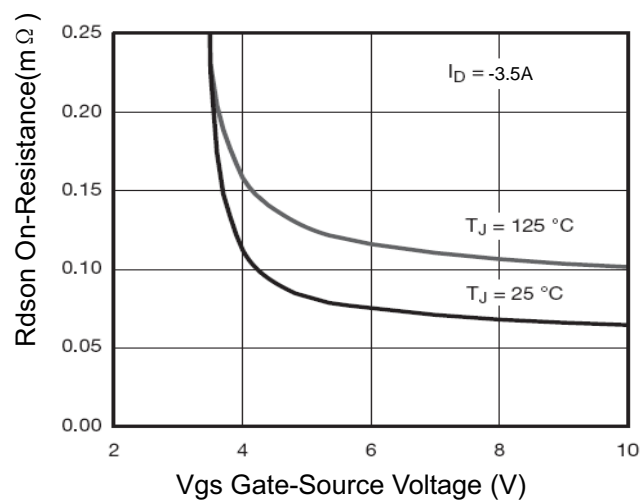


Figure 7 Rdson vs Vgs

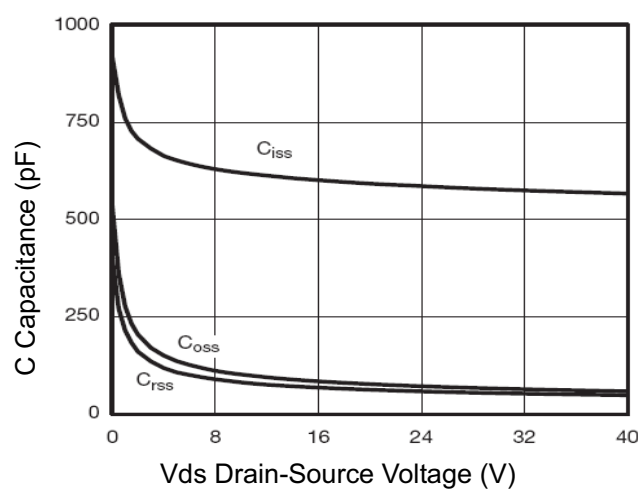


Figure 8 Capacitance vs Vds

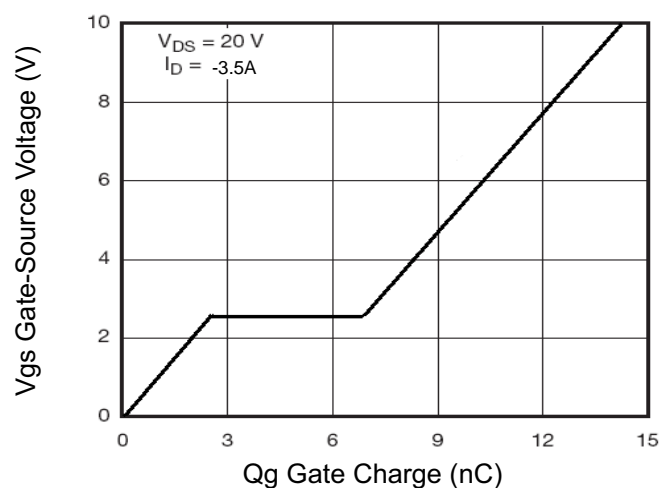


Figure 9 Gate Charge

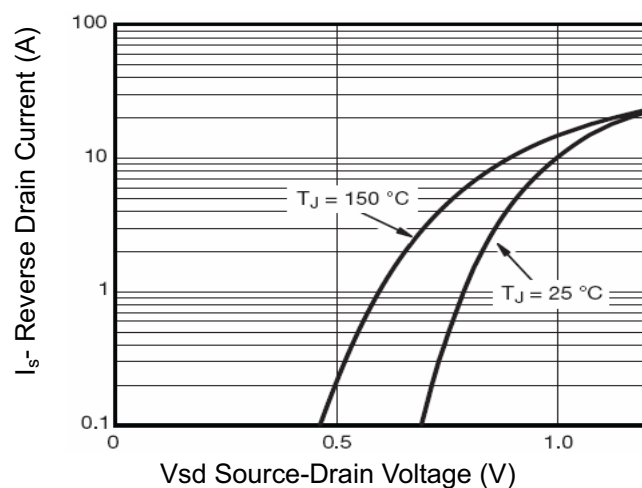


Figure 10 Source- Drain Diode Forward

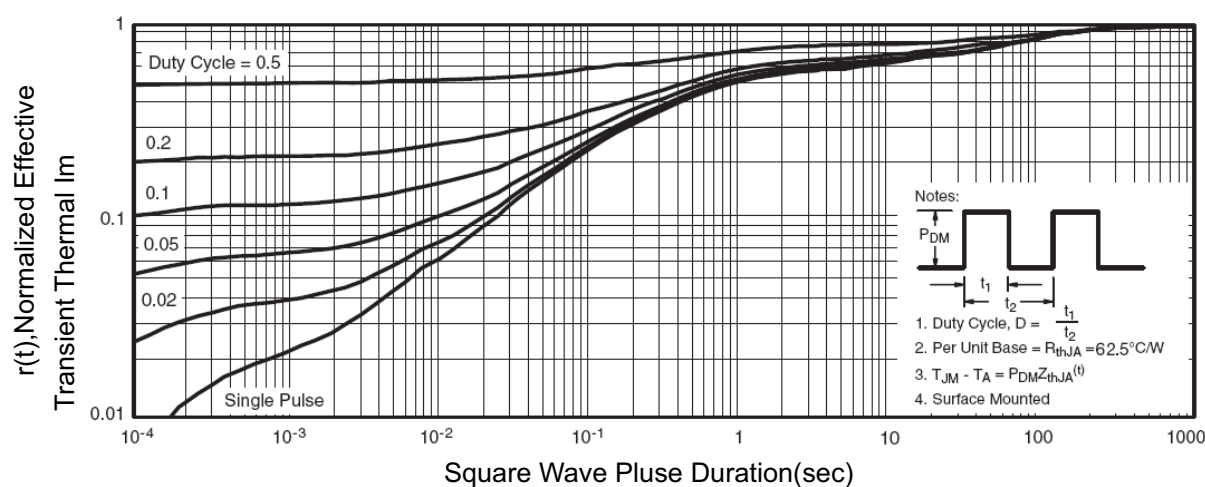
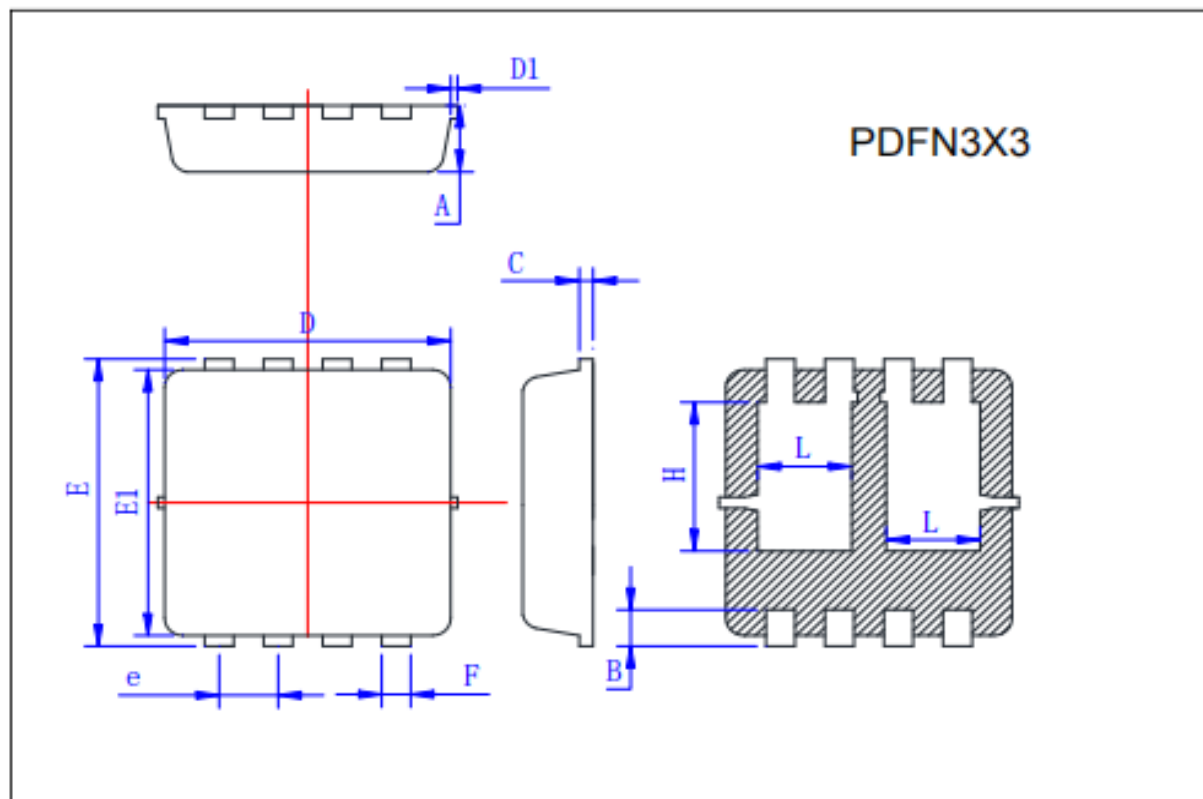


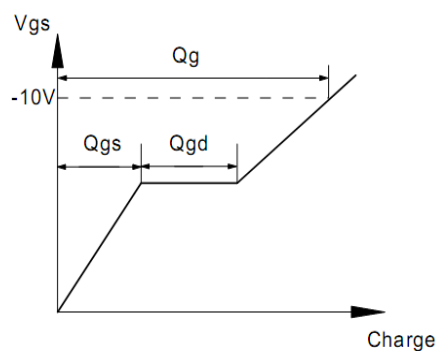
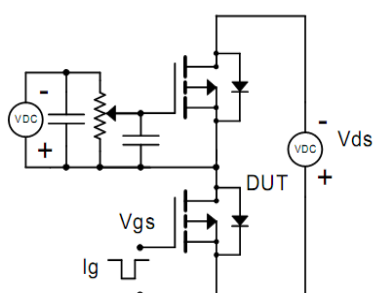
Figure 11 Normalized Maximum Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS



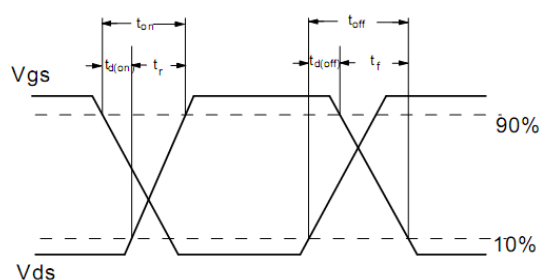
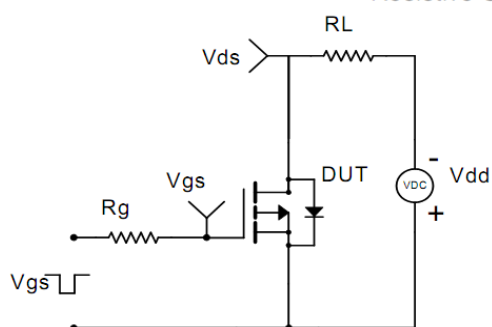
Symbol	Min	Typ	Max
A	0.725	0.775	0.825
B	0.28	0.38	0.48
C	0.13	0.15	0.20
D	3.05	3.15	3.25
D1			0.10
E	3.25	3.35	3.45
E1	3.0	3.1	3.2
e	0.60	0.65	0.70
F	0.27	0.32	0.37
H	1.63	1.73	1.83
L	0.93	1.03	1.13

Gate Charge Test Circuit & Waveform

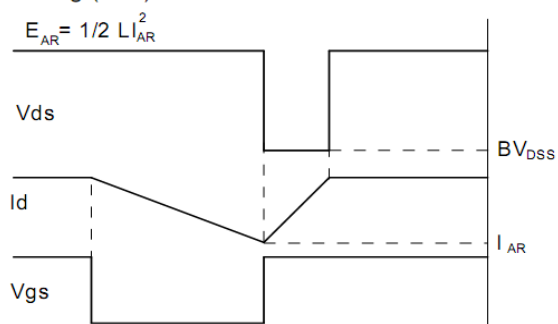
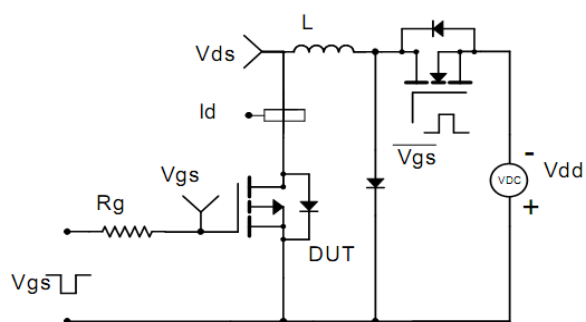


Resistive Switching Test Circuit & Waveforms

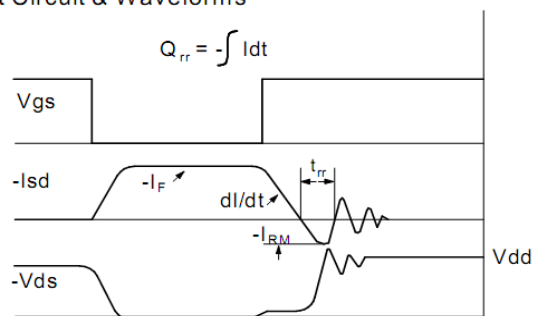
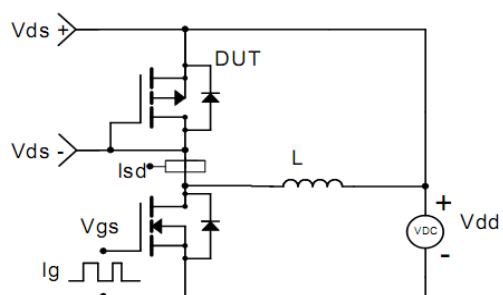
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



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