

20V Common-Drain Dual N-Channel MOSFET

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Green Device Available
- ESD Protected 2KV Embedded

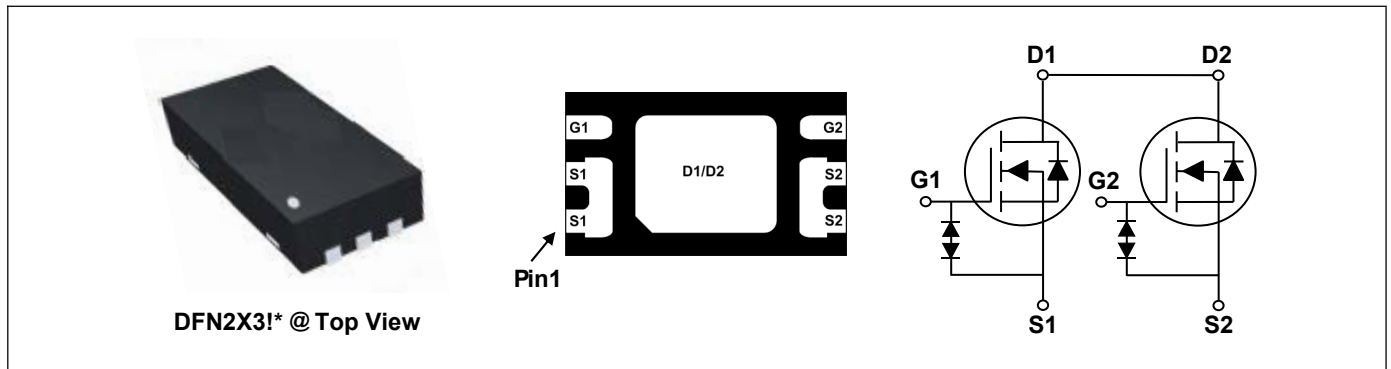
Product Summary



V_{DS}	20	V
I_D	9.5	A
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	9	m Ω
$R_{DS(ON)}$ (at $V_{GS}=2.5V$)	13.5	m Ω

Applications

- Handheld Instruments
- Battery Switch



Absolute Maximum Ratings($T_A=25^\circ C$, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ¹	$I_D@T_A=25^\circ C$	9.5	A
Continuous Drain Current ¹	$I_D@T_A=70^\circ C$	7.6	A
Pulsed Drain Current ²	I_{DM}	60	A
Total Power Dissipation ¹	$P_D@T_A=25^\circ C$	1.56	W
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient ¹ ($t \leq 10s$)	$R_{\theta JA}$	---	80	$^\circ C/W$

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Electrical Characteristics (T_J=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	20	---	---	V
Static Drain-Source On-Resistance ²	R _{DS(ON)}	V _{GS} =4.5V, I _D =5A	---	---	9	mΩ
		V _{GS} =4.0V, I _D =5A	---	---	9.5	mΩ
		V _{GS} =3.7V, I _D =5A	---	---	10	mΩ
		V _{GS} =3.1V, I _D =5A	---	---	11.2	mΩ
		V _{GS} =2.5V, I _D =5A	---	---	13.5	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	0.45	---	1.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =16V, V _{GS} =0V, T _J =55°C	---	---	5	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	---	---	±10	uA
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =5.5A	---	38	---	S
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =4.5V, I _D =5.5A	---	22	---	nC
Gate-Source Charge	Q _{gs}		---	3.1	---	
Gate-Drain Charge	Q _{gd}		---	8.2	---	
Turn-On Delay Time	T _{d(on)}	V _{DD} =15V, V _{GS} =4.5V, R _G =6Ω, I _D =5.5A	---	10	---	ns
Rise Time	T _r		---	39.5	---	
Turn-Off Delay Time	T _{d(off)}		---	65	---	
Fall Time	T _f		---	30	---	
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHz	---	1647	---	pF
Output Capacitance	C _{oss}		---	170	---	
Reverse Transfer Capacitance	C _{rss}		---	148	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ¹	I _S	V _G =V _D =0V, Force Current	---	---	9.5	A
Pulsed Source Current ²	I _{SM}		---	---	60	A
Diode Forward Voltage ²	V _{SD}	V _{GS} =0V, I _S =9.5A, T _J =25°C	---	---	1.2	V

Note:

- The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, t ≤ 10s.
- The data tested by pulsed, pulse width ≤ 10us, duty cycle ≤ 1%

Typical Characteristics

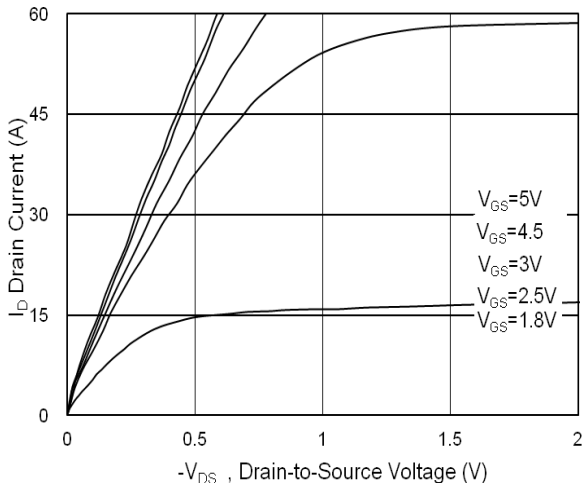


Fig.1 Typical Output Characteristics

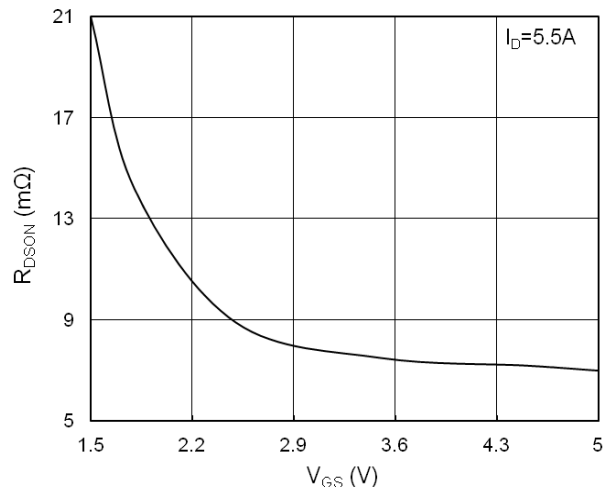


Fig.2 On-Resistance vs. Gate-Source

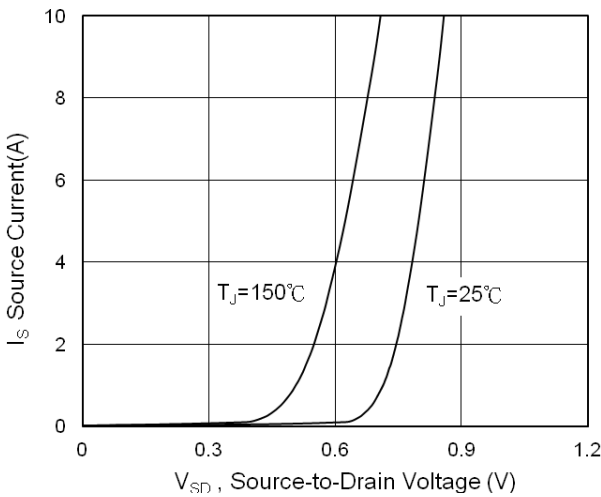


Fig.3 Forward Characteristics Of Reverse

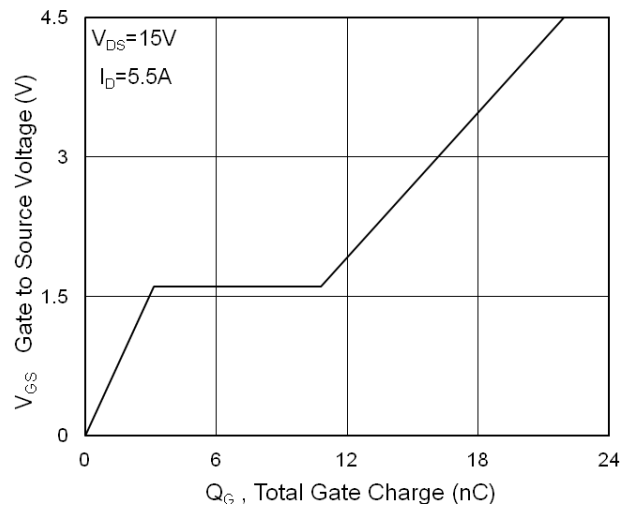


Fig.4 Gate-Charge Characteristics

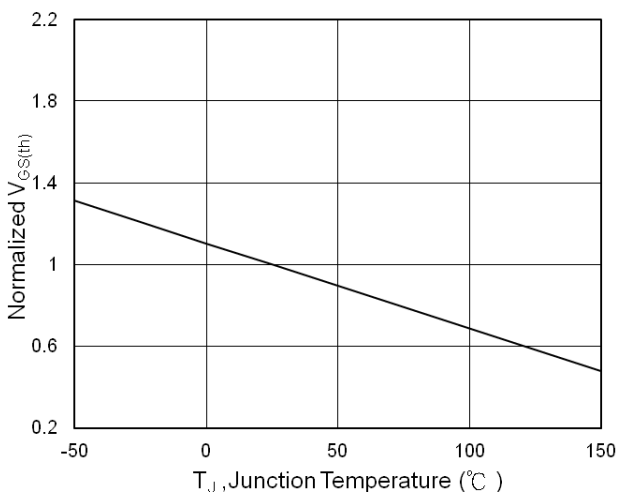


Fig.5 $V_{GS(th)}$ vs. T_J

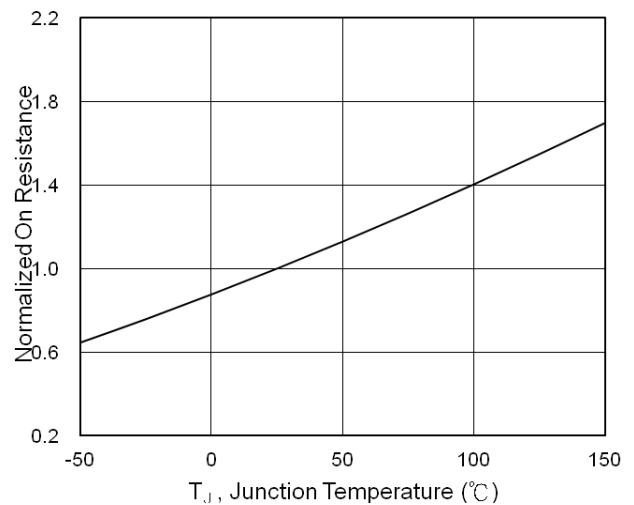


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

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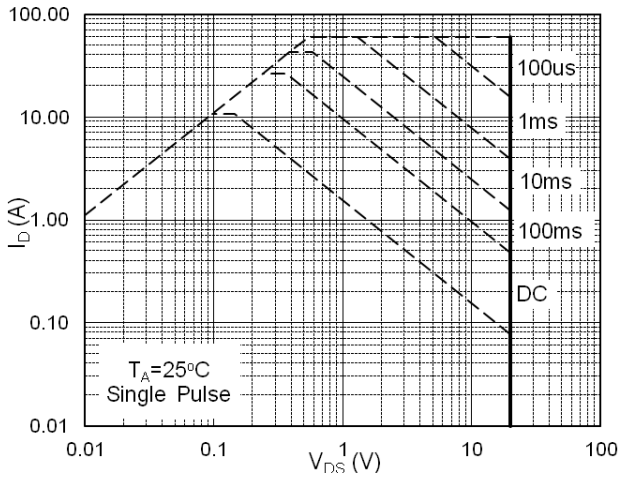


Fig.7 Capacitance

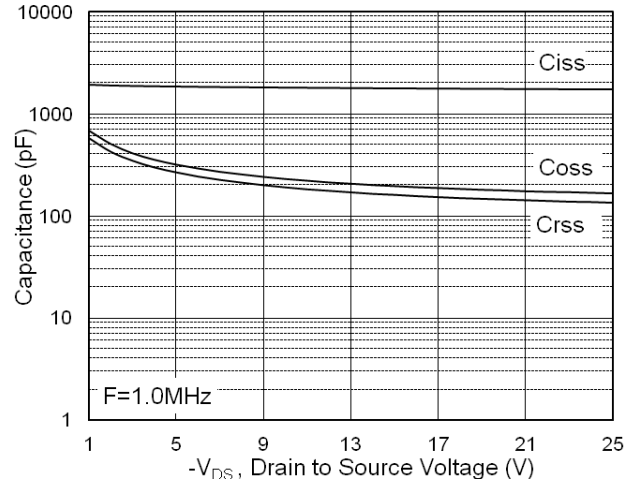


Fig.8 Safe Operating Area

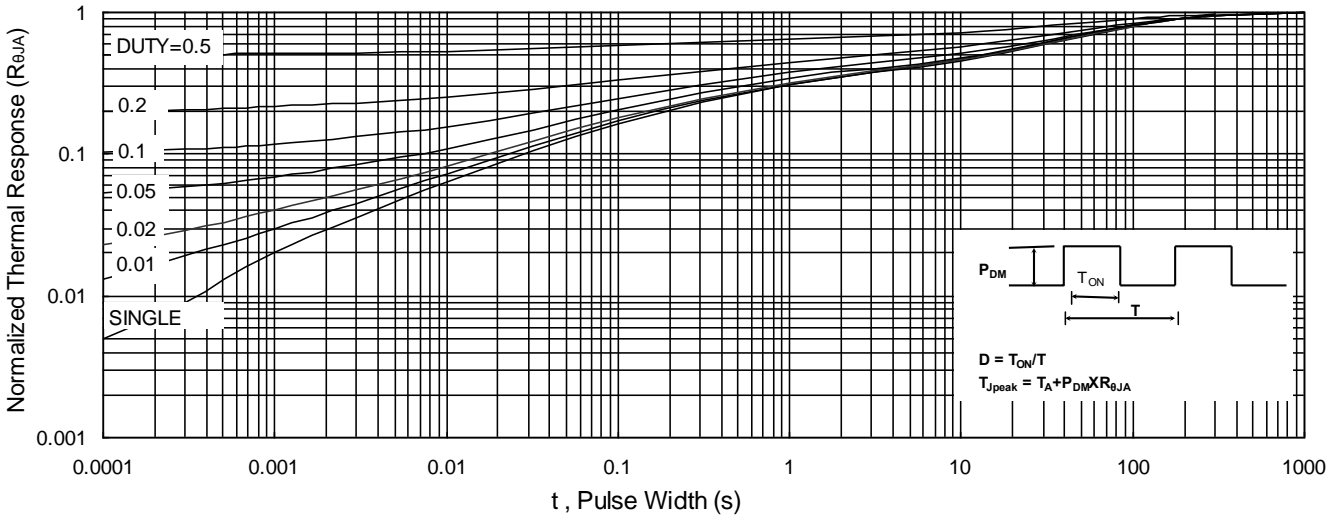


Fig.9 Normalized Maximum Transient Thermal Impedance

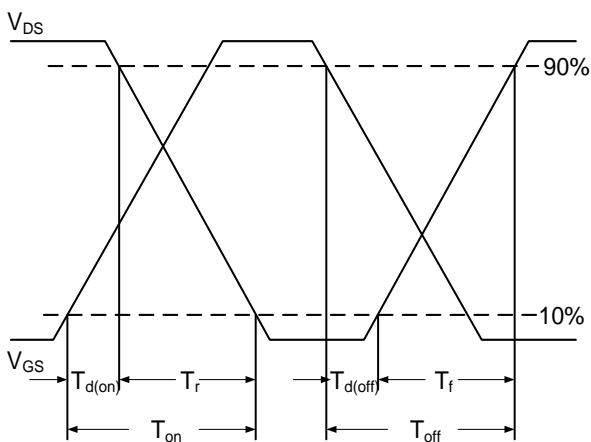


Fig.10 Switching Time Waveform

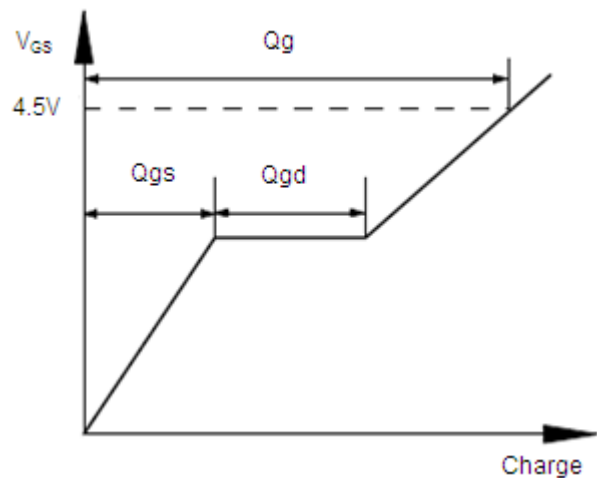
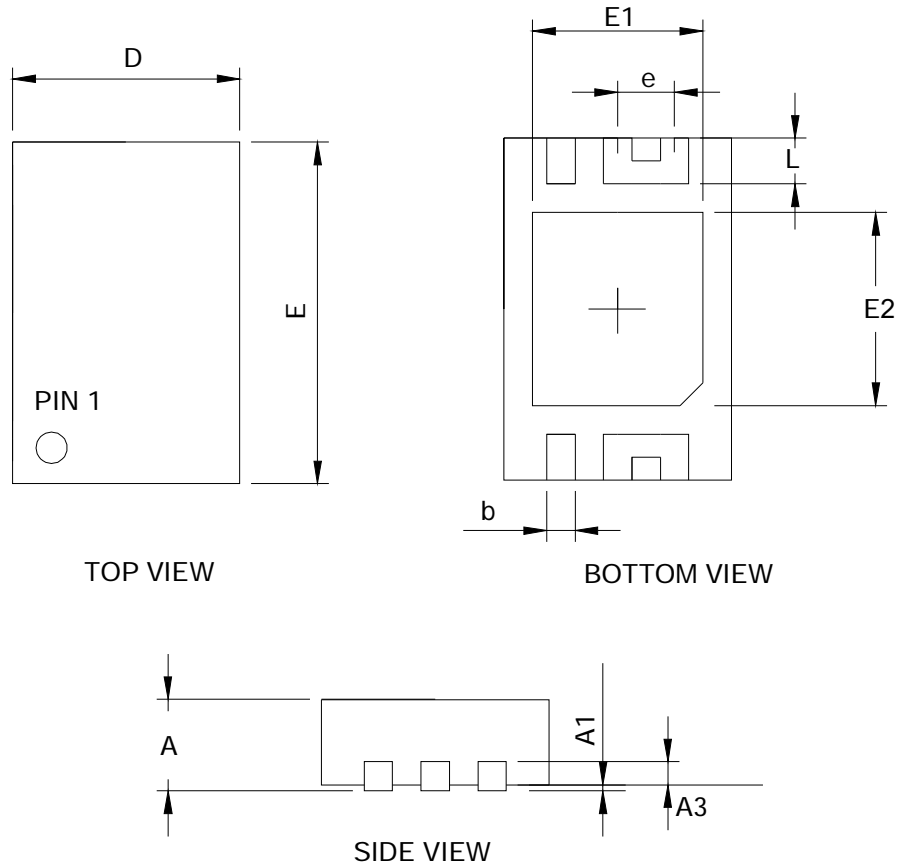


Fig.11 Gate Charge Waveform

DFN2X3-6L Package Outline Dimensions



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.70	0.80	0.85	A1	0.00	--	0.05
A3	0.195	0.200	0.211	D	1.95	2.00	2.05
E	2.95	3.00	3.05	E1	1.45	1.50	1.55
E2	1.65	1.70	1.75	b	0.20	0.25	0.30
L	0.35	0.40	0.45	e	0.50BSC		