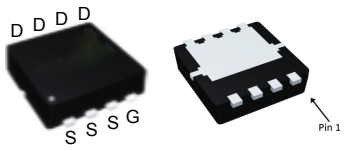
Features

- 40V/40A,
  $R_{DS(ON)}$= 6mΩ(typ.) @ V_{GS}= 10V
  $R_{DS(ON)}$= 7mΩ(typ.) @ V_{GS}= 4.5V
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
  (RoHS Compliant)

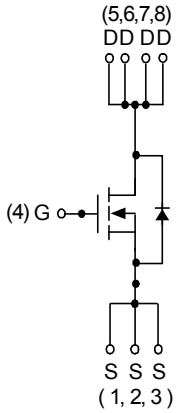
Applications

- SMPS Synchronous Rectification.
- Load Switch.
- DC-DC Conversion.

Pin Description



DFN3.3x3.3A-8_EP



N-Channel MOSFET

Absolute Maximum Ratings (T_A = 25°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		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	
I_S	Diode Continuous Forward Current	T_C=25°C	25	A
I_D [a]	Continuous Drain Current	T_C=25°C	40[a]	
		T_C=100°C	55	
I_{DM} [b]	Pulsed Drain Current	T_C=25°C	224	
P_D	Maximum Power Dissipation	T_C=25°C	54	W
		T_C=100°C	22	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	2.3	°C/W
I_D	Continuous Drain Current	T_A=25°C	17.3	A
		T_A=70°C	13.8	
I_{DM} [b]	Pulsed Drain Current	T_A=25°C	69	A
P_D	Maximum Power Dissipation	T_A=25°C	2.5	W
		T_A=70°C	1.6	
$R_{\theta JA}$ [c]	Thermal Resistance-Junction to Ambient	t ≤ 10s	17	°C/W
		Steady State	50	
I_{AS} [d]	Avalanche Current, Single pulse	L=0.1mH	32	A
E_{AS} [d]	Avalanche Energy, Single pulse	L=0.1mH	51	mJ

Note a：Max. continue 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 150°C (initial temperature T_j=25°C).

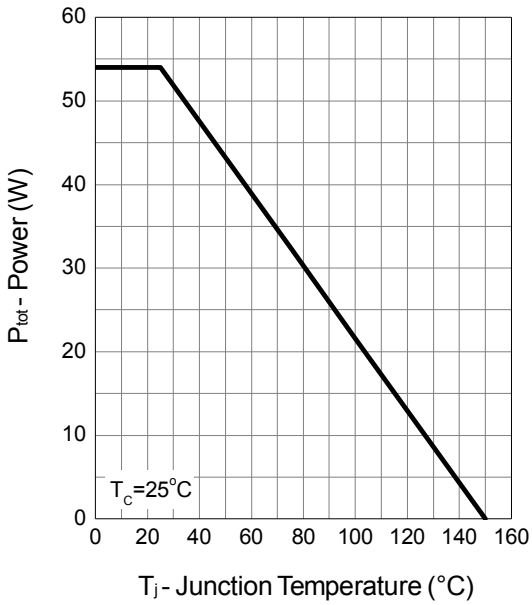
Electrical Characteristics (T_A = 25°C unless otherwise noted)

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	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	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}=40A	-	6	7.5	mΩ
		V_{GS}=4.5V, I_{DS}=35A	-	7	9	
Gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=20A	-	31	-	S
Diode Characteristics						
V_{SD} [e]	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V	-	0.75	1.1	V
t_{rr}	Reverse Recovery Time	I_{SD}=20A, dI_{SD}/dt=100A/μs	-	28	-	ns
t_a	Charge Time		-	17	-	
t_b	Discharge Time		-	12	-	
Q_{rr}	Reverse Recovery Charge		-	20	-	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	-	1645	2139	pF
C_{oss}	Output Capacitance		-	385	-	
C_{rss}	Reverse Transfer Capacitance		-	55	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V, R_L=20Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	14.3	26	ns
t_r	Turn-on Rise Time		-	7.7	14	
$t_{d(OFF)}$	Turn-off Delay Time		-	32.6	59	
t_f	Turn-off Fall Time		-	26.6	48	
Gate Charge Characteristics [f]						
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=10V, I_{DS}=20A	-	24.8	34.7	nC
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=4.5V, I_{DS}=20A	-	11.5	-	
Q_{gth}	Threshold Gate Charge		-	3	-	
Q_{gs}	Gate-Source Charge		-	5.2	-	
Q_{gd}	Gate-Drain Charge		-	2.6	-	

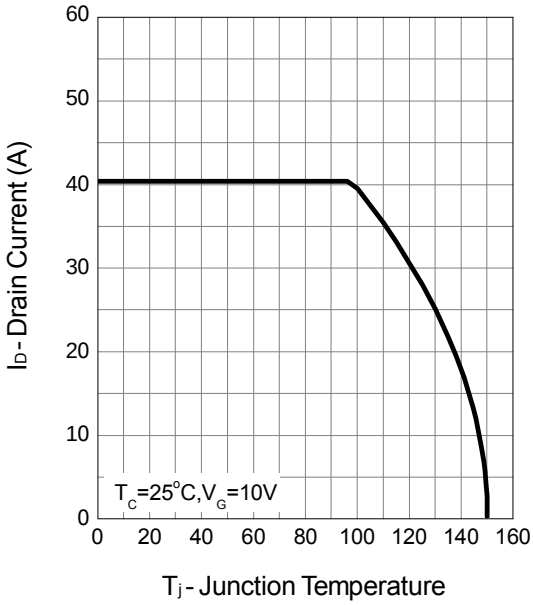
Note e：Pulse test ; pulse width≤300μs, duty cycle≤2%.
Note f：Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

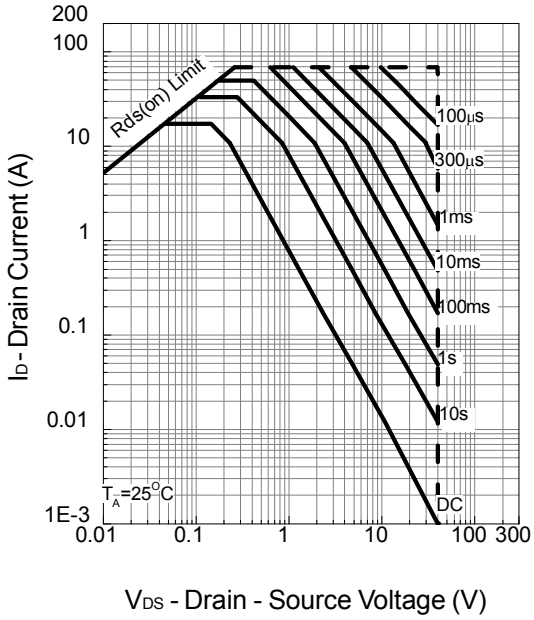
Power Dissipation



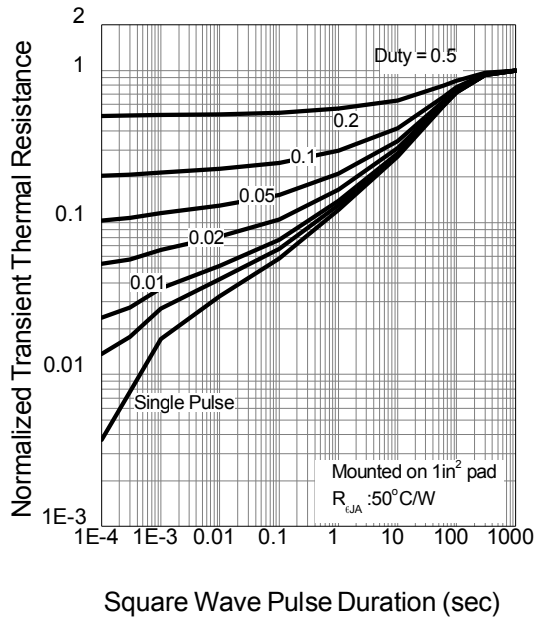
Drain Current



Safe Operation Area

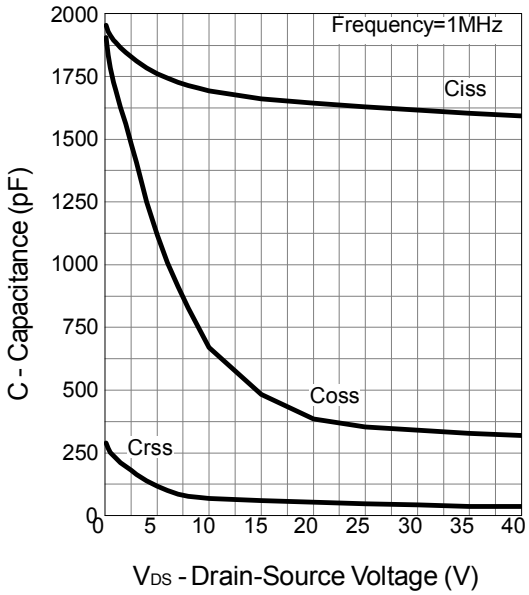


Thermal Transient Impedance

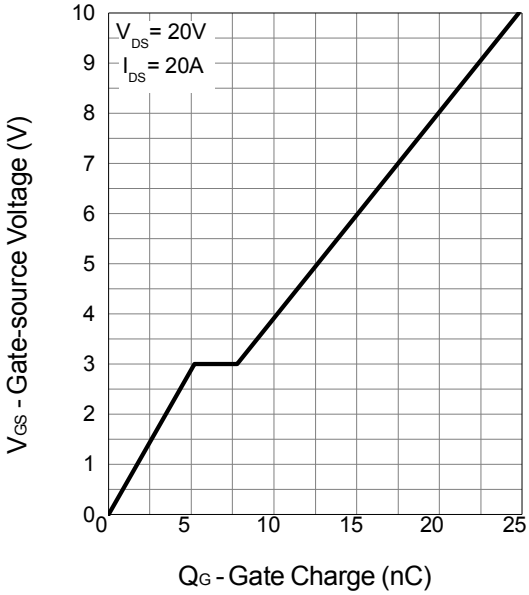


Typical Operating Characteristics (Cont.)

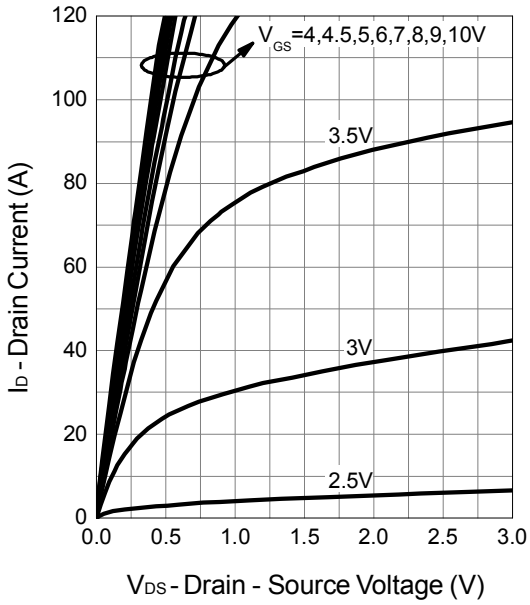
Capacitance



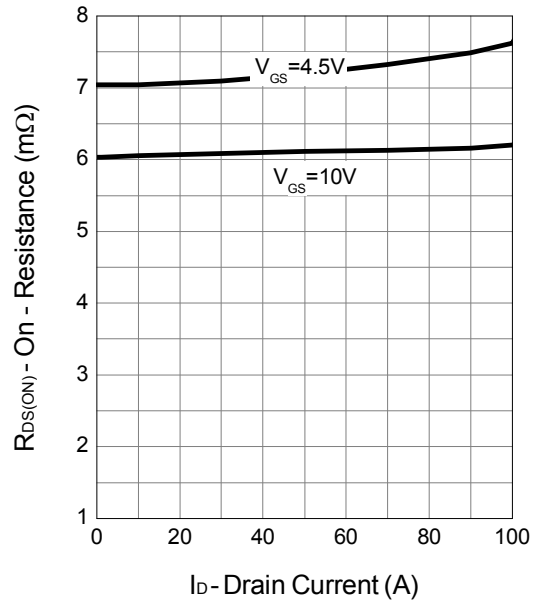
Gate Charge



Output Characteristics

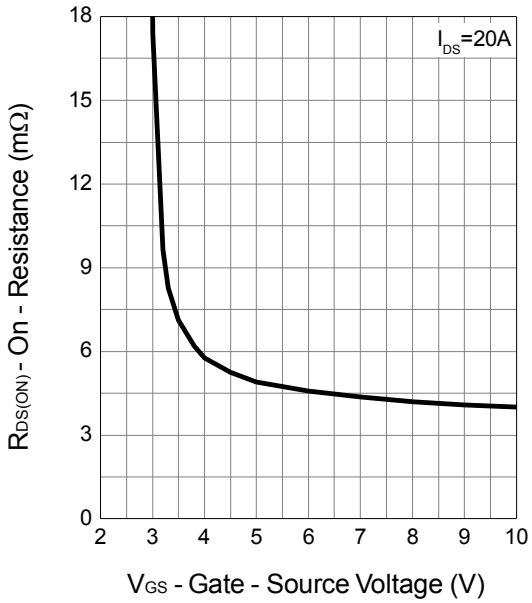


Drain-Source On Resistance

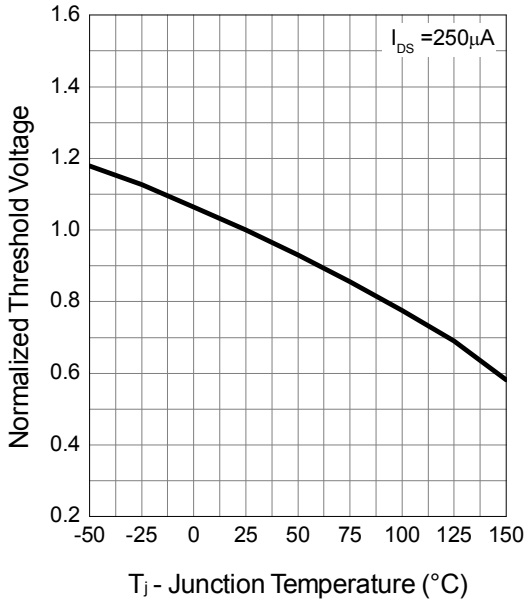


Typical Operating Characteristics (Cont.)

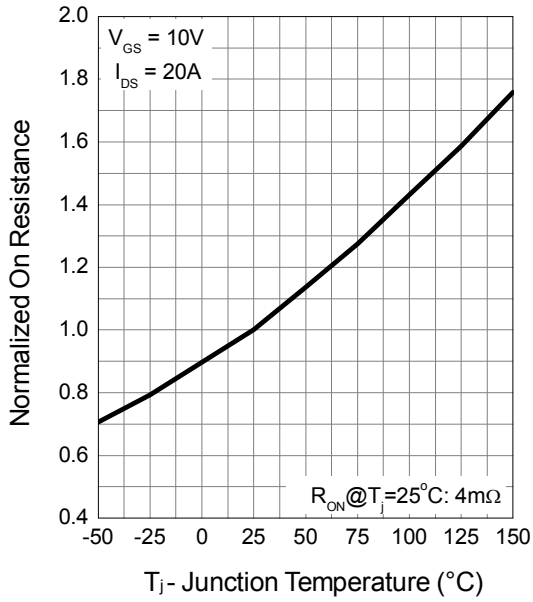
Gate-Source On Resistance



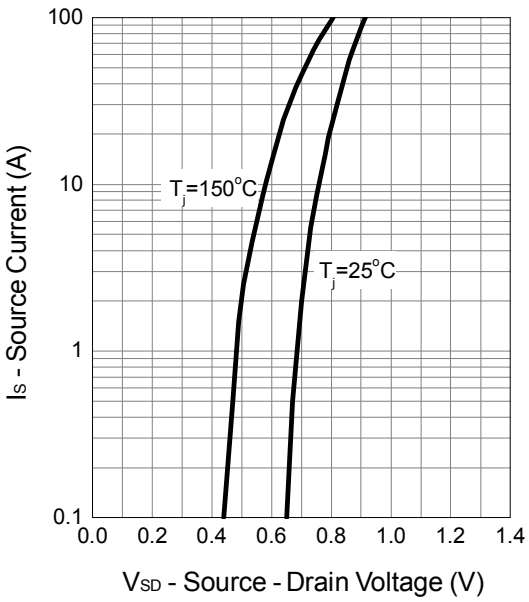
Gate Threshold Voltage



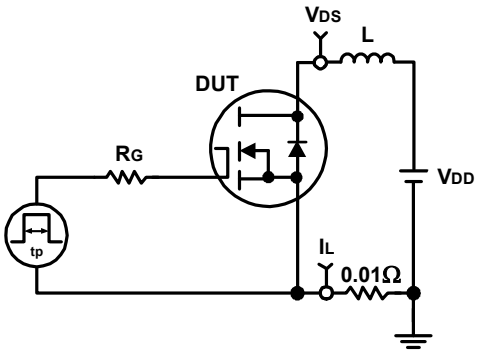
Drain-Source On Resistance

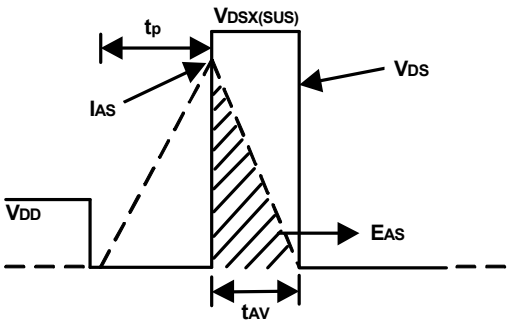


Source-Drain Diode Forward

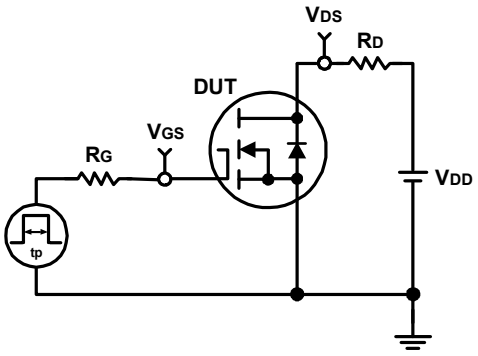


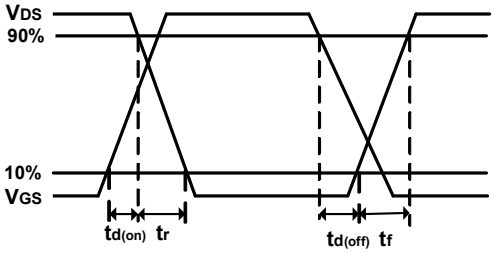
Avalanche Test Circuit and Waveforms





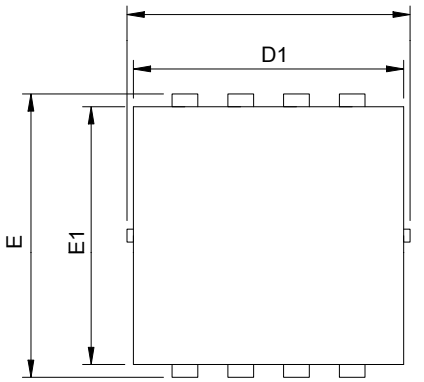
Switching Time Test Circuit and Waveforms



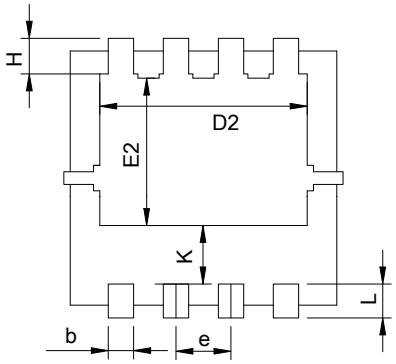


Package Information

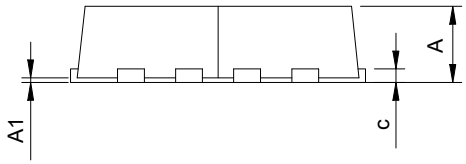
DFN3.3x3.3A-8_EP1_P



Top View



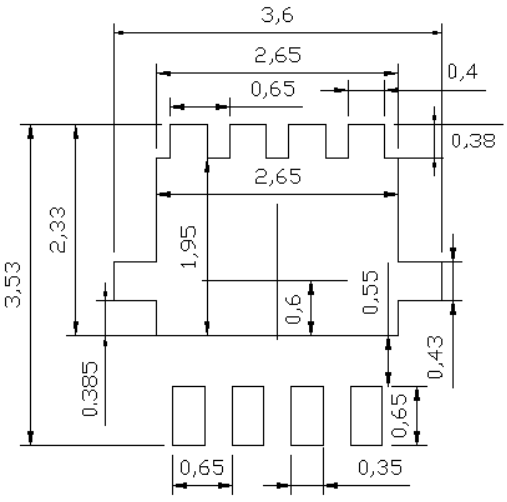
Bottom View



Side View

SYMBOL	DFN3.3x3.3A-8_EP1_P			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.10	0.25	0.004	0.010
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.59	0.093	0.102
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.98	0.065	0.078
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

RECOMMENDED LAND PATTERN



UNIT: mm