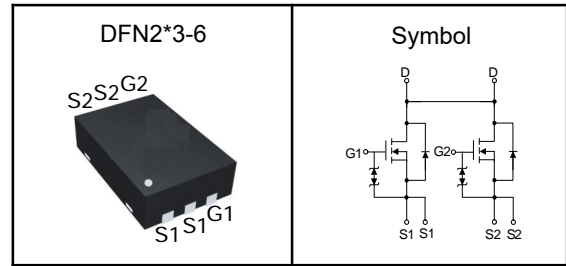# Common-Drain Dual N-Channel Enhancement Mode MOSFET

Features

● Low Rdson for low conduction loss

● ESD protection

● Reliable and Rugged

● ROHS Compliant & Halogen-Free

Applications

● Power Management in Desktop Computer

● DC/DC Converters

Pin Description

V_{DSS}	20	V
$R_{DS(ON)-Typ}$	6	mΩ
I_D	9.7	A

Absolute Maximum Ratings(T$_A$=25℃, Unless Otherwise Noted)

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		±12	V
T_J	Maximum Junction Temperature		-55 to 150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
I_S	Diode Continuous Forward Current		2	A
I_{DM}[①]	Pulse Drain Current Tested		38	A
I_D	Continuous Drain Current	T$_A$=25°C	9.7	A
P_D	Maximum Power Dissipation	T$_A$=25°C	1	W
E_{AS}[②]	Avalanche Energy, Single pulse		24.2	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{θJA}$	Thermal Resistance-Junction to Ambient	80	℃/W

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150℃.
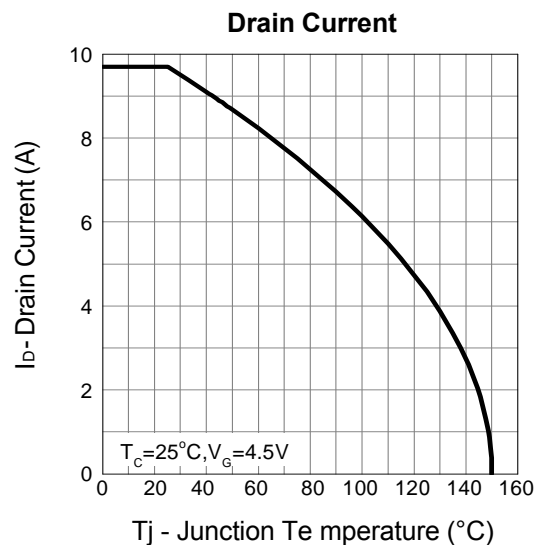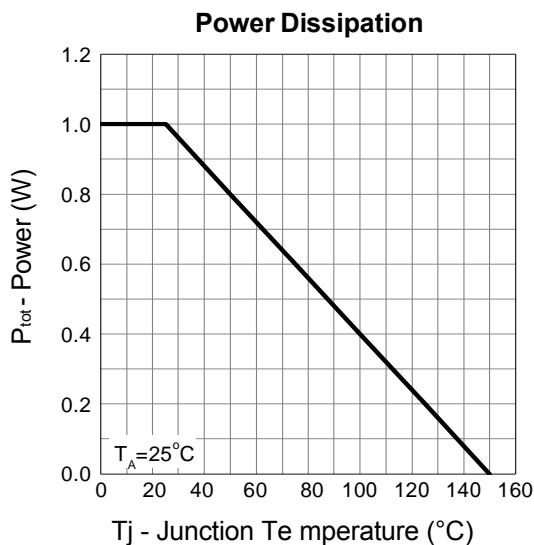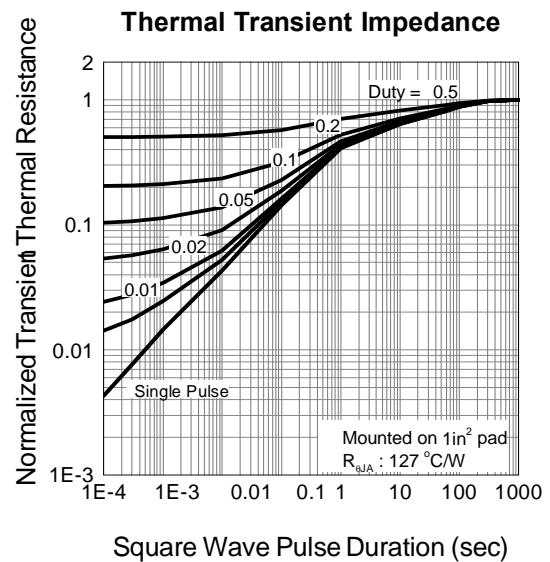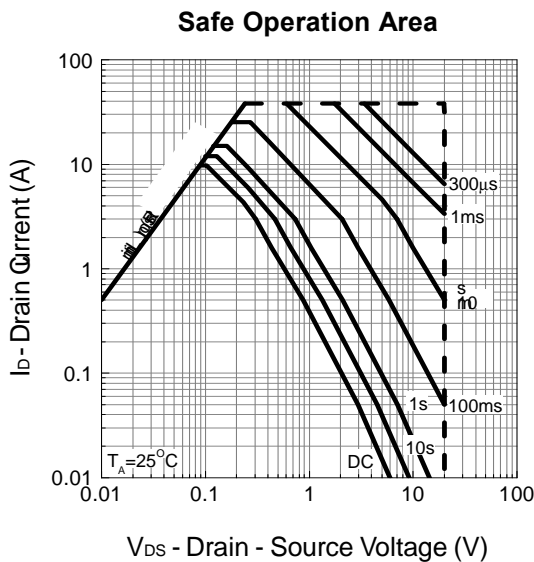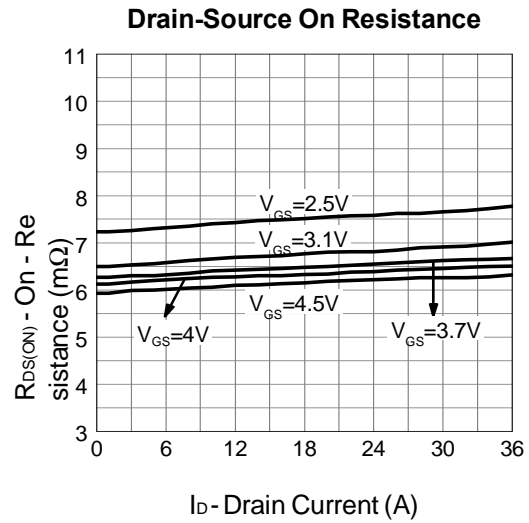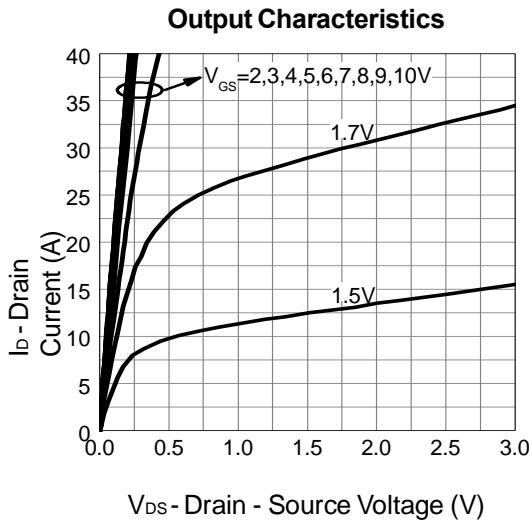
Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

Common-Drain Dual N-Channel Enhancement Mode MOSFET

Electrical Characteristics (T$_J$=25℃, Unless Otherwise Noted)

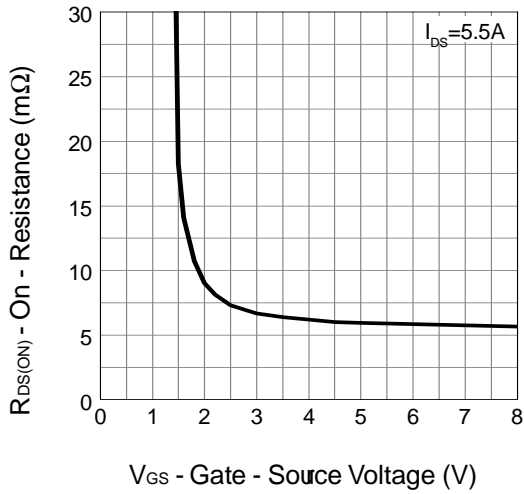| Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V, I$_D$=250uA	20	---	---	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=16V, V$_{GS}$=0V	---	---	1	uA
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250uA	0.5	---	1	V
I$_{GSS}$	Gate Leakage Current	V$_{GS}$=±12V, V$_{DS}$=0V	---	---	±10	nA
R$_{DS(ON)}$	Drain-Source On-state Resistance	V$_{GS}$=4.5V , I$_D$=5.5A	---	6	7.5	mΩ
		V$_{GS}$=2.5V , I$_D$=5.5A	---	7.3	9.9	mΩ
Dynamic Characteristics[⑤]						
C$_{iss}$	Input Capacitance	V$_{GS}$=0V, V$_{DS}$=10V, Freq.=1MHz	---	1470	---	pF
C$_{oss}$	Output Capacitance		---	258	---	
C$_{rss}$	Reverse Transfer Capacitance		---	202	---	
T$_{d(on)}$	Turn-on Delay Time	V$_{DD}$=10V, R$_L$=10Ω, I$_{DS}$=1A, V$_{GEN}$=10V, R$_G$=1Ω	---	8	---	nS
T$_r$	Turn-on Rise Time		---	20		
T$_{d(off)}$	Turn-off Delay Time		---	935	---	
T$_f$	Turn-off Fall Time		---	410	---	
R$_g$	Gate Resistance	f = 1.0MHz, open drain	---	11	---	Ω
Q$_g$	Total Gate Charge	V$_{DS}$=10V , V$_{GS}$=4.5V , I$_D$=5.5A	---	23.2	---	nC
Q$_{gs}$	Gate-Source Charge		---	1.9	---	
Q$_{gd}$	Gate-Drain Charge		---	4.8	---	
Source-Drain Characteristics （T$_J$=25℃）						
V$_{SD}$[④]	Diode Forward Voltage	I$_S$=1A, V$_{GS}$=0V	---	0.7	1.3	V
t$_{rr}$	Reverse Recovery Time	I$_{SD}$=5.5 A, di/dt=100A/μs, T$_J$=25℃	---	445	---	nS
Q$_{rr}$	Reverse Recovery Charge		---	2175	---	nC

Note ④： Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤：Guaranteed by design, not subject to production testing.

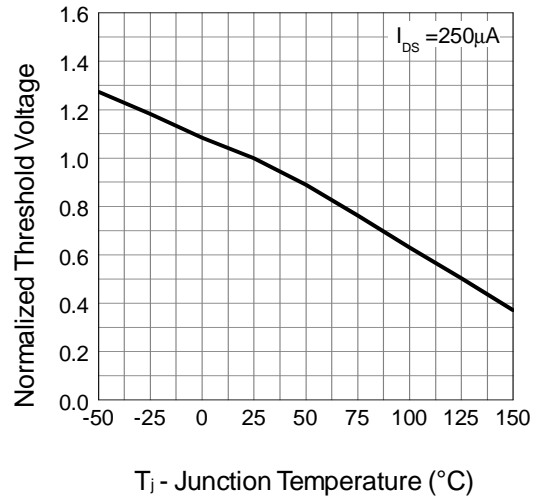# Common-Drain Dual N-Channel Enhancement Mode MOSFET

Typical Characteristics

Output Characteristics

V_{GS}=2,3,4,5,6,7,8,9,10V

1.7V

1.5V

I_D - Drain Current (A)

V_{DS} - Drain - Source Voltage (V)

Drain-Source On Resistance

V_{GS}=2.5V

V_{GS}=3.1V

V_{GS}=4.5V

V_{GS}=4V

V_{GS}=3.7V

$R_{DS(ON)}$ - On - Resistance (mΩ)

I_D - Drain Current (A)

Safe Operation Area

300μs
1ms

s
m0

1s   100ms
10s
DC

T_A=25°C

I_D - Drain Current (A)

V_{DS} - Drain - Source Voltage (V)

Thermal Transient Impedance

Duty = 0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse

Mounted on 1in^2 pad
$R_{θJA}$: 127 ^{o}C/W

Normalized Transient Thermal Resistance

Square Wave Pulse Duration (sec)

Power Dissipation

T_A=25°C

P_{tot} - Power (W)

Tj - Junction Temperature (°C)

Drain Current

T_C=25°C,V_G=4.5V

I_D - Drain Current (A)

Tj - Junction Temperature (°C)

Common-Drain Dual N-Channel Enhancement Mode MOSFET

Gate-Source On Resistance

I_{DS}=5.5A

$R_{DS(ON)}$ - On - Resistance (mΩ)

V_{GS} - Gate - Source Voltage (V)

Gate Threshold Voltage

I_{DS} =250μA

Normalized Threshold Voltage

T_j - Junction Temperature (°C)

Drain-Source On Resistance

V_{GS} = 4.5V
I_{DS} = 5.5A

Normalized On Resistance

R_{ON} @ T_j=25°C: 6mΩ

T_j - Junction Temperature (°C)
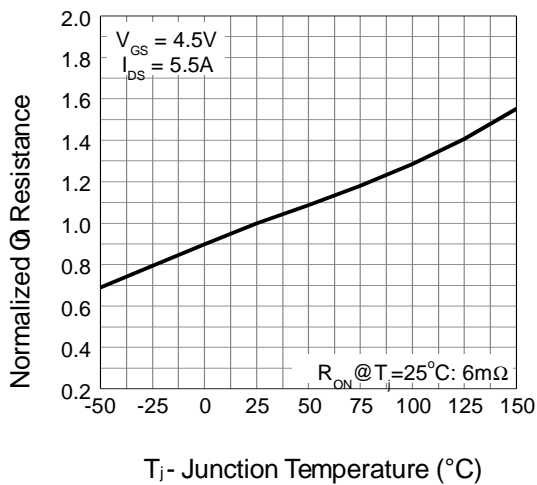
Source-Drain Diode Forward

I_S - Source Current (A)

T_j=150°C

T_j=25°C

V_{SD} - Source - Drain Voltage (V)

Capacitance

Frequency=1MHz

C - Capacitance (pF)

Ciss

Coss

Crss

V_{DS} - Drain-Source Voltage (V)

Gate Charge

V_{DS} =10V
I_{DS} =5.5A

V_{GS} - Gate-source Voltage (V)
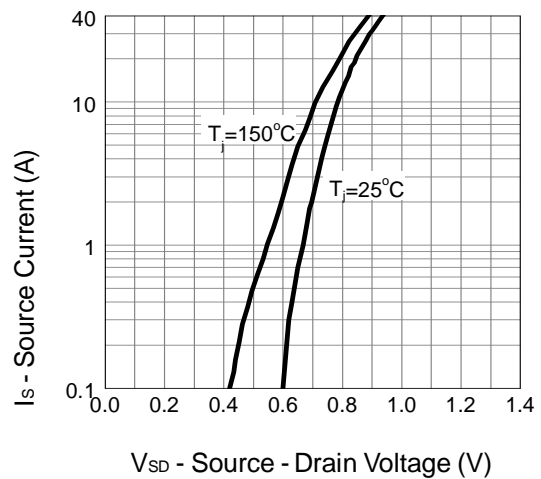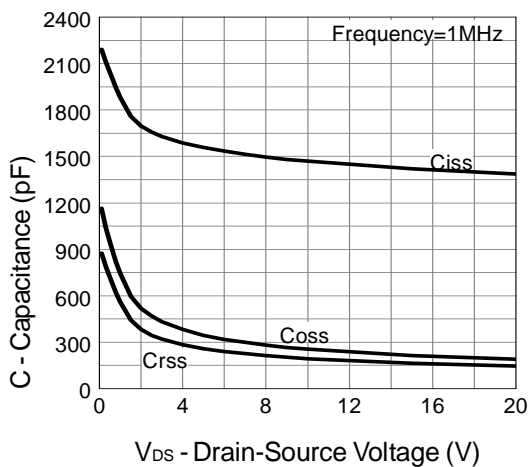
Q_G - Gate Charge (nC)
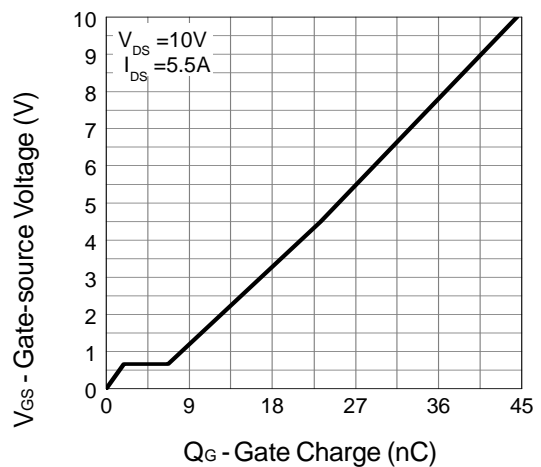
Common-Drain Dual N-Channel Enhancement Mode MOSFET

DFN2*3-6 Package Outline Dimensions

TOP VIEW

BOTTOM VIEW

SIDE VIEW
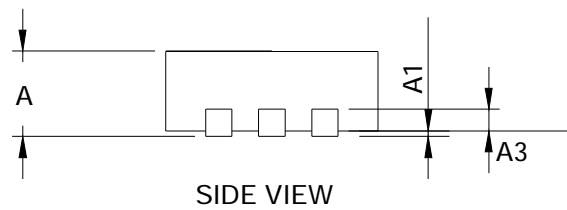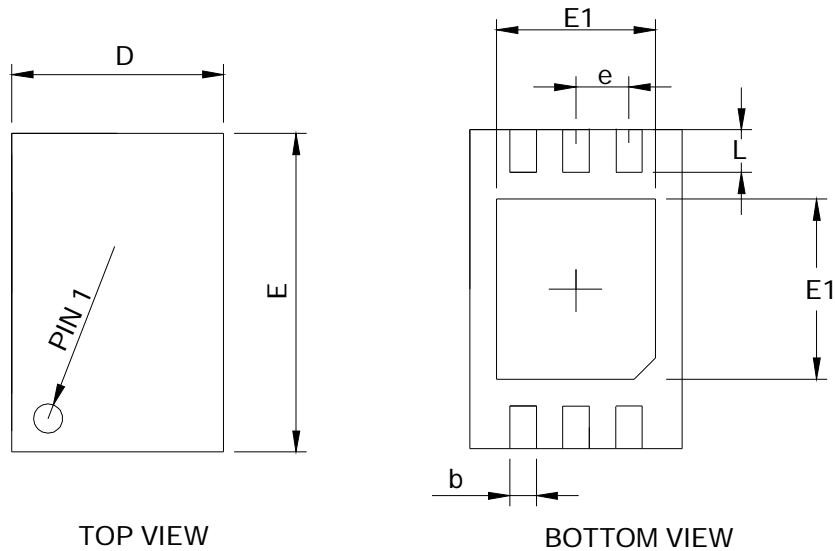
SYMBOL	DFN2*3-6			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
A3	0.203 REF		0.008 REF	
b	0.20	0.30	0.008	0.012
D	1.90	2.10	0.075	0.083
E1	1.60	1.80	0.063	0.071
E	2.90	3.10	0.114	0.122
D1	1.40	1.60	0.055	0.063
e	0.50 BSC		0.02 BSC	
L	0.30	0.50	0.012	0.020

RECOMMENDED LAND PATTERN

UNIT: mm