

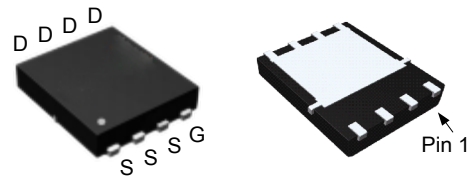
Features

- 40V/100A,
 $R_{DS(ON)} = 1.6m\Omega$ (Max.) @ $V_{GS}=10V$
 $R_{DS(ON)} = 2.1m\Omega$ (Max.) @ $V_{GS}=4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lower Q_g and Q_{gd} for high-speed switching
- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- Lead Free and Green Devices Available (RoHS Compliant)
- Moisture Sensitivity Level MSL1 (per JEDEC J-STD-020D)

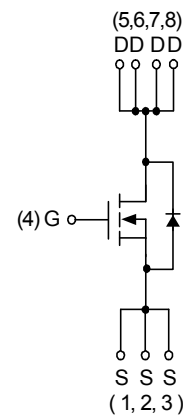
Applications

- Power Management in Desktop Computer or DC/DC Converters.

Pin Description



DFN5x6A-8_EP



N-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
Common Ratings			
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	± 20	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 47	A
I_D^a	Continuous Drain Current	$T_C=25^\circ\text{C}$ 100 ^a	
		$T_C=100^\circ\text{C}$ 100 ^a	
I_{DM}^b	Pulsed Drain Current	$T_C=25^\circ\text{C}$ 400	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 104	W
		$T_C=100^\circ\text{C}$ 52.1	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State 1.44	$^\circ\text{C/W}$
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$ 25.3	A
		$T_A=70^\circ\text{C}$ 21.2	
I_{DM}^b	Pulsed Drain Current	$T_A=25^\circ\text{C}$ 101	A
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 2.5	W
		$T_A=70^\circ\text{C}$ 1.75	
$R_{\theta JA}^c$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$ 24	$^\circ\text{C/W}$
		Steady State 60	
I_{AS}^d	Avalanche Current, Single pulse	$L=0.1\text{mH}$ 65	A
E_{AS}^d	Avalanche Energy, Single pulse	$L=0.1\text{mH}$ 211	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 $t = 999\text{s}$.

Note d : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J=25^\circ\text{C}$).

Electrical Characteristics (T_A = 25°C unless otherwise noted)

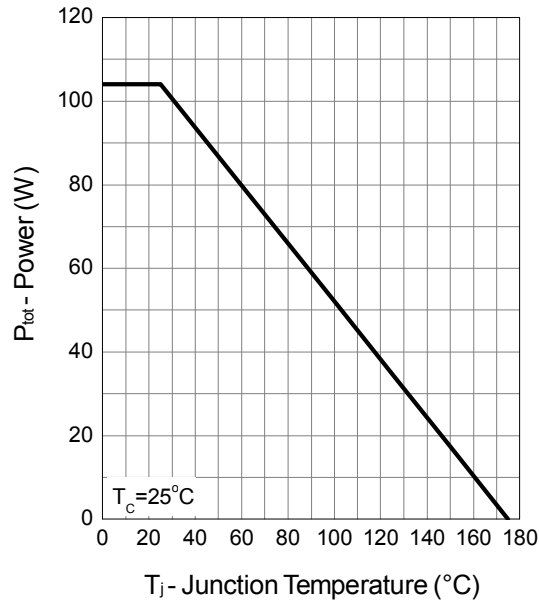
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.3	1.7	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} =25A V _{GS} =4.5V, I _{DS} =15A	-	1.3 1.6	1.6 2.1	mΩ
G _{fs}	Forward Transconductance	V _{DS} =5V, I _{DS} =15A	-	60	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =25A, V _{GS} =0V	-	0.75	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =25A, dI _{SD} /dt=100A/μs	-	51	-	ns
t _a	Charge Time		-	27	-	
t _b	Discharge Time		-	25	-	
Q _{rr}	Reverse Recovery Charge		-	51	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1	2	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	4945	6429	pF
C _{oss}	Output Capacitance		-	1280	-	
C _{rss}	Reverse Transfer Capacitance		-	165	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =20Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	21.5	39	ns
t _r	Turn-on Rise Time		-	13	24	
t _{d(OFF)}	Turn-off Delay Time		-	93	168	
t _f	Turn-off Fall Time		-	87	157	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =25A	-	78	109.2	nC
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =4.5V, I _{DS} =25A	-	36	-	
Q _{gth}	Threshold Gate Charge		-	8	-	
Q _{gs}	Gate-Source Charge		-	14	-	
Q _{gd}	Gate-Drain Charge		-	9.6	-	

Note e : Pulse test ; pulse width≤300μs, duty cycle≤2%.

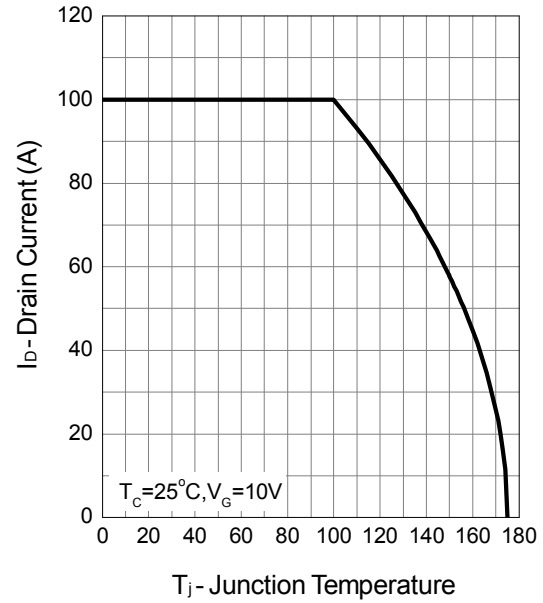
Note f : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

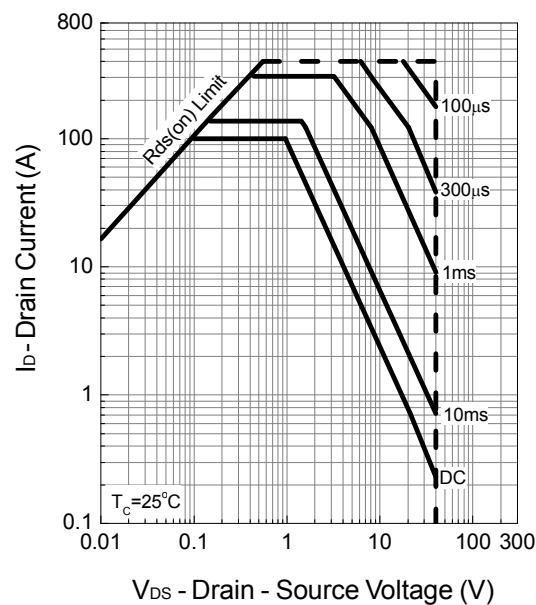
Power Dissipation



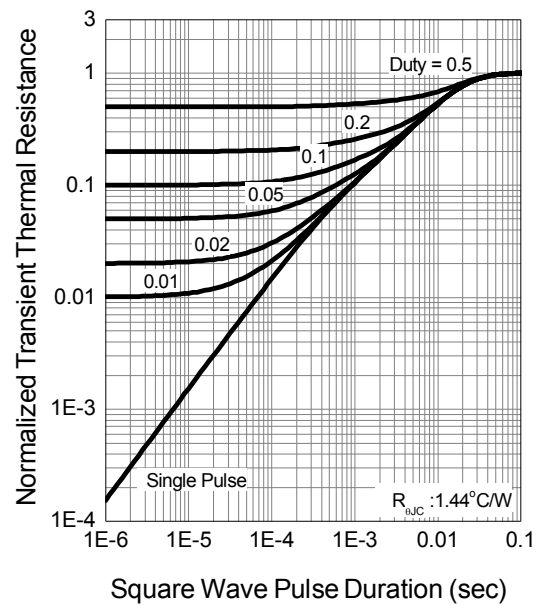
Drain Current



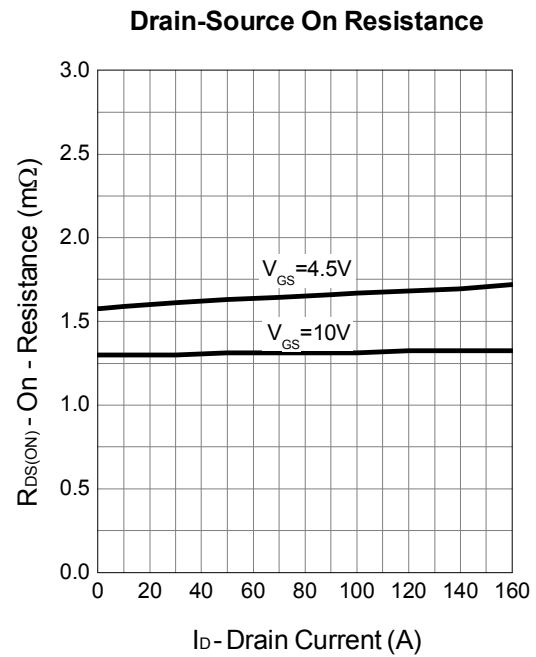
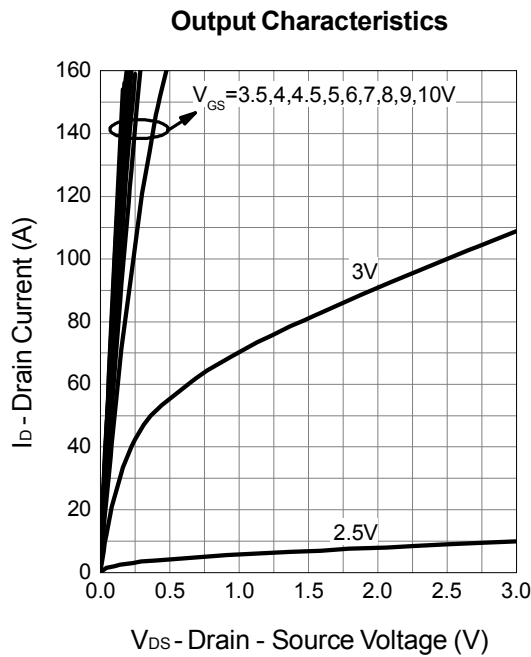
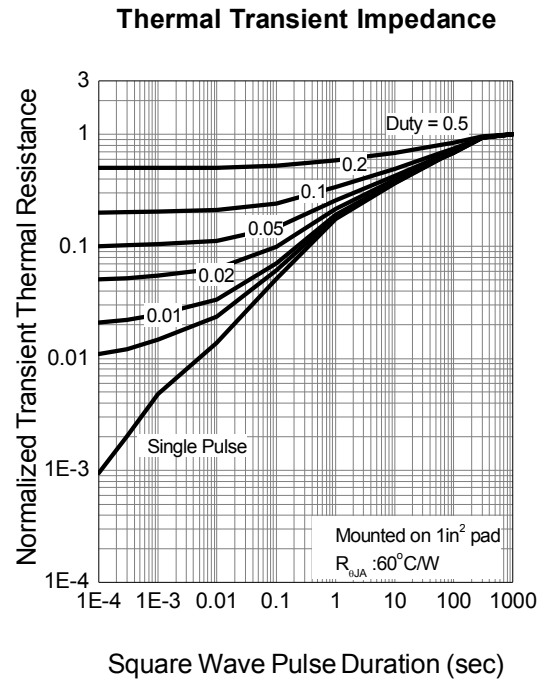
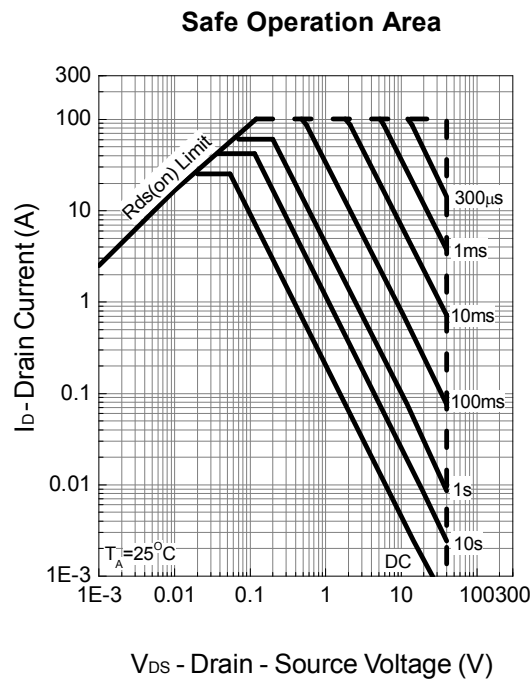
Safe Operation Area



Thermal Transient Impedance

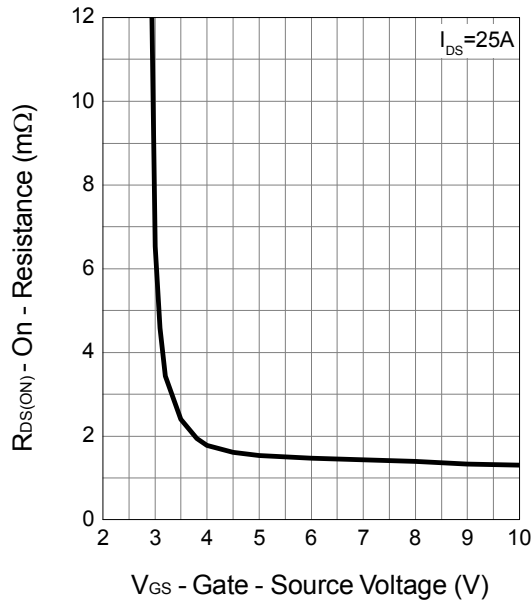


Typical Operating Characteristics (Cont.)

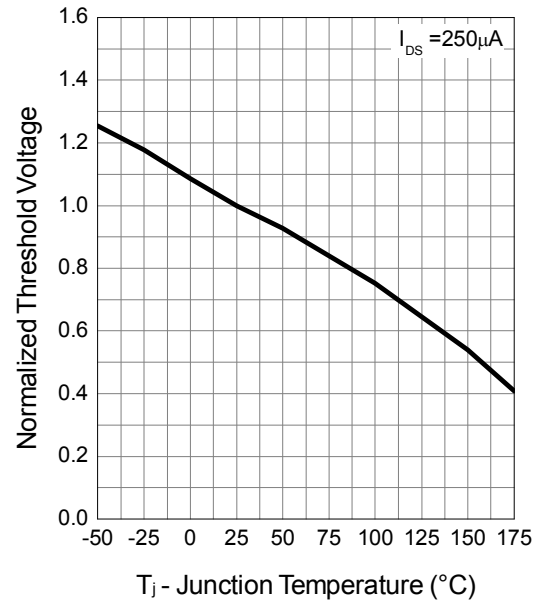


Typical Operating Characteristics (Cont.)

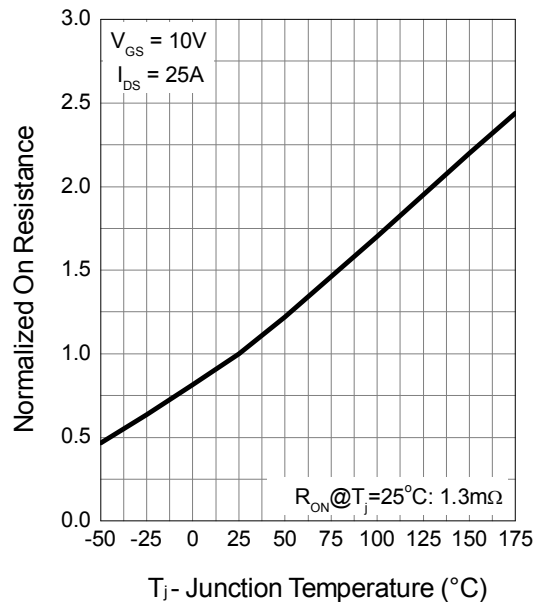
Gate-Source On Resistance



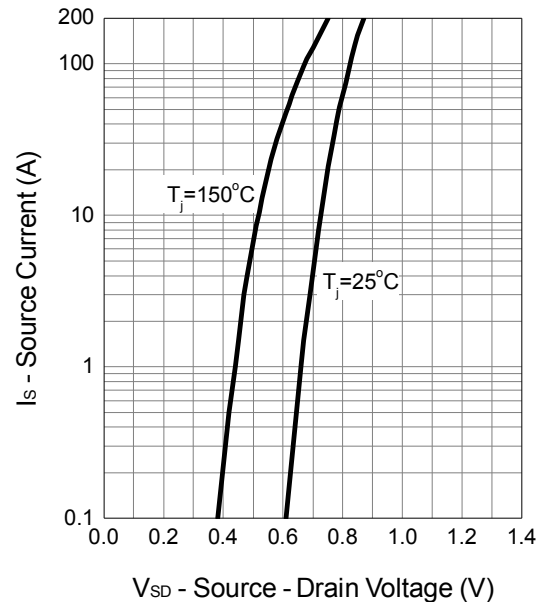
Gate Threshold Voltage



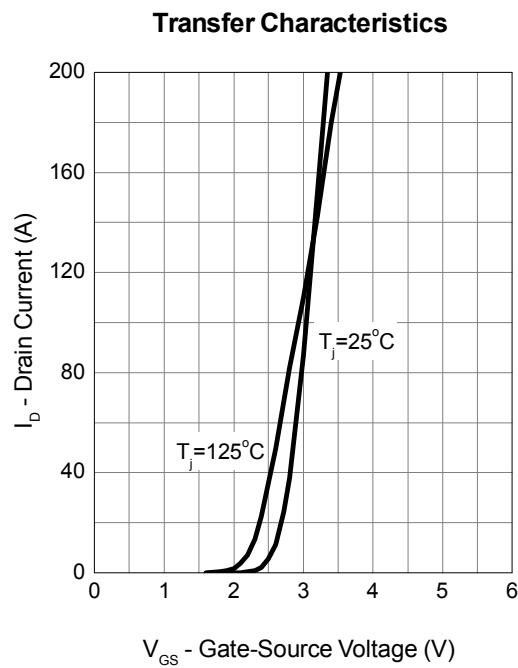
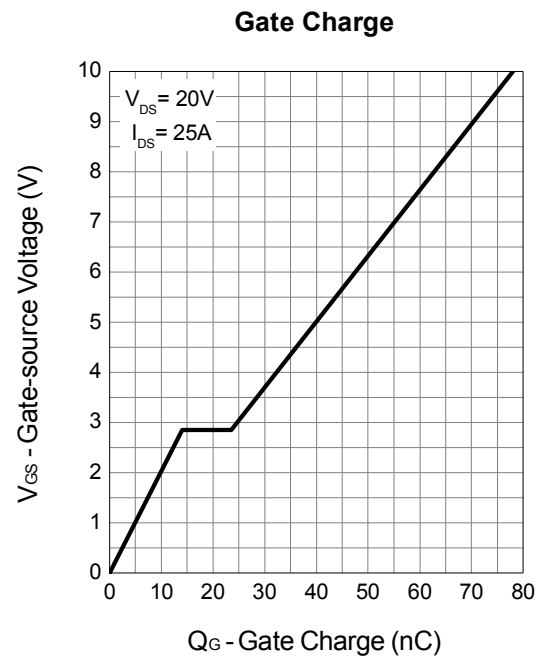
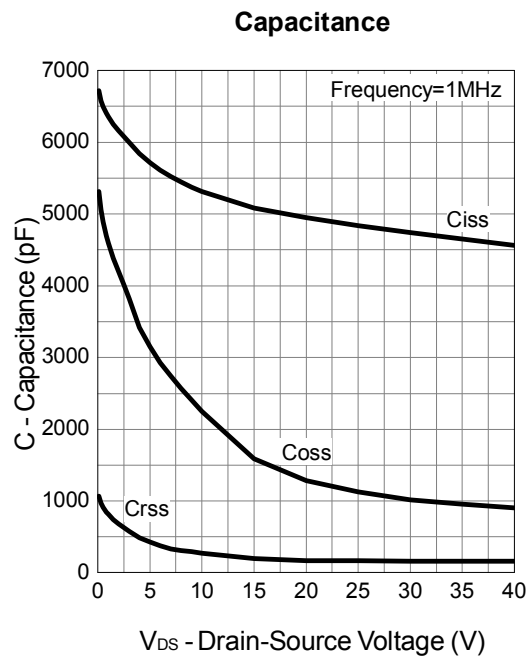
Drain-Source On Resistance



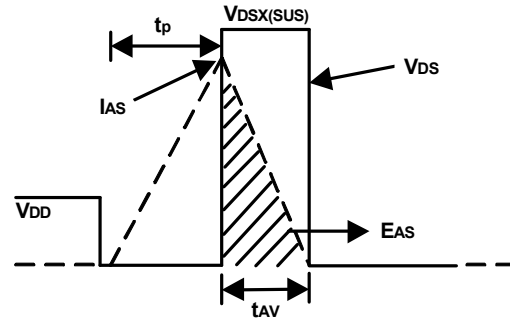
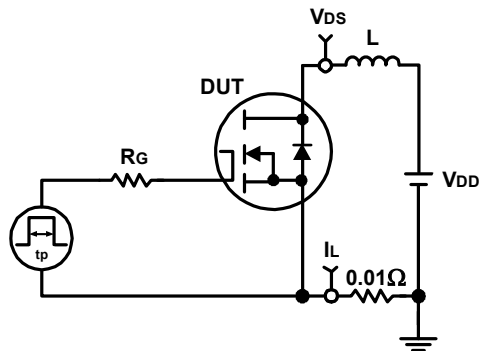
Source-Drain Diode Forward



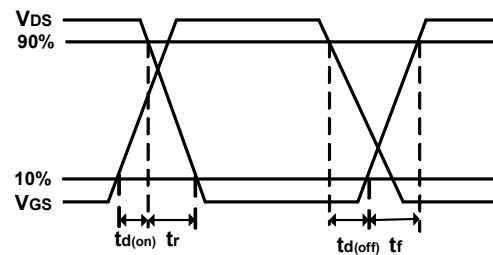
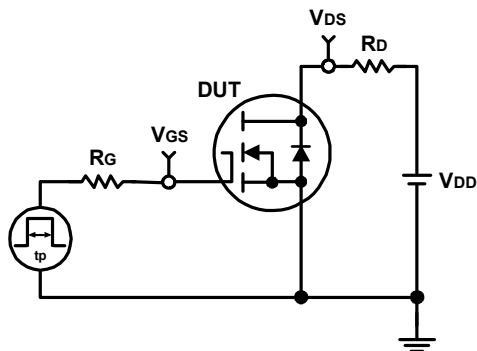
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Classification Profile

