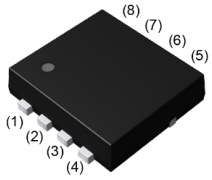
Features

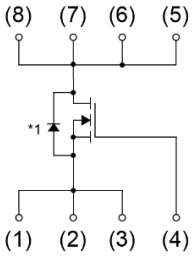
- 40V/38A,
  $R_{DS(ON)}$= 13mΩ (Max.) @ V_{GS}=10V
  $R_{DS(ON)}$= 16mΩ (Max.) @ V_{GS} =4.5V
- Reliable and Rugged
- Lead Free and Green Devices Available
  (RoHS Compliant)

Pin Description



DFN3.3X3.3_EP

(1) Source
(2) Source
(3) Source
(4) Gate
(5) Drain
(6) Drain
(7) Drain
(8) Drain
*1 Body Diode



N-Channel MOSFET

Applications

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

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_A=25°C	2	A
I_D	Continuous Drain Current	T_c=25°C	38	A
		T_c=70°C	20	
I_{DM} [a]	Pulsed Drain Current	T_A=25°C	36	
P_D	Maximum Power Dissipation	T_A=25°C	2.1	W
		T_A=70°C	1.5	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	t ≤ 10s	30	°C/W
		Steady State	60	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady State	20	
I_{AS} [b]	Avalanche Current, Single pulse	L=0.1mH	23	A
E_{AS} [b]	Avalanche Energy, Single pulse	L=0.1mH	26	mJ

Note a：Max. current is limited by bonding wire.
Note b：UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_j=25°C).

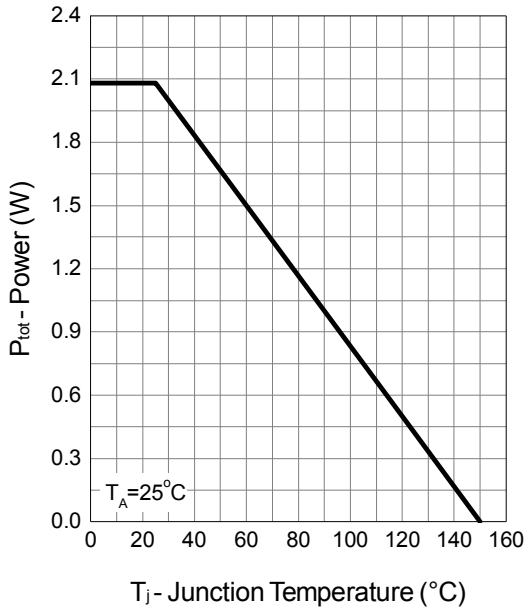
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

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	1.5	1.8	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [c]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=7A	-	10.5	13	mΩ
		T_J=125°C	-	15.75	-	
		V_{GS}=4.5V, I_{DS}=5A	-	12	16	
Gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=15A	-	31	-	S
Diode Characteristics						
V_{SD} [c]	Diode Forward Voltage	I_{SD}=10A, V_{GS}=0V	-	0.9	1.1	V
t_{rr}	Reverse Recovery Time	V_{DD}=20V, I_{SD}=10A, dI_{SD}/dt=100A/μs	-	15.2	-	ns
t_a	Charge Time		-	9.4	-	
t_b	Discharge Time		-	5.8	-	
Q_{rr}	Reverse Recovery Charge		-	9.5	-	nC
Dynamic Characteristics [d]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	0.7	1.1	1.8	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, Frequency=1.0MHz	-	1125	-	pF
C_{oss}	Output Capacitance		-	132	-	
C_{rss}	Reverse Transfer Capacitance		-	70	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V, R_L=20Ω, I_{DS}=1A, V_{GEN}=10V, R_G=1Ω	-	12.6	-	ns
t_r	Turn-on Rise Time		-	10	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	23.6	-	
t_f	Turn-off Fall Time		-	6	-	
Gate Charge Characteristics [d]						
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=4.5V, I_{DS}=7A	-	9.4	-	nC
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=10V, I_{DS}=7A	-	20	28	
Q_{gth}	Threshold Gate Charge		-	2	-	
Q_{gs}	Gate-Source Charge		-	3.9	-	
Q_{gd}	Gate-Drain Charge		-	3	-	

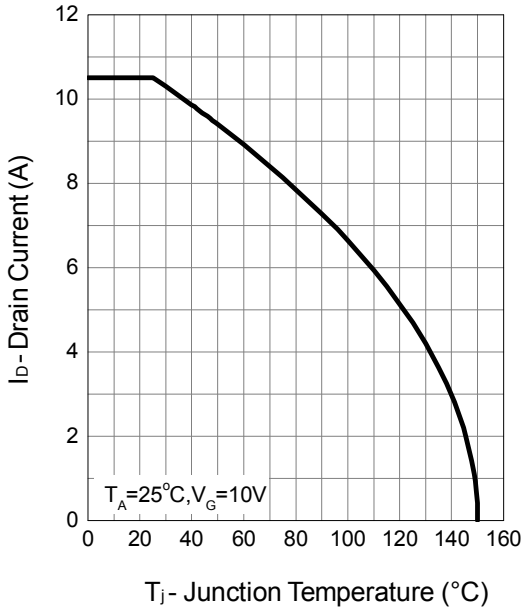
Note c：Pulse test ; pulse width≤300μs, duty cycle≤2%.

Typical Operating Characteristics

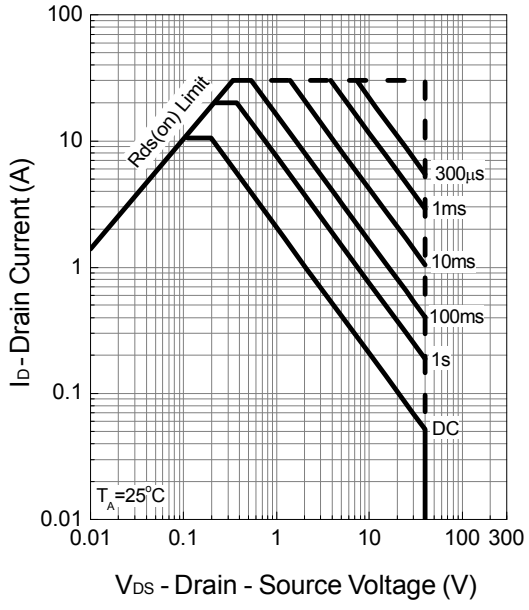
Power Dissipation



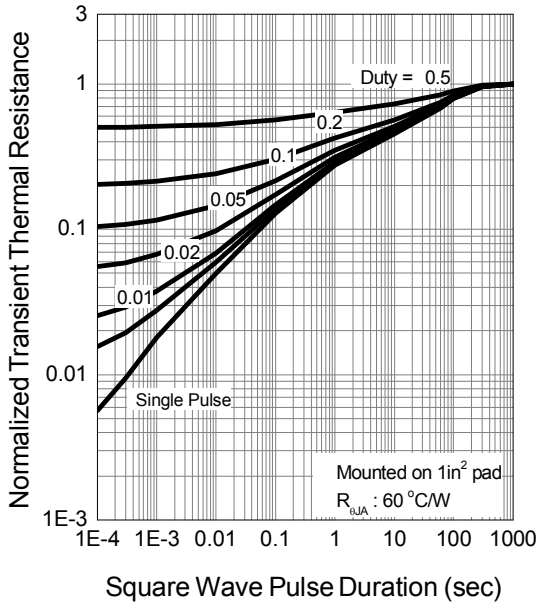
Drain Current



Safe Operation Area

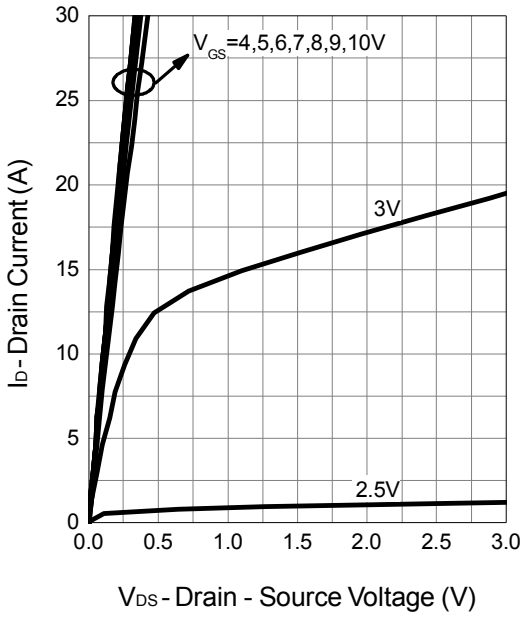


Thermal Transient Impedance

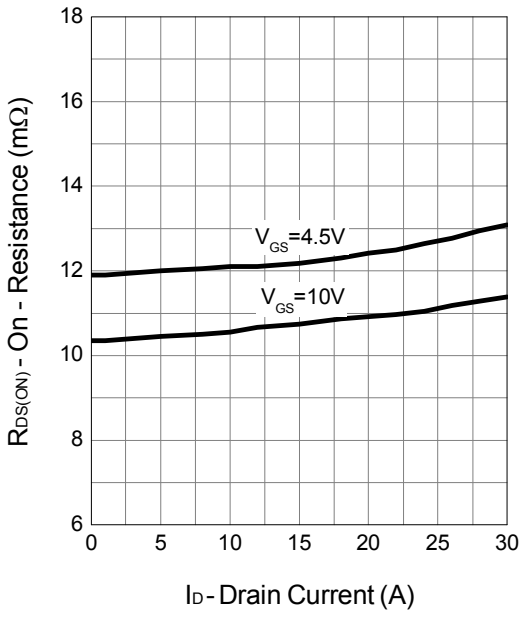


Typical Operating Characteristics (Cont.)

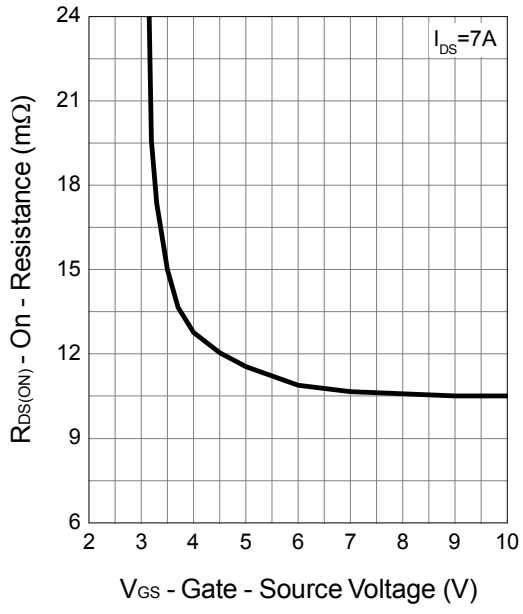
Output Characteristics



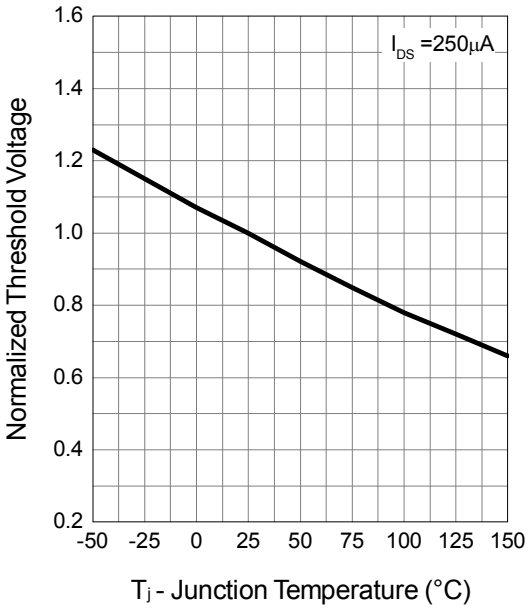
Drain-Source On Resistance



Gate-Source On Resistance

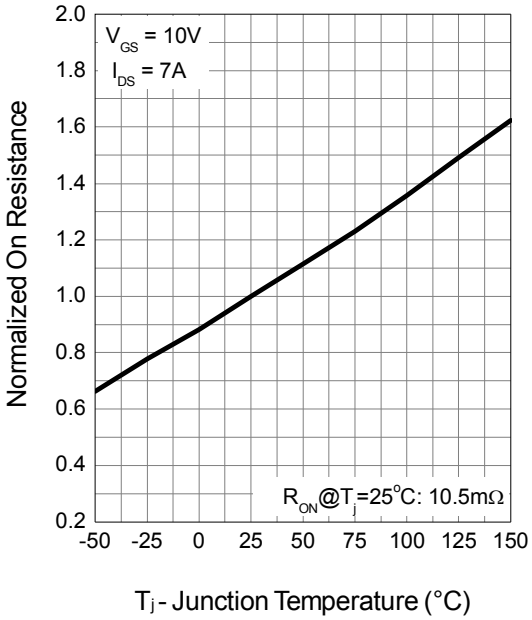


Gate Threshold Voltage

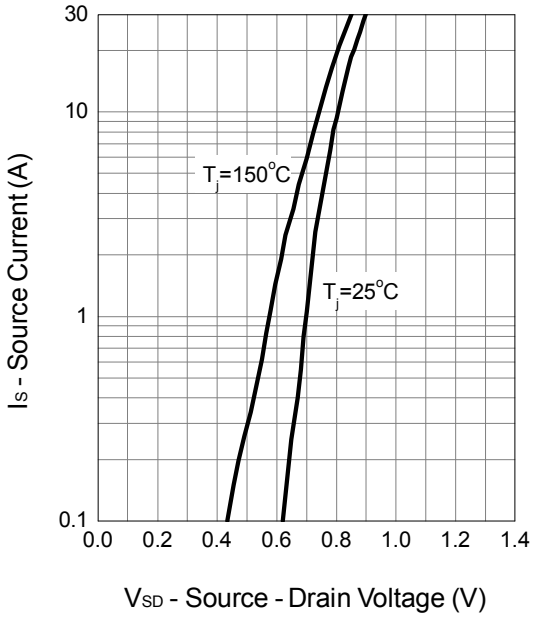


Typical Operating Characteristics (Cont.)

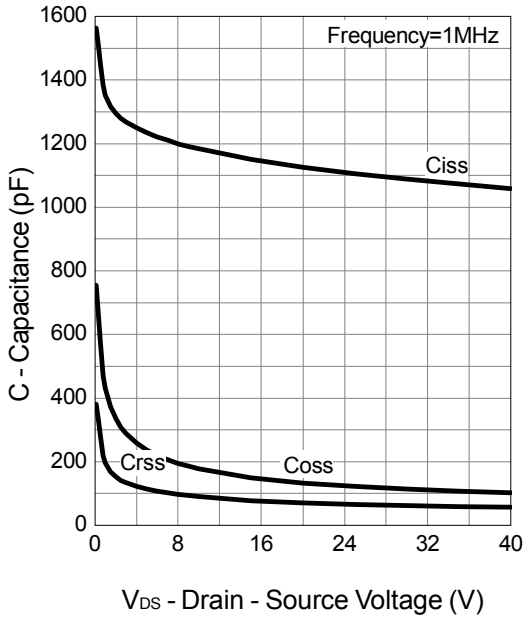
Drain-Source On Resistance



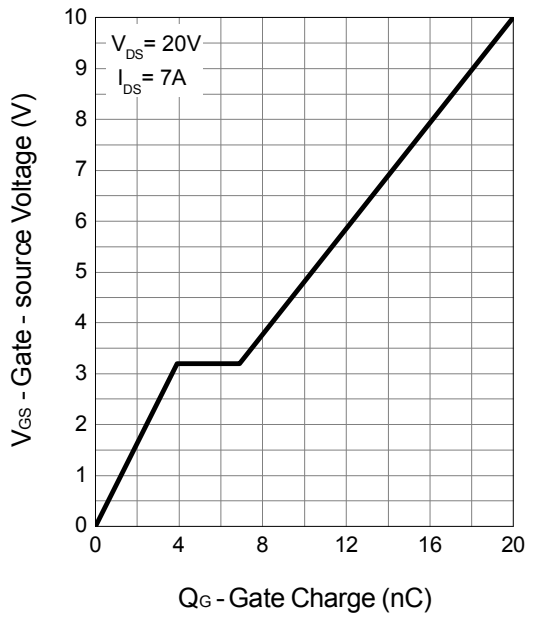
Source-Drain Diode Forward

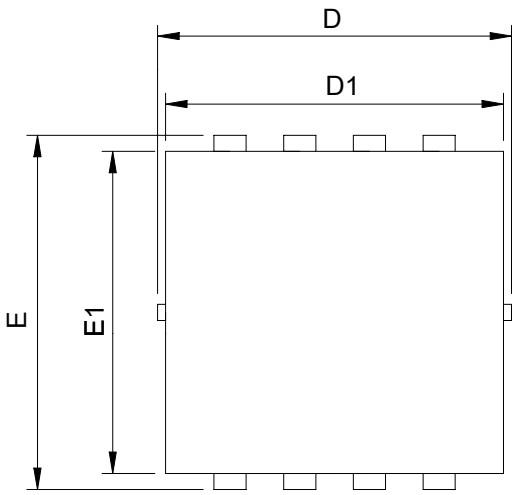


Capacitance

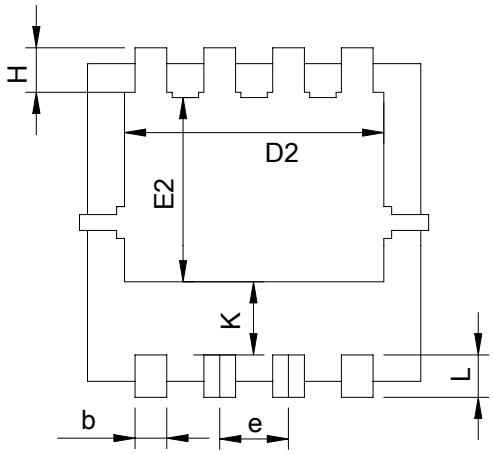


Gate Charge

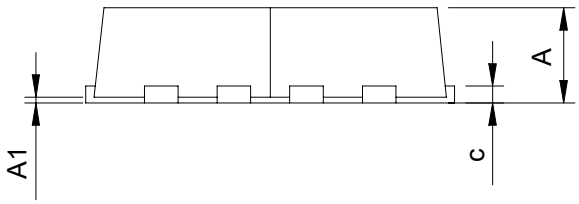




Top View

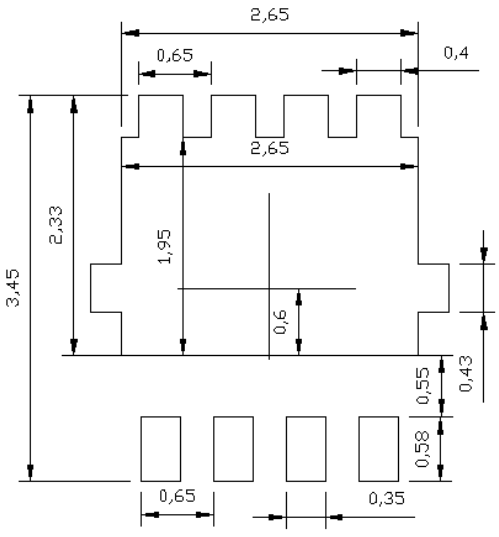


Bottom View



Side View

SYMBOL	DFN3.3x3.3_EP			
	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	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
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



UNIT: mm

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