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

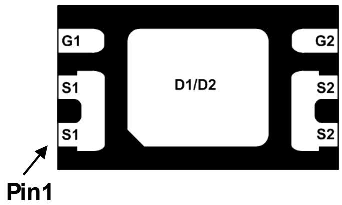
Product Summary

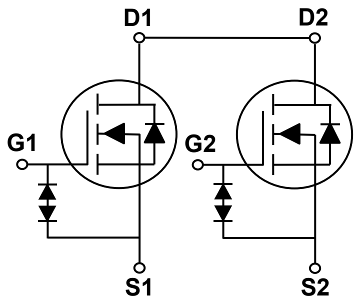
V_{DS}	20	V
I_D	8	A
$R_{DS(ON)}$ (at V_{GS}=4.5V)	16	mΩ
$R_{DS(ON)}$ (at V_{GS}=2.5V)	27.5	mΩ

Applications

- Handheld Instruments
- Battery Switch

DFN2X3-6L Top View





Absolute Maximum Ratings(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current, VGS @ 4.5V[1]	I_D@T_A=25℃	8	A
Continuous Drain Current, VGS @ 4.5V[1]	I_D@T_A=70℃	6.4	A
Pulsed Drain Current[2]	I_{DM}	50	A
Total Power Dissipation[1]	P_D@T_A=25℃	1.56	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient[1](t ≤10s)	$R_{\theta JA}$	---	80	℃/W

Electrical Characteristics (T_J=25℃, 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=2A	---	13	16	mΩ
		V_{GS}=4.0V , I_D=2A	---	13.5	17	mΩ
		V_{GS}=3.7V , I_D=2A	---	14	18	mΩ
		V_{GS}=3.1V , I_D=2A	---	16	21	mΩ
		V_{GS}=2.5V , I_D=2A	---	20.5	27.5	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	0.5	---	1.2	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=16V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=16V , V_{GS}=0V , T_J=55℃	---	---	5	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±8V , V_{DS}=0V	---	---	±10	uA
Forward Transconductance	gfs	V_{DS}=10V , I_D=4A	---	42	---	S
Total Gate Charge	Q_g	V_{DS}=15V ,V_{GS}=4.5V , I_D=3A	---	10.6	---	nC
Gate-Source Charge	Q_{gs}		---	2.2	---	
Gate-Drain Charge	Q_{gd}		---	4.1	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=15V , V_{GS}=4.5V , R_G=6Ω, I_D=3A	---	7	---	ns
Rise Time	T_r		---	36	---	
Turn-Off Delay Time	$T_{d(off)}$		---	46.5	---	
Fall Time	T_f		---	15	---	
Input Capacitance	C_{iss}	V_{DS}=10V , V_{GS}=0V , f=1MHz	---	735	---	pF
Output Capacitance	C_{oss}		---	83	---	
Reverse Transfer Capacitance	C_{rss}		---	81	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1]	I_S	V_G=V_D=0V , Force Current	---	---	8	A
Pulsed Source Current[2]	I_{SM}		---	---	50	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=8A , T_J=25℃	---	---	1.2	V

Note:

1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, t ≤10s.

2.The data tested by pulsed , pulse width ≦ 10us , duty cycle ≦ 1%

Typical Characteristics

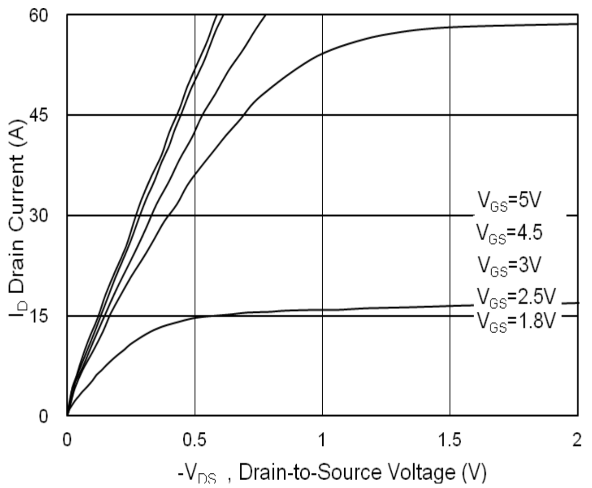


Fig.1 Typical Output Characteristics

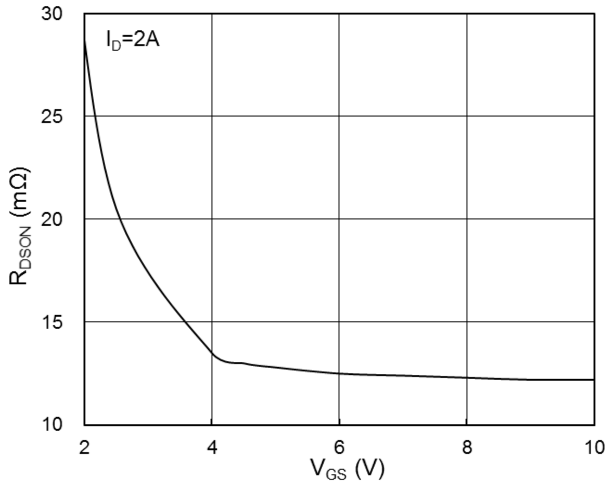


Fig.2 On-Resistance vs. G-S Voltage

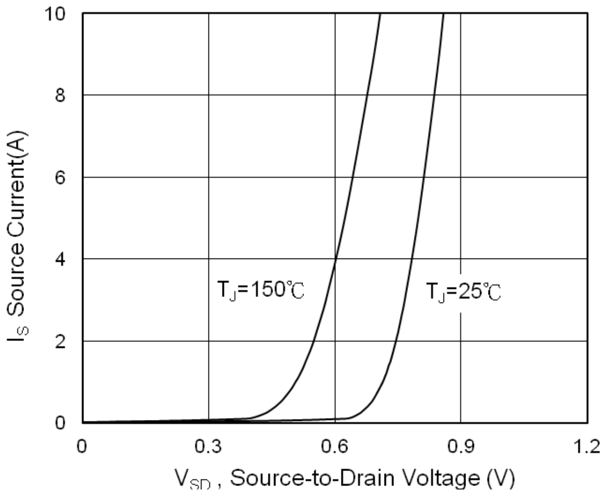


Fig.3 Forward Characteristics of Reverse

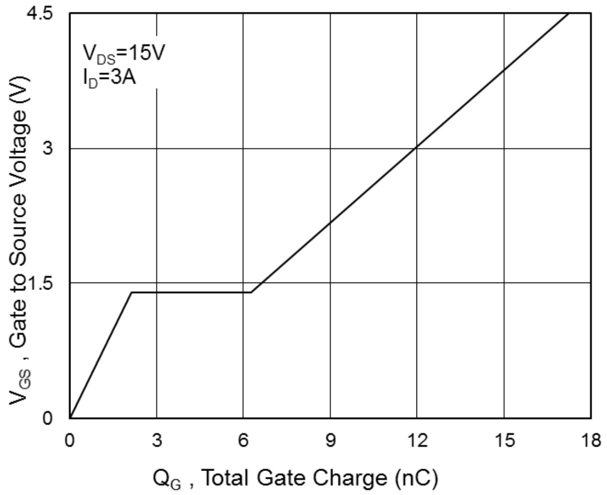


Fig.4 Gate-Charge Characteristics

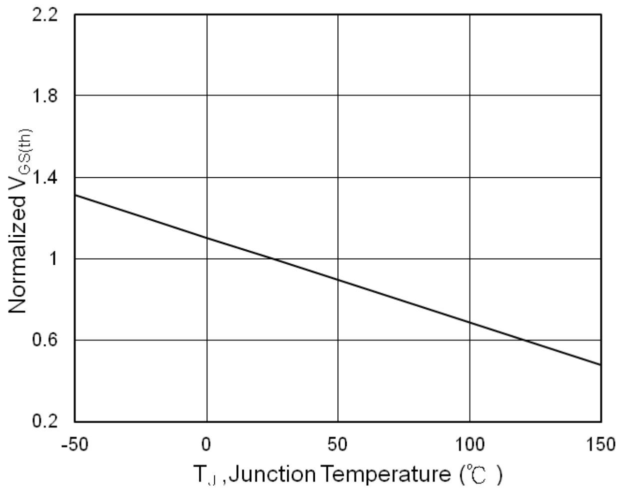


Fig.5 $V_{GS(th)}$ vs. T_J

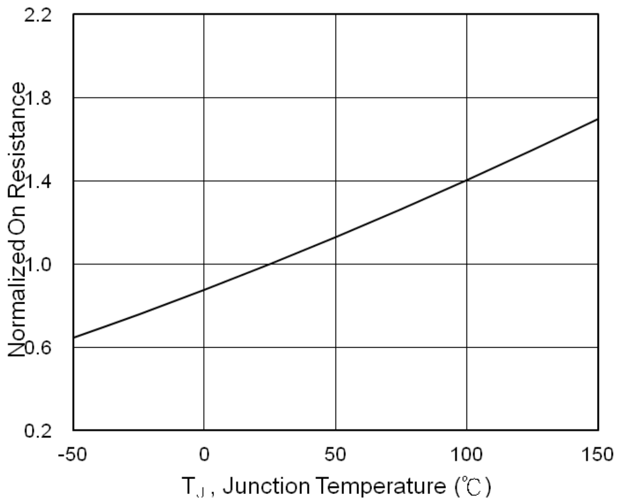


Fig.6 Normalized R_{DSON} vs. T_J

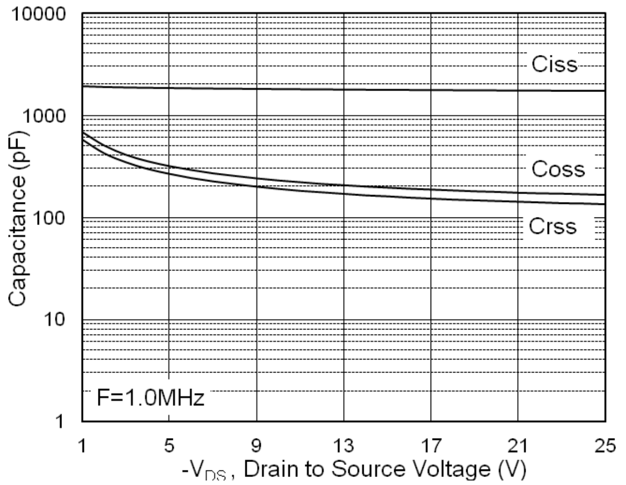


Fig.7 Capacitance

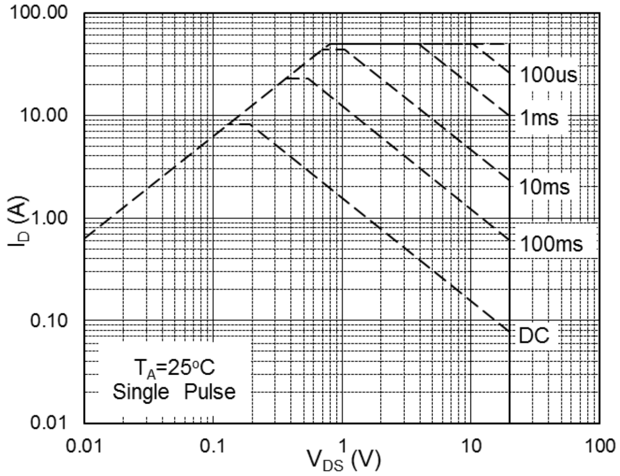


Fig.8 Safe Operating Area

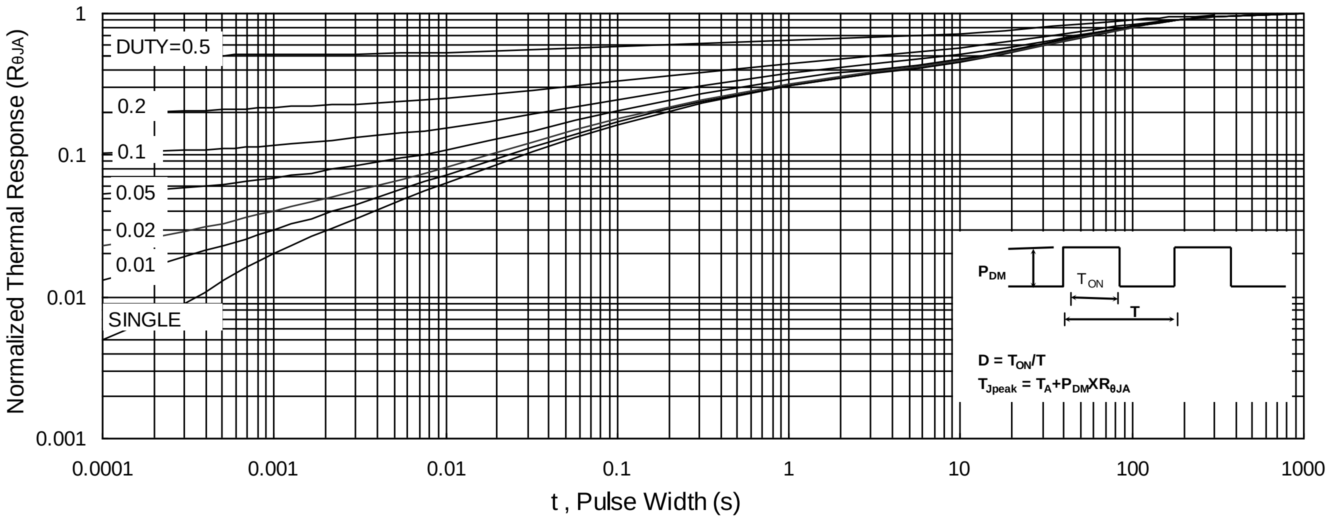


Fig.9 Normalized Maximum Transient Thermal Impedance

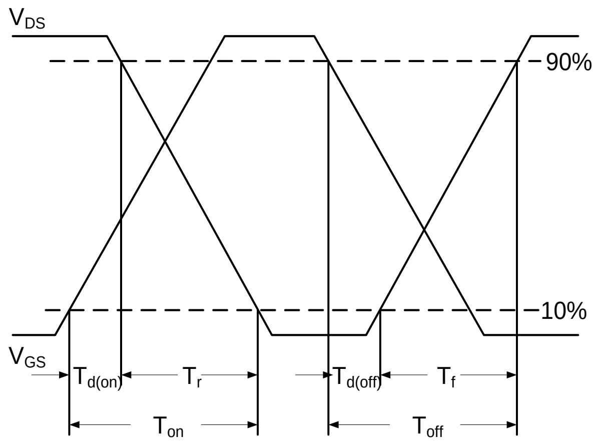


Fig.10 Switching Time Waveform

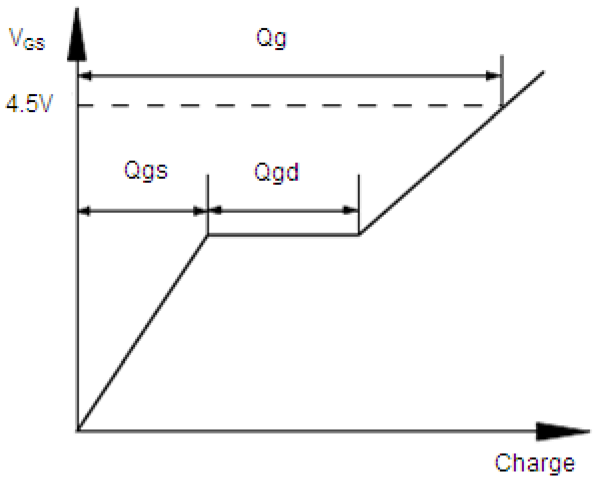
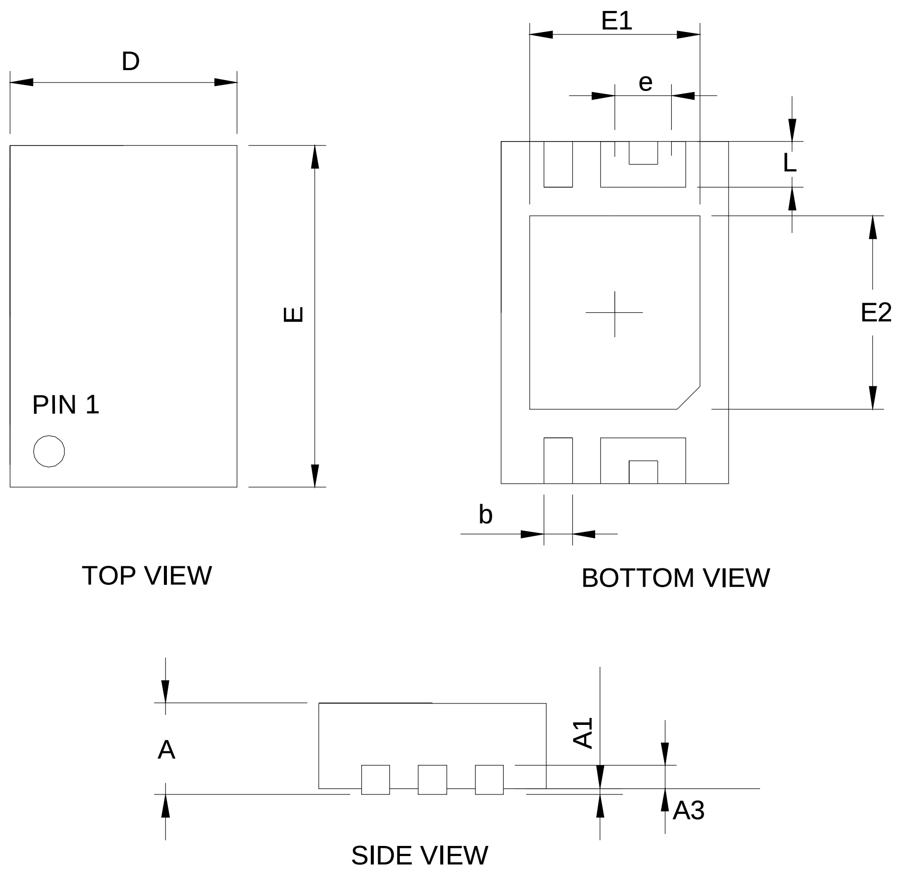


Fig.11 Gate Charge Waveform

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		