

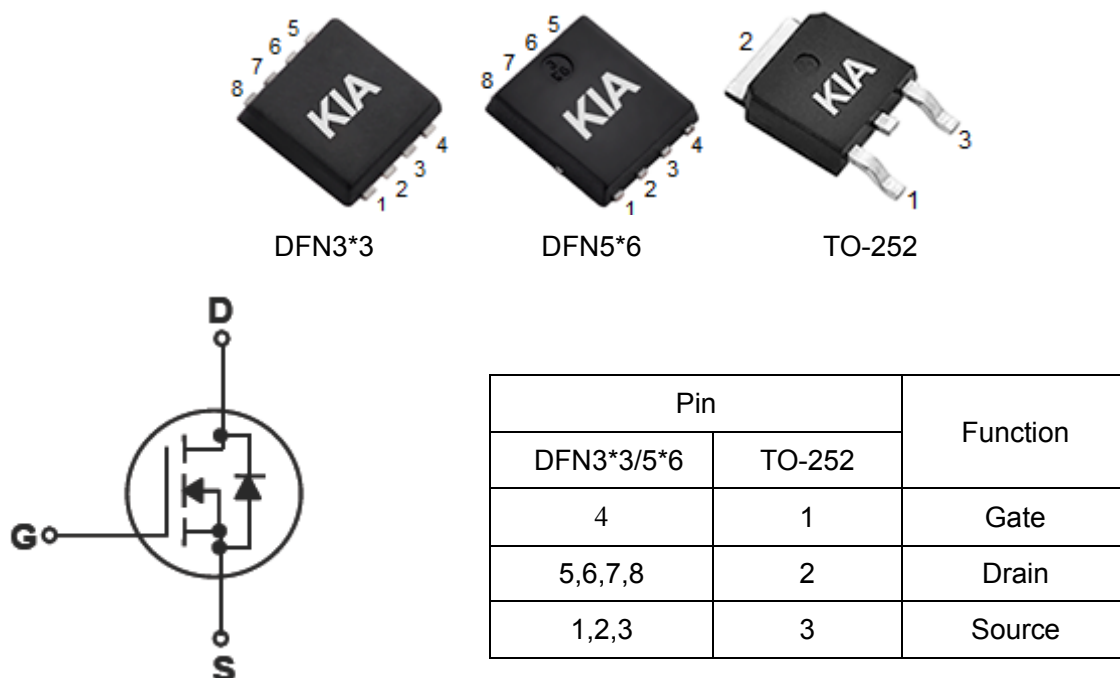
1. Features

- $R_{DS(ON)}=2.6m\Omega(\text{typ.})@V_{GS}=10V$, DFN3*3/5*6
- $R_{DS(ON)}=3.2m\Omega(\text{typ.})@V_{GS}=10V$, TO-252
- Very Low On-resistance $R_{DS(ON)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

2. Application

- PWM Application
- Load Switch
- Power Management

3. Pin configuration



4. Ordering Information

Part Number	Package	Brand
KNG3303C	DFN3*3	KIA
KNY3303C	DFN5*6	KIA
KND3303C	TO-252	KIA

5. Absolute maximum ratings

(T_C=25°C unless otherwise noted)

Parameter		Symbol	Rating		Units
			DFN3*3/5*6	TO-252	
Drain-source voltage		V _{DSS}	30		V
Continuous drain current	T _C =25°C	I _D	90		A
	T _C =100°C	I _D	59		A
Pulsed drain current	-Pulsed ¹⁾	I _{DM}	400		A
Gate-source voltage		V _{GS}	±20		V
Single pulse avalanche energy ²⁾		E _{AS}	289		mJ
Power dissipation (T _C =25°C)		P _D	66	70	W
Operating junction and storage temperature range		T _J , T _{STG}	-55 to 150		°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T _L	300		°C

*Drain current limited by maximum junction temperature.

6. Thermal Data

Parameter	Symbol	Rating		Unit
		DFN3*3/5*6	TO-252	
Thermal resistance junction-case	R _{θJC}	1.9	1.78	°C/W

7. Electrical characteristics

(T_C=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Units
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA		30	-	-	V
Drain-source leakage current	I _{DSS}	V _{DS} =30V, V _{GS} =0V		-	-	1	uA
Gate-source forward leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V		-	-	±100	nA
Gate threshold voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250uA		1.0	-	2.2	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A	DFN3*3/5*6	-	2.6	3.9	mΩ
			TO-252	-	3.2	4.0	mΩ
		V _{GS} =4.5V, I _D =15A	DFN3*3/5*6	-	3.9	5.6	mΩ
			TO-252	-	4.5	5.6	mΩ
Input capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V f=1MHz		-	3280	-	pF
Output capacitance	C _{oss}			-	360	-	pF
Reverse transfer capacitance	C _{rss}			-	320	-	pF
Turn-on delay time	t _{d(on)}	V _{GS} =10V, V _{DS} =10V R _L =3Ω, I _D =30A ³⁾			10	-	ns
Rise time	t _r				100	-	ns
Turn-off delay time	t _{d(off)}				54	-	ns
Fall time	t _f				98		ns
Total gate charge(10V)	Q _g	V _{DS} =10V, I _D =30A V _{GS} =10V ³⁾		-	60	-	nC
Gate-source charge	Q _{gs}			-	28	-	nC
Gate-drain charge	Q _{gd}			-	3	-	nC
Maximum Continuous Drain-Source Diode Forward Current	I _S	—		-	-	100	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}	—		-	-	400	A
Diode forward voltage	V _{SD}	I _{SD} =20A, V _{GS} =0V, T _J =25°C		-	-	1.2	V
Reverse recovery time	T _{rr}	I _F =20A dI/dt=100A/μs		-	20	-	ns
Reverse recovery charge	Q _{rr}	I _F =20A dI _F /dt=100A/μs		-	10	-	nC

Note:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. EAS condition: T_J=25°C, V_{DD}=15V, V_G=10V, R_G=25Ω, L=0.5mH.
3. Pulse Test: Pulse Width≤300us, Duty Cycle≤0.5%

8. Typical Electrical Characteristics

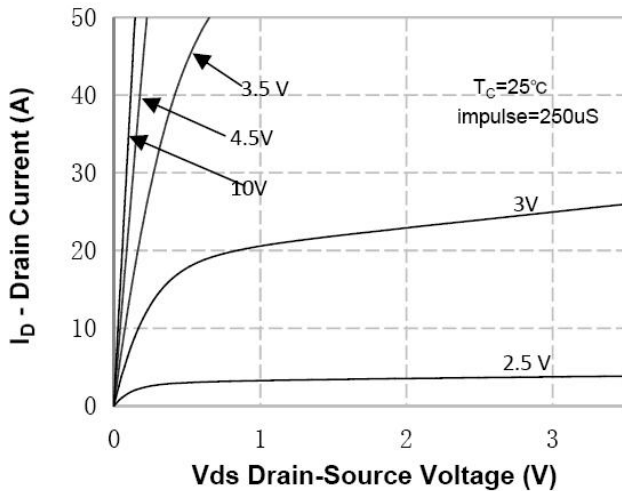


Figure 1. On-Region Characteristics

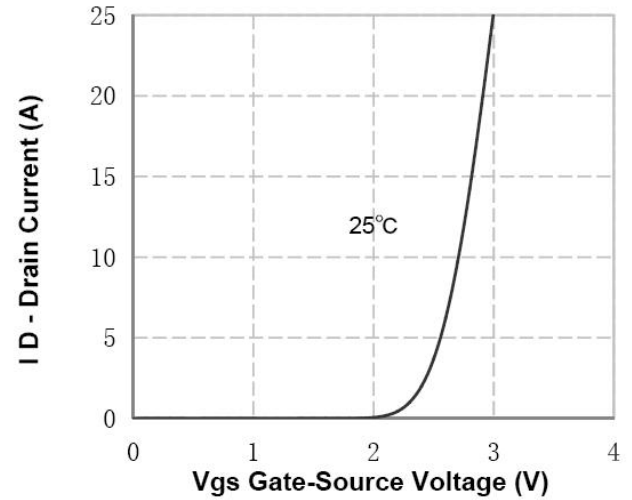


Figure 2. Transfer Characteristics

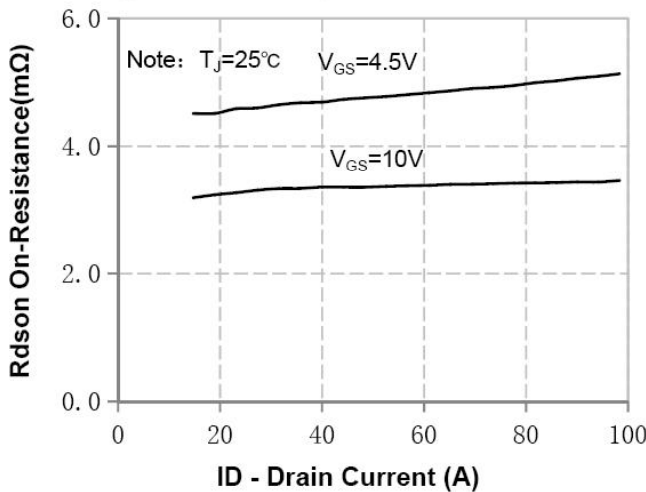


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

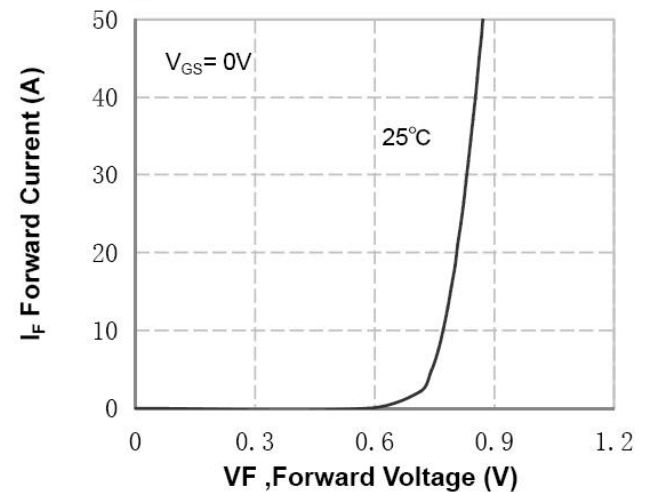


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

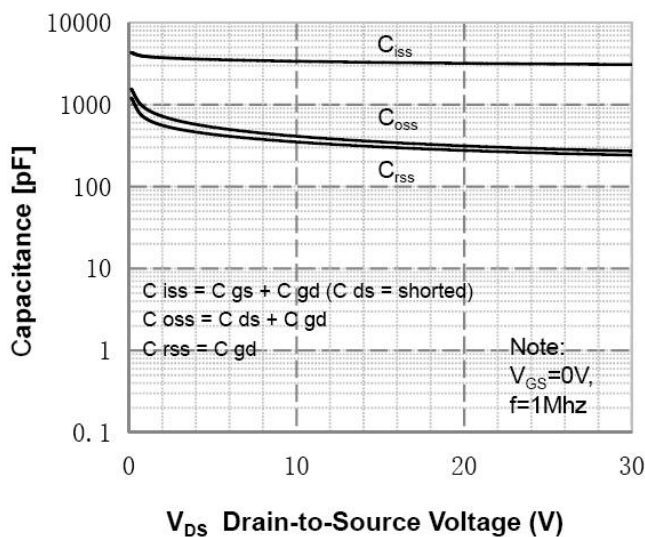


Figure 5. Capacitance Characteristics

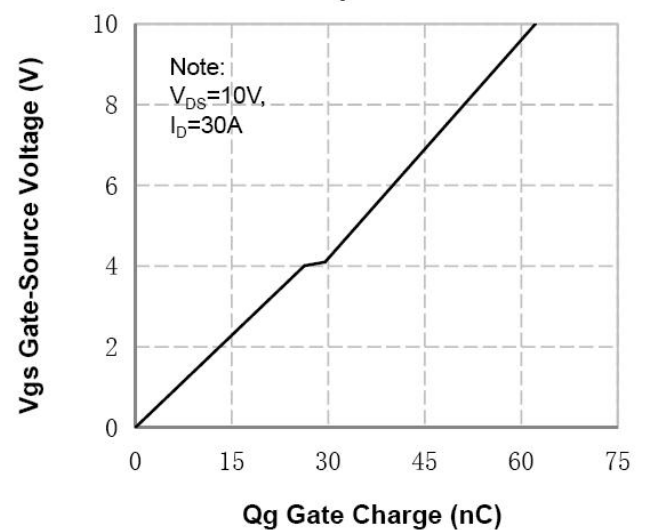


Figure 6. Gate Charge Characteristics

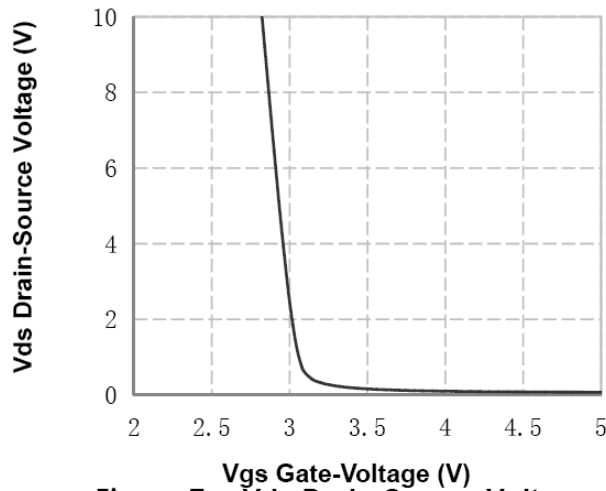


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

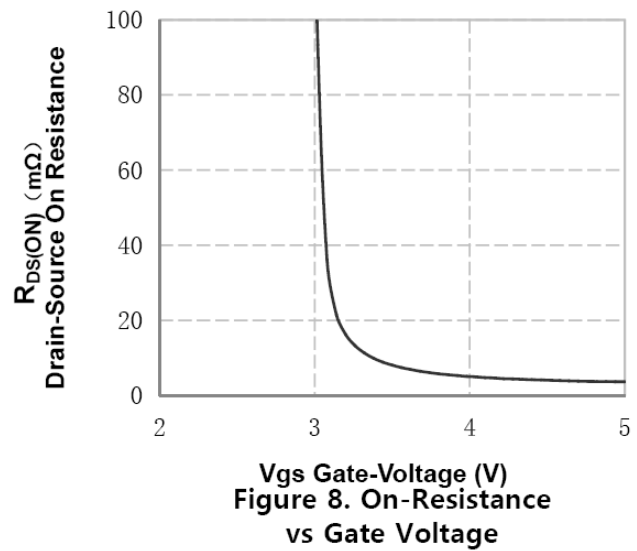


Figure 8. On-Resistance vs Gate Voltage

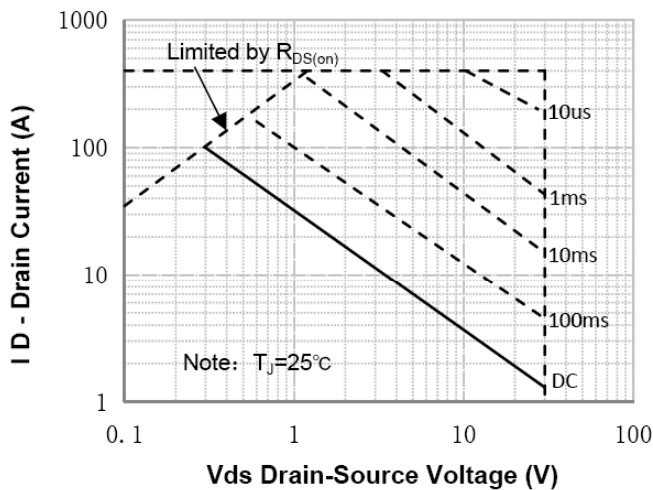


Figure 9. Maximum Safe Operating Area

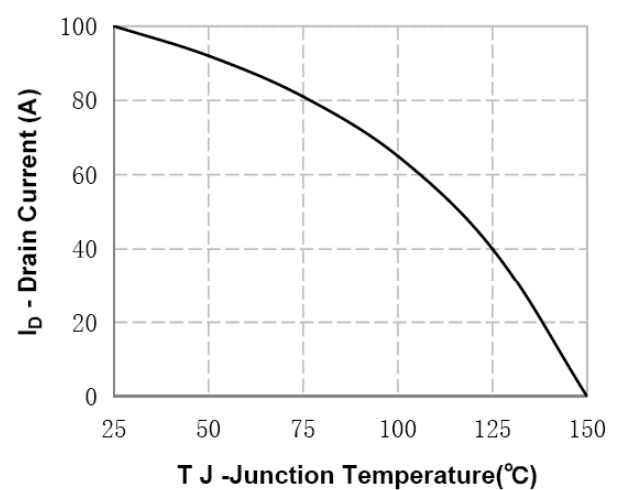


Figure 10. Maximum Continuous Drain Current vs Temperature

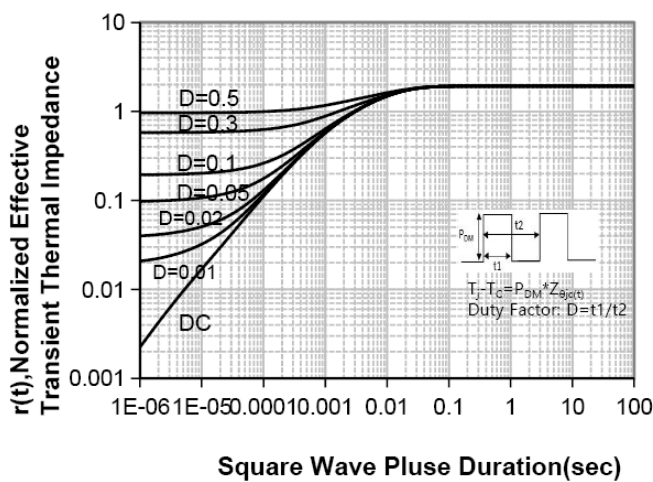


Figure 11. Transient Thermal Response Curve

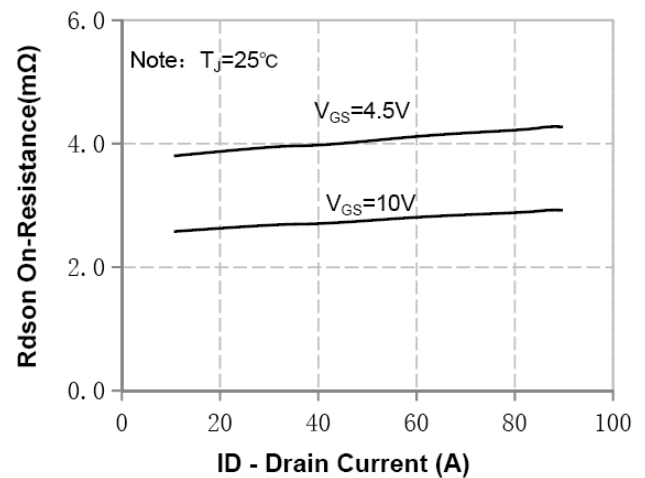
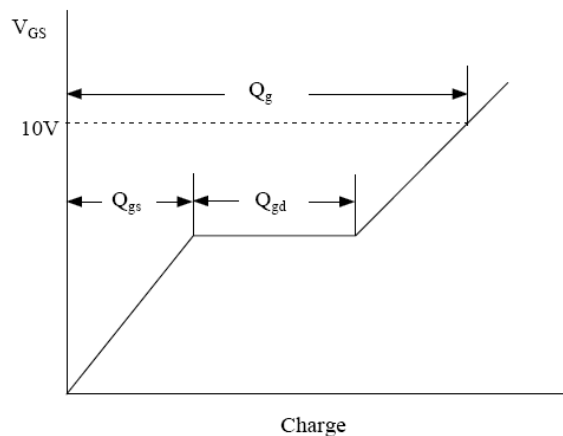
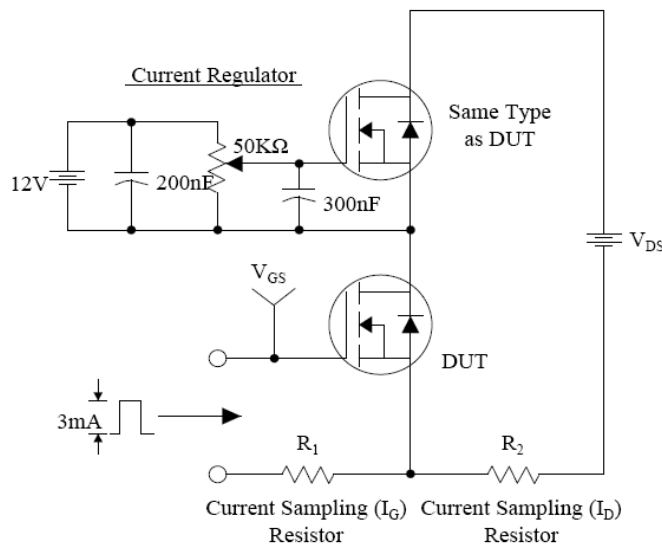


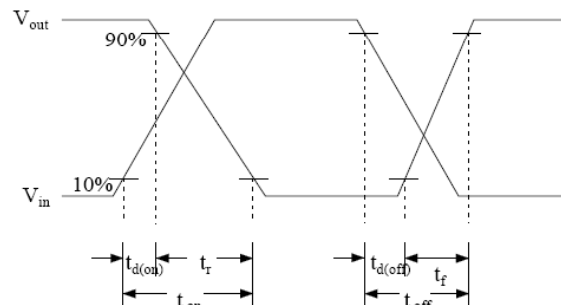
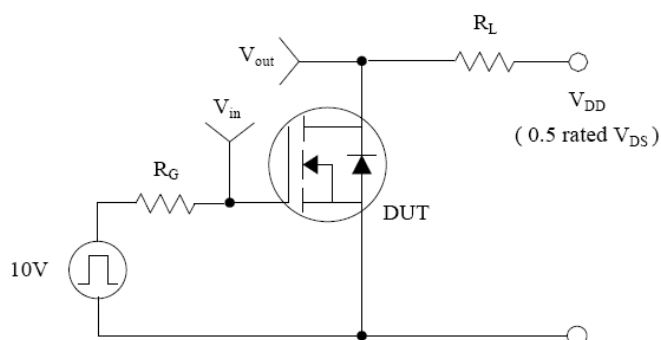
Figure 12. On-Resistance Variation vs Drain Current and Gate Voltage

9. Test Circuits and Waveforms

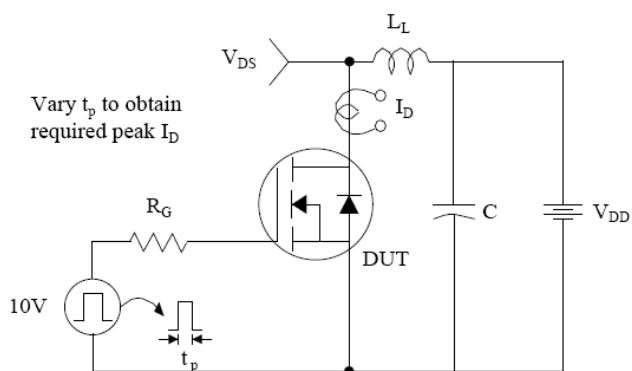
Gate Charge Test Circuit & Waveform



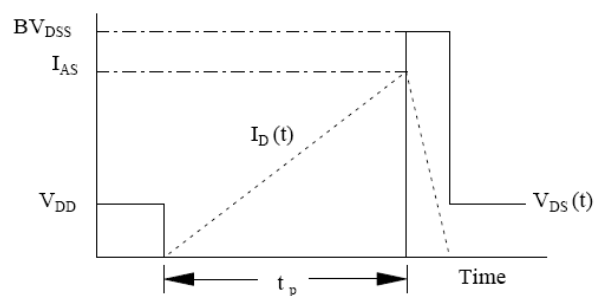
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



$$E_{AS} = \frac{1}{2} L_L I_{AS}^2$$



Peak Diode Recovery dv/dt Test Circuit & Waveforms

