

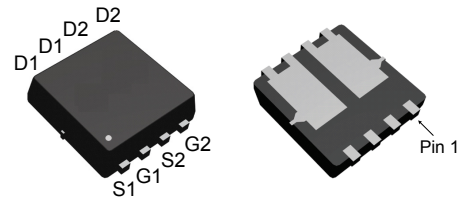
Features

- 30V/30A
 $R_{DS(ON)} = 10.2\text{m}\Omega(\text{typ.}) @ V_{GS} = 10\text{V}$
 $R_{DS(ON)} = 13\text{m}\Omega(\text{typ.}) @ V_{GS} = 4.5\text{V}$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

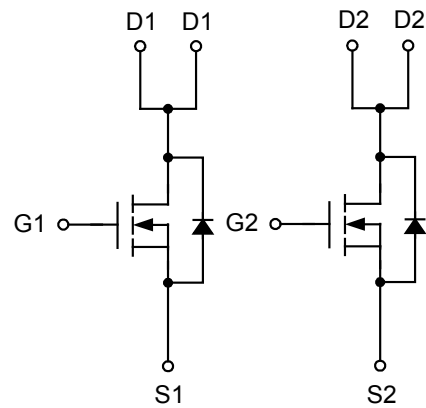
Applications

- Motor Control.
- High Current, High Speed Switching.
- Portable equipment application.

Pin Description



DFN3.3x3.3G-8_EP2



N-Channel MOSFET

Absolute Maximum Ratings (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		30	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
I _S	Diode Continuous Forward Current	T _C =25°C	8 ^a	A
I _D	Continuous Drain Current	T _C =25°C	30 ^a	A
		T _C =100°C	18 ^a	
I _{DM} ^b	Pulsed Drain Current	T _C =25°C	32 ^a	A
P _D	Maximum Power Dissipation	T _C =25°C	21	W
		T _C =100°C	8.3	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	6	°C/W
I _D ^c	Continuous Drain Current	T _A =25°C	8	A
		T _A =70°C	6.4	
I _{DM} ^b	Pulsed Drain Current	T _A =25°C	32	A
P _D ^c	Maximum Power Dissipation	T _A =25°C	1.3	W
		T _A =70°C	0.83	
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	55	°C/W
		Steady State	96	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.1mH	19	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.1mH	18	mJ

Note a : Max. continuous current is limited by bonding wire.

Note b : Pulse width is limited by max. junction temperature.

Note c : Surface mounted on 1in² pad area, steady state t = 999s.

Note d : UIS tested and pulse width limited by maximum junction temperature (initial temperature T_J=25°C).

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

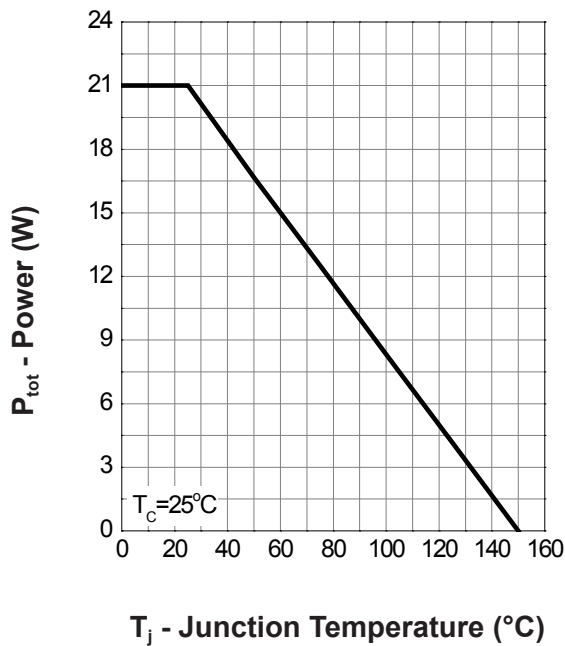
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.3	1.8	2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^e	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =30A T _J =125°C V _{GS} =4.5V, I _{DS} =27A	- - -	10.2 16 13	12.8 - 17.6	mΩ
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =30A	-	12.5	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =8A, V _{GS} =0V	-	0.82	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =8A, dI _{SD} /dt=100A/μs	-	11.8	-	ns
t _a	Charge Time		-	7	-	
t _b	Discharge Time		-	5.5	-	
Q _{rr}	Reverse Recovery Charge		-	5	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	2.1	4.2	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	833	1083	pF
C _{oss}	Output Capacitance		-	130	-	
C _{rss}	Reverse Transfer Capacitance		-	73	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	8	15	ns
t _r	Turn-on Rise Time		-	9.4	17	
t _{d(OFF)}	Turn-off Delay Time		-	23.4	43	
t _f	Turn-off Fall Time		-	5.2	10	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =30A	-	15.3	21.42	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =30A	-	7	-	
Q _{gth}	Threshold Gate Charge		-	1.5	-	
Q _{gs}	Gate-Source Charge		-	2.9	-	
Q _{gd}	Gate-Drain Charge		-	2.4	-	

Note e : Pulse test ; pulse width $\leq 300\text{ms}$, duty cycle $\leq 2\%$.

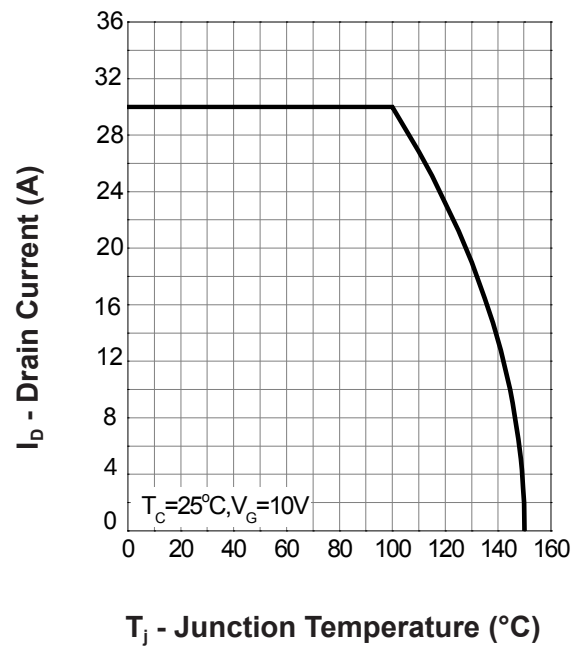
Note f : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

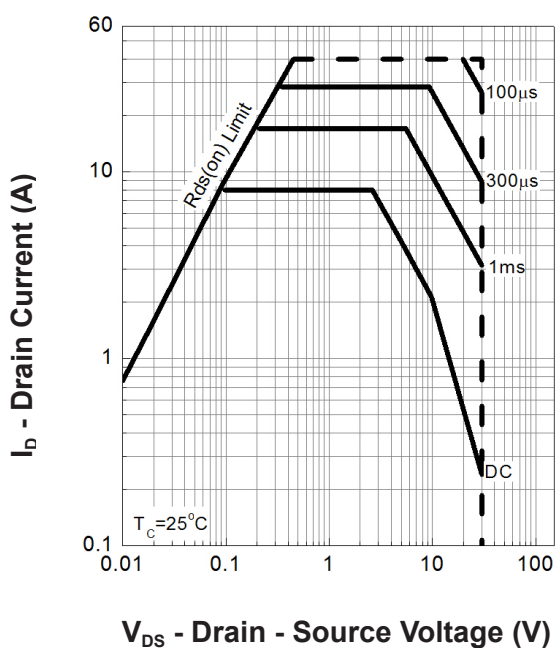
Power Dissipation



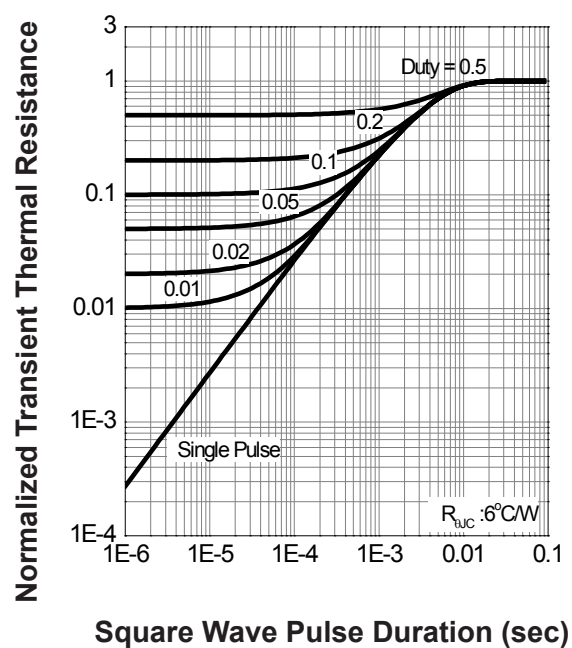
Drain Current



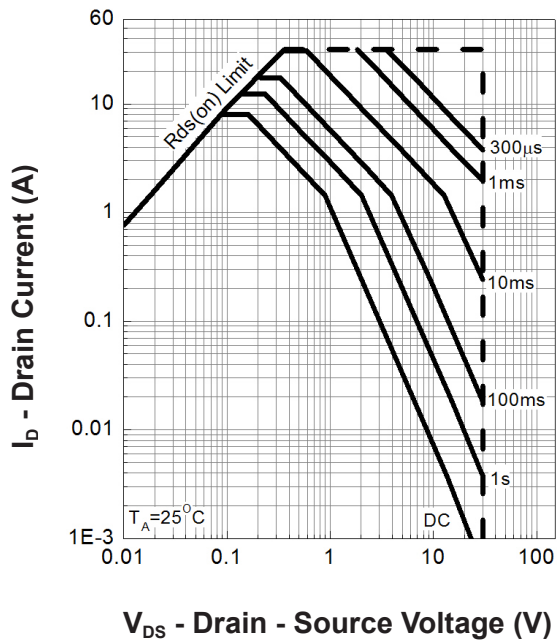
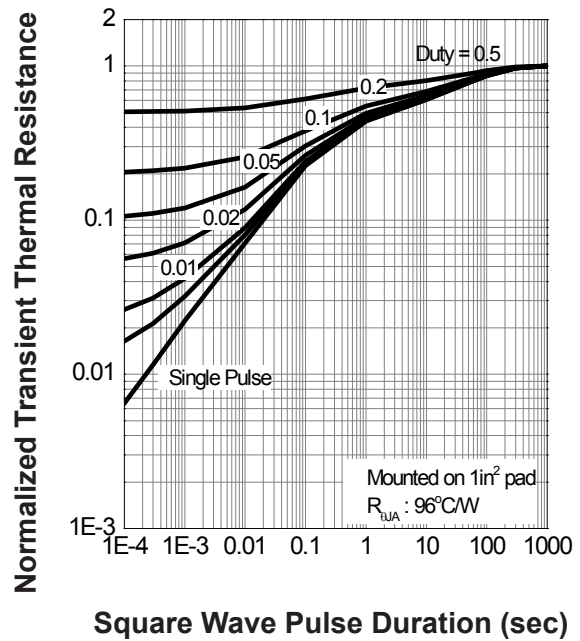
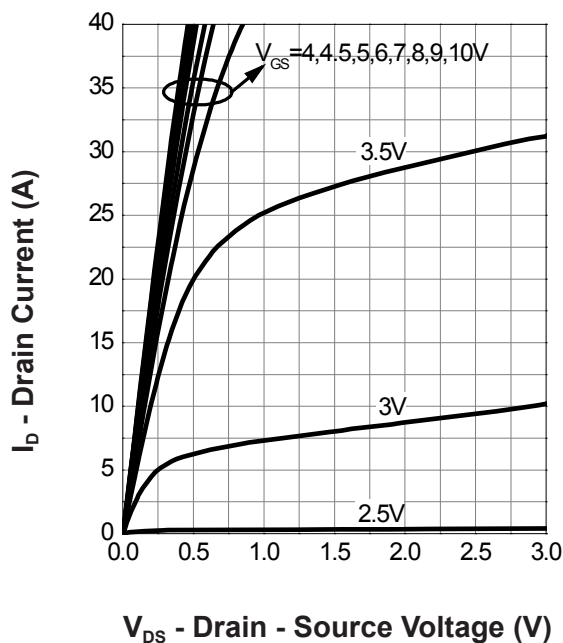
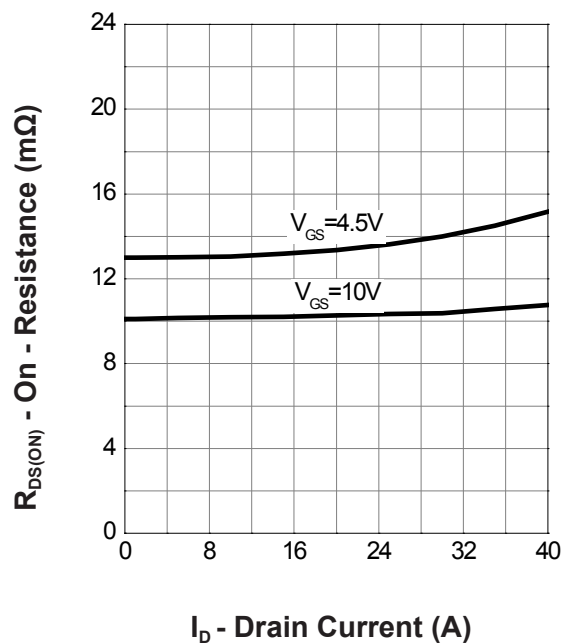
Safe Operation Area



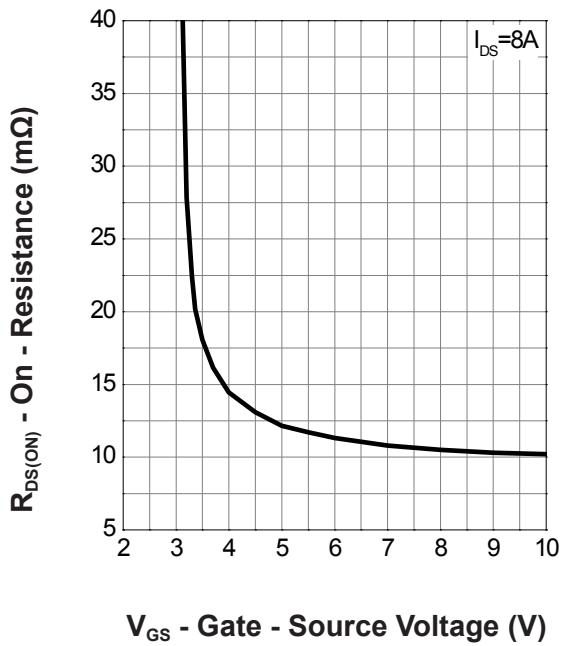
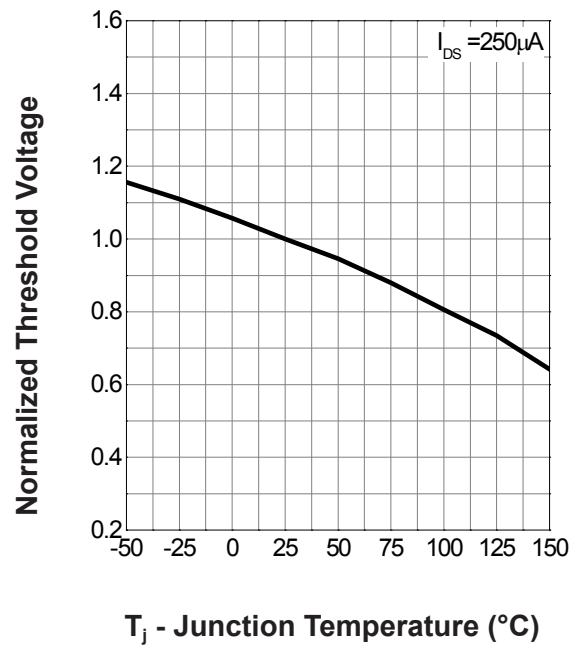
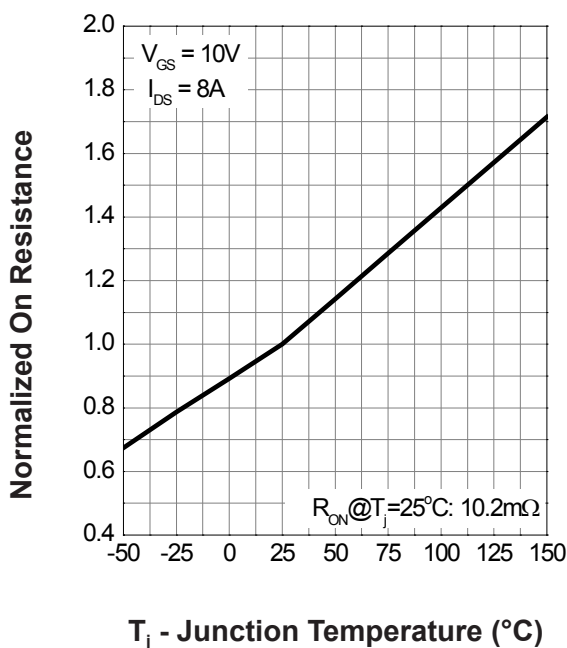
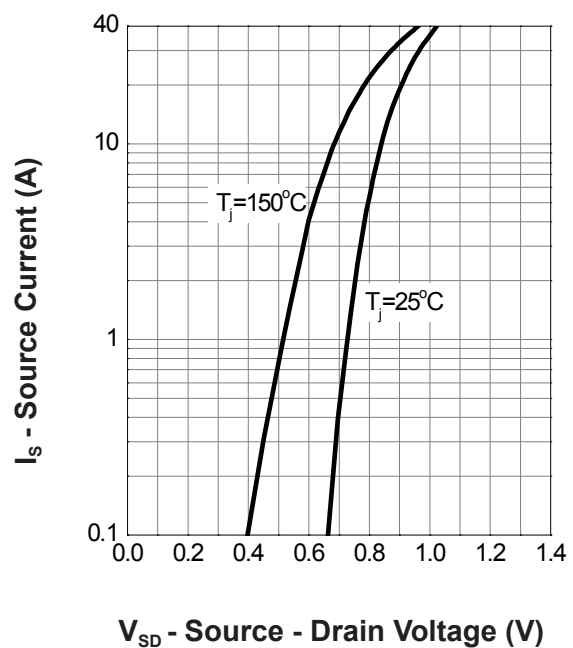
Thermal Transient Impedance



Typical Operating Characteristics(Cont.)

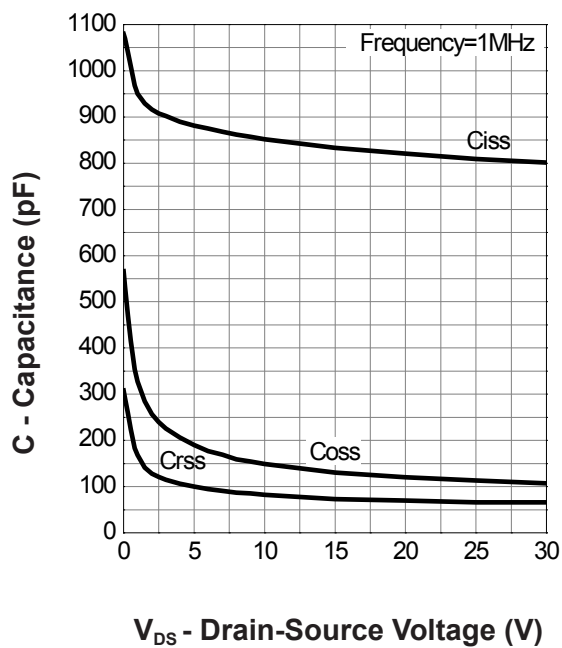
Safe Operation Area

Thermal Transient Impedance

Output Characteristics

Drain-Source On Resistance


Typical Operating Characteristics(Cont.)

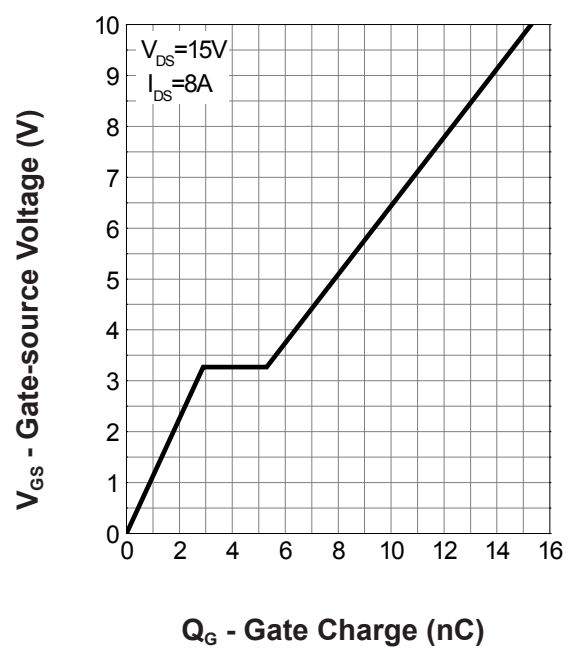
Gate-Source On Resistance

Gate Threshold Voltage

Drain-Source On Resistance

Source-Drain Diode Forward


Typical Operating Characteristics(Cont.)

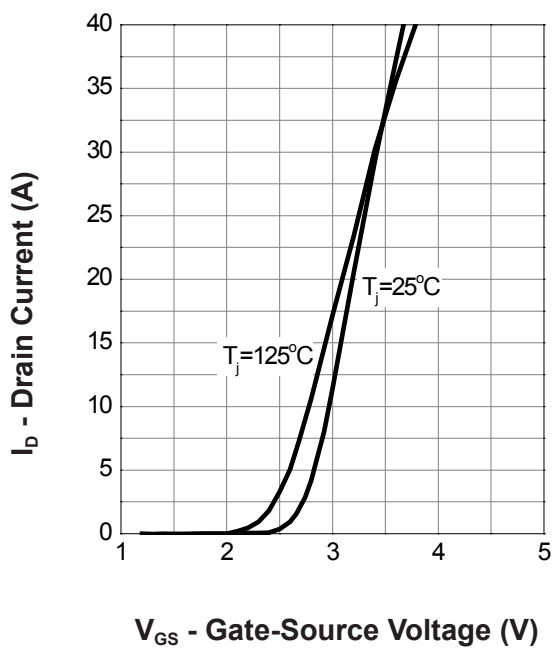
Capacitance



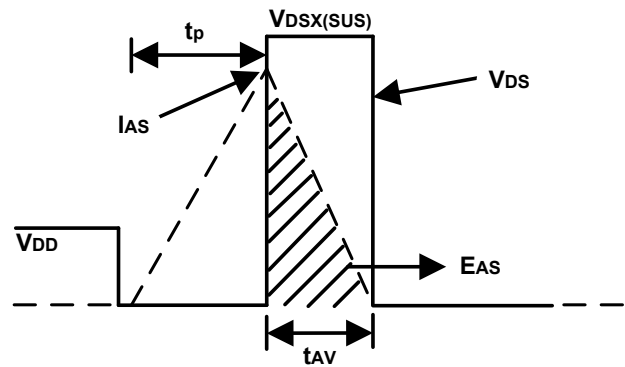
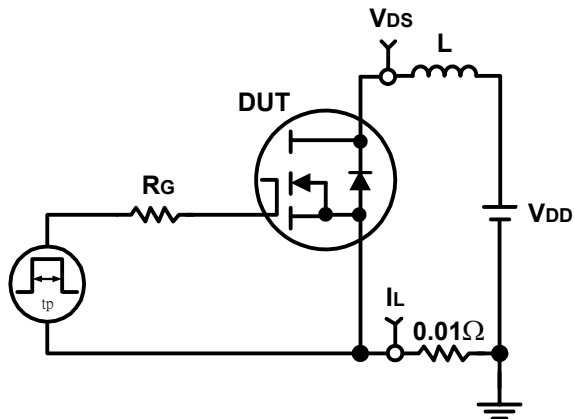
Gate Charge



Transfer Characteristics



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

