

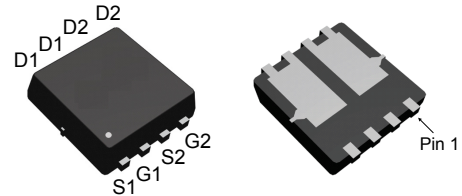
Features

- 30V/20A
 $R_{DS(ON)} = 8.2\text{m}\Omega(\text{typ.}) @ V_{GS} = 10\text{V}$
 $R_{DS(ON)} = 11\text{m}\Omega(\text{typ.}) @ V_{GS} = 4.5\text{V}$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

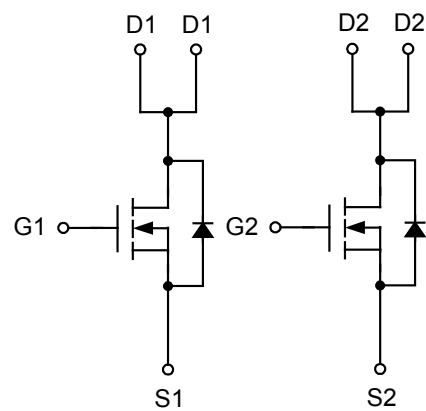
Applications

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

Pin Description



DFN3.3x3.3G-8_EP2



N-Channel MOSFET

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ 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	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	
I_S	Diode Continuous Forward Current	$T_C=25^{\circ}\text{C}$	A
I_D	Continuous Drain Current	$T_C=25^{\circ}\text{C}$	A
		$T_C=100^{\circ}\text{C}$	
I_{DM}^{b}	Pulsed Drain Current	$T_C=25^{\circ}\text{C}$	A
P_D	Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	W
		$T_C=100^{\circ}\text{C}$	
$R_{\theta\text{JC}}$	Thermal Resistance-Junction to Case	Steady State	$^{\circ}\text{C/W}$
I_D^{c}	Continuous Drain Current	$T_A=25^{\circ}\text{C}$	A
		$T_A=70^{\circ}\text{C}$	
I_{DM}^{b}	Pulsed Drain Current	$T_A=25^{\circ}\text{C}$	A
P_D^{c}	Maximum Power Dissipation	$T_A=25^{\circ}\text{C}$	W
		$T_A=70^{\circ}\text{C}$	
$R_{\theta\text{JA}}^{\text{c}}$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	$^{\circ}\text{C/W}$
		Steady State	
I_{AS}^{d}	Avalanche Current, Single pulse	$L=0.1\text{mH}$	A
E_{AS}^{d}	Avalanche Energy, Single pulse	$L=0.1\text{mH}$	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 1in^2 pad area, steady state $t = 999\text{s}$.

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

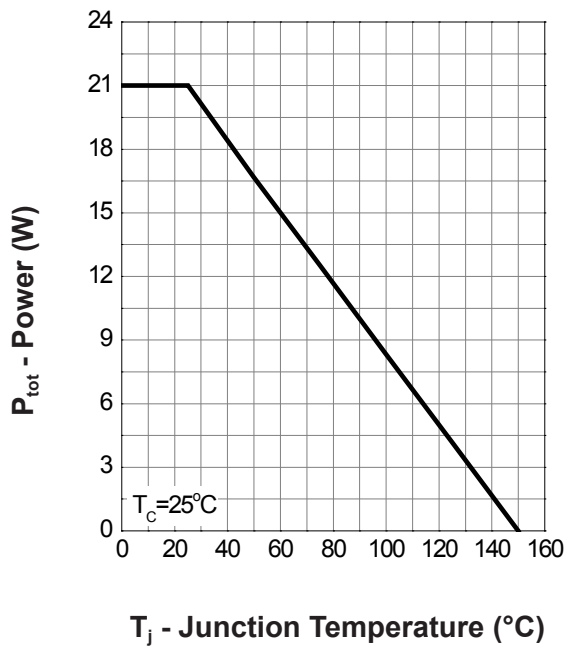
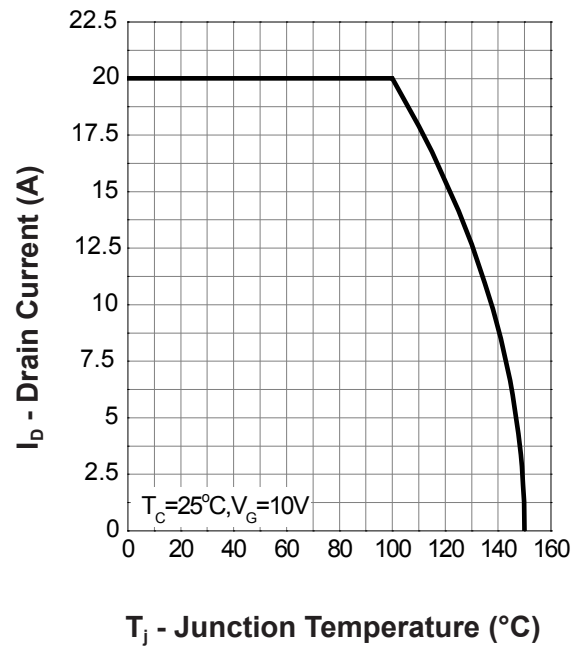
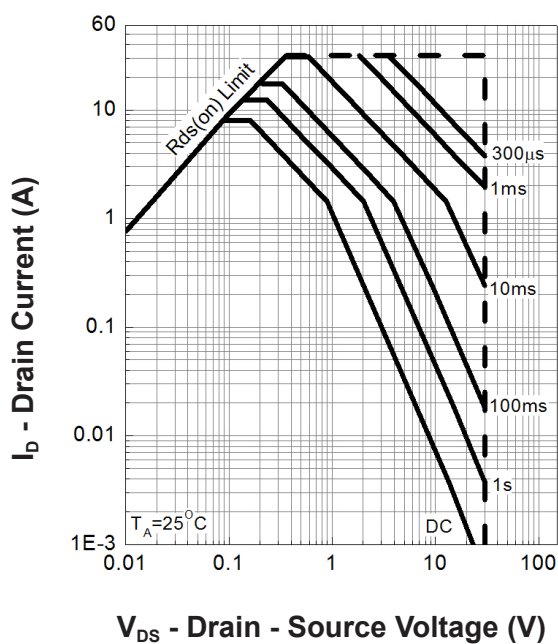
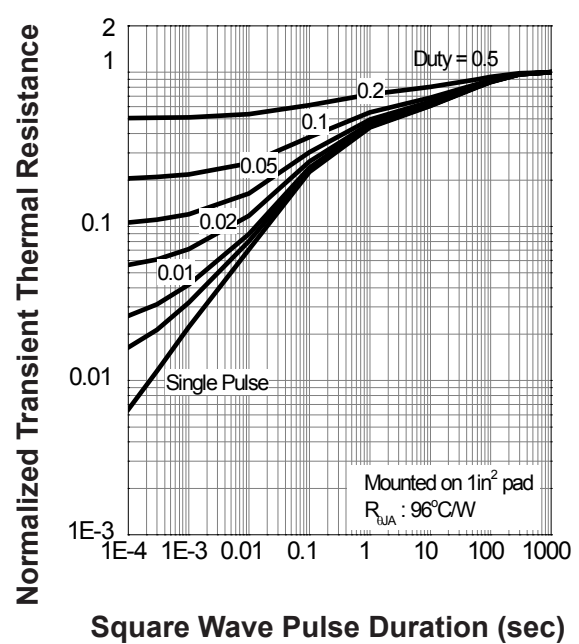
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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} =8A T _J =125°C	-	8.2 12	10.8 -	mΩ
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =8A	-	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} =8A	-	15.3	21.42	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =8A	-	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 $\leq 2\%$.

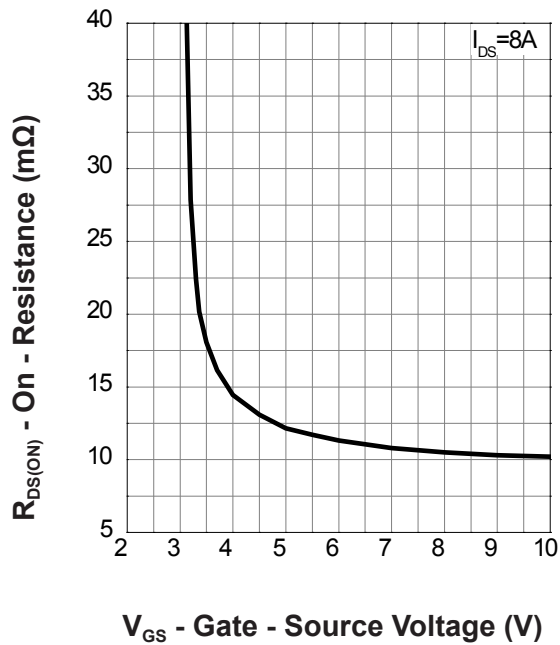
Note f : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

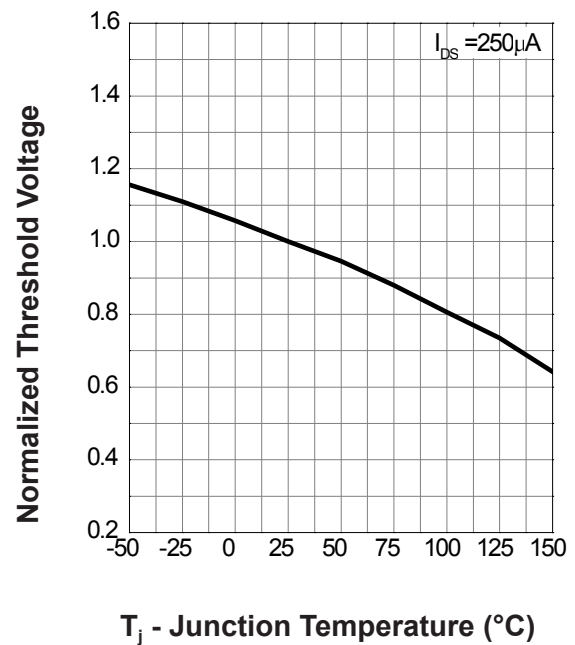
Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


Typical Operating Characteristics(Cont.)

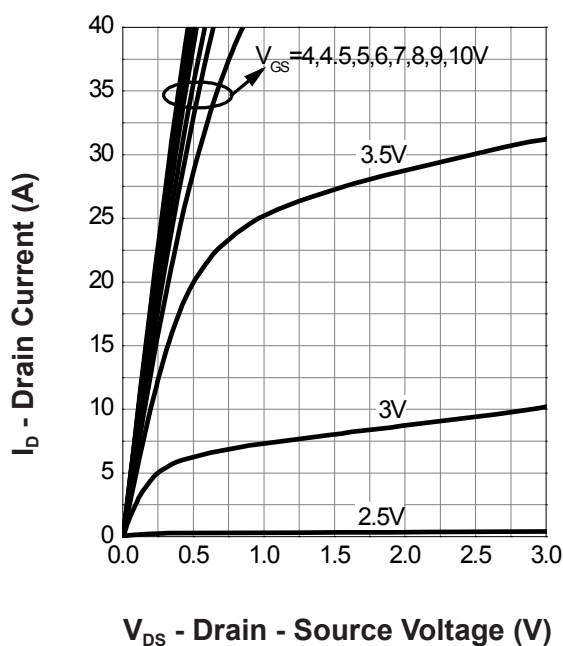
Gate-Source On Resistance



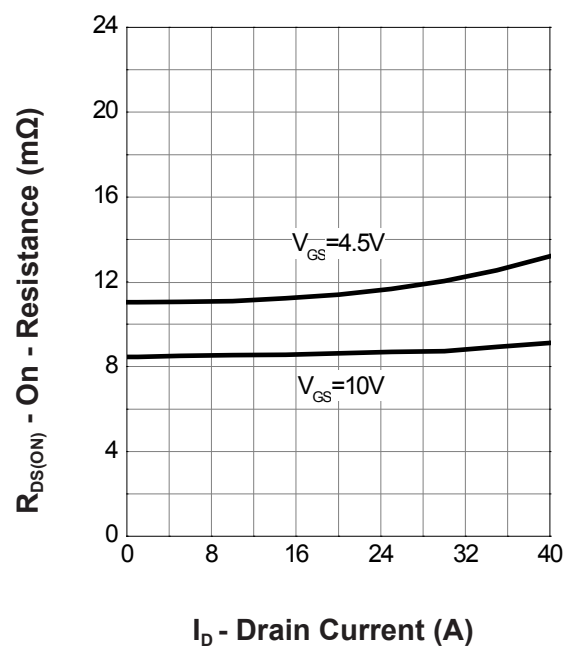
Gate Threshold Voltage



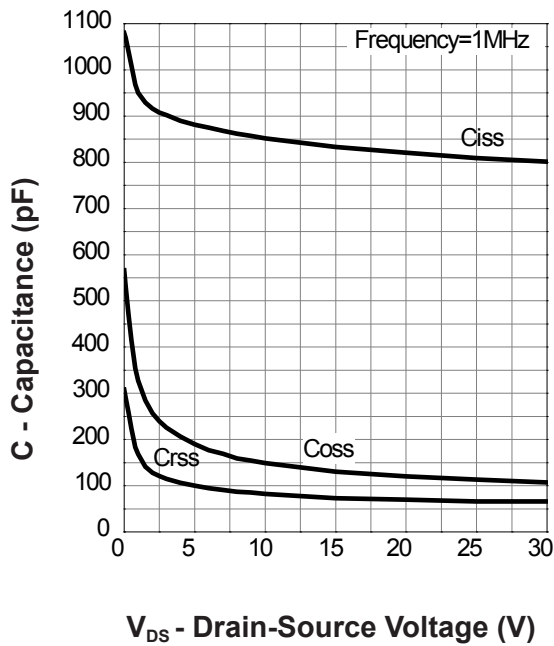
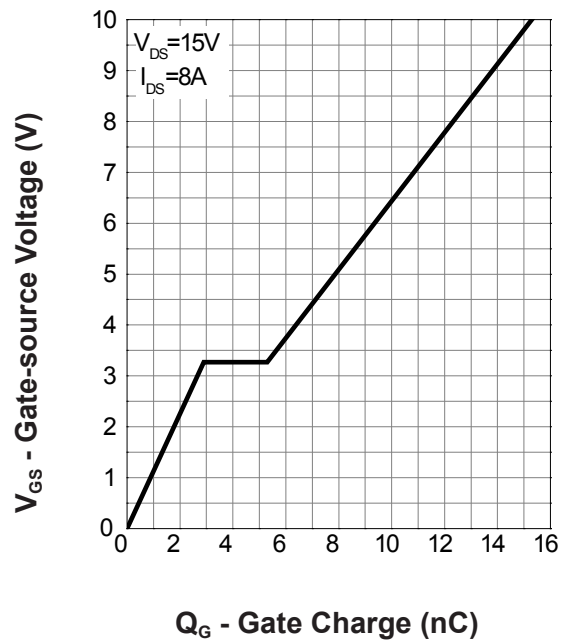
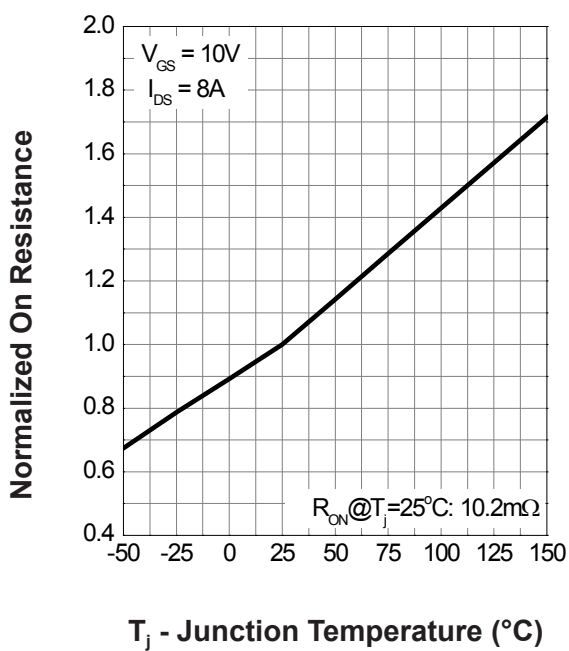
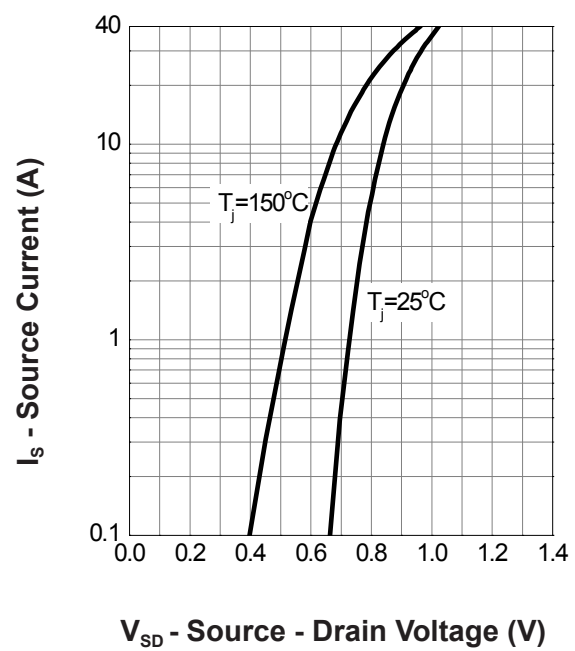
Output Characteristics



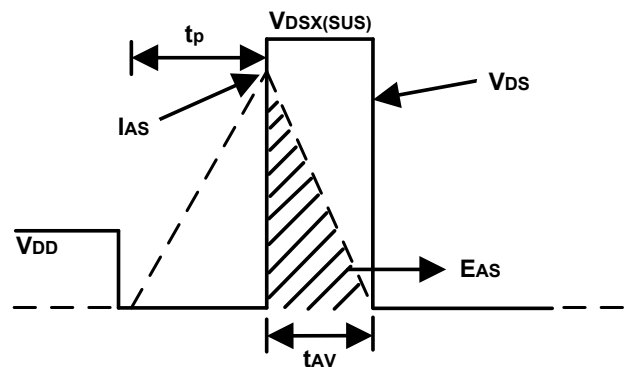
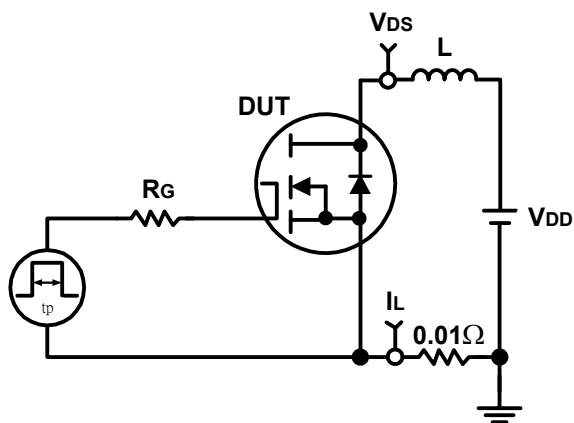
Drain-Source On Resistance



Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

