

20V Common-Drain Dual N-Channel MOSFET

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- ESD Protected 2KV Embedded
- Green Device Available

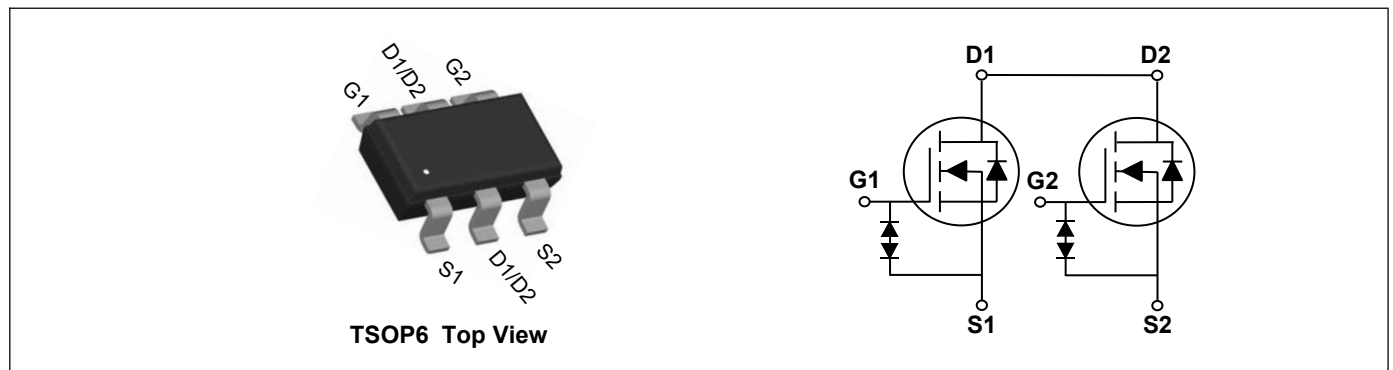
Product Summary



V_{DS}	20	V
I_D	6	A
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	20	m Ω
$R_{DS(ON)}$ (at $V_{GS}=2.5V$)	26	m Ω

Applications

- High Frequency Point-of-Load, Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load 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	$I_D@T_A=25^{\circ}C$	6	A
Continuous Drain Current ¹	$I_D@T_A=70^{\circ}C$	4.8	A
Pulsed Drain Current ²	I_{DM}	25	A
Total Power Dissipation ³	$P_D@T_A=25^{\circ}C$	1.25	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	$R_{\theta JA}$	---	100	$^{\circ}C/W$

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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 =3A	---	16.5	20	mΩ
		V _{GS} =4.0V, I _D =3A	---	17	20.5	mΩ
		V _{GS} =3.7V, I _D =3A	---	17.5	21	mΩ
		V _{GS} =3.1V, I _D =3A	---	18.5	23	mΩ
		V _{GS} =2.5V, I _D =3A	---	21	26	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°C	---	---	1	uA
		V _{DS} =16V, V _{GS} =0V, T _J =55°C	---	---	5	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±8V, V _{DS} =0V	---	---	±100	nA
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =3A	---	17	---	S
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =4.5V, I _D =6A	---	10.4	---	nC
Gate-Source Charge	Q _{gs}		---	1.3	---	
Gate-Drain Charge	Q _{gd}		---	2.6	---	
Turn-On Delay Time	T _{d(on)}	V _{DD} =10V, V _{GS} =4.5V, R _G =3.3Ω, I _D =3A	---	3.2	---	ns
Rise Time	T _r		---	9.8	---	
Turn-Off Delay Time	T _{d(off)}		---	31	---	
Fall Time	T _f		---	3.6	---	
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	630	---	pF
Output Capacitance	C _{oss}		---	66	---	
Reverse Transfer Capacitance	C _{rss}		---	63	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ^{1,4}	I _S	V _G =V _D =0V, Force Current	---	---	5.5	A
Diode Forward Voltage ²	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C	---	0.78	1.2	V

Note:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

Typical Characteristics

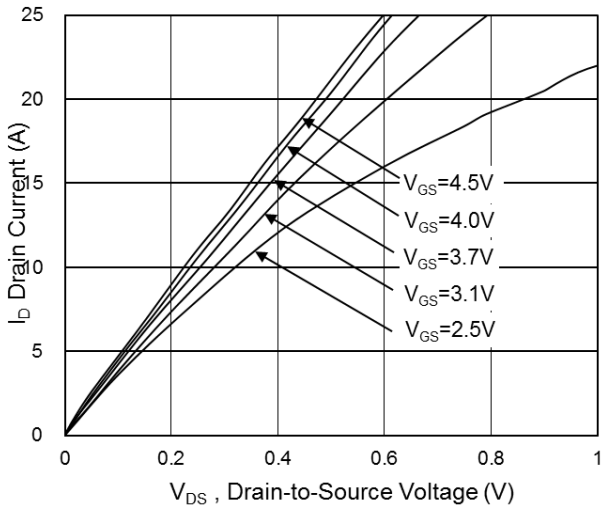


Fig.1 Typical Output Characteristics

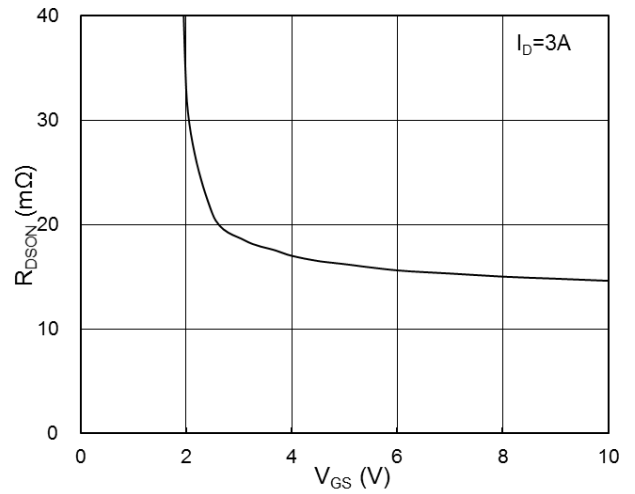


Fig.2 On-Resistance vs. Gate-Source voltage

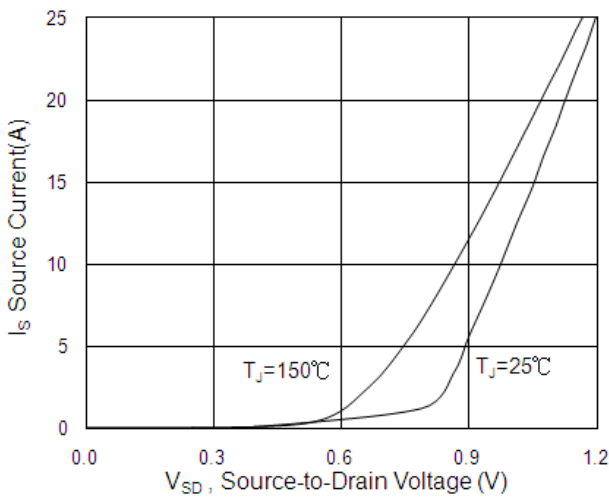


Fig.3 Forward Characteristics of Reverse

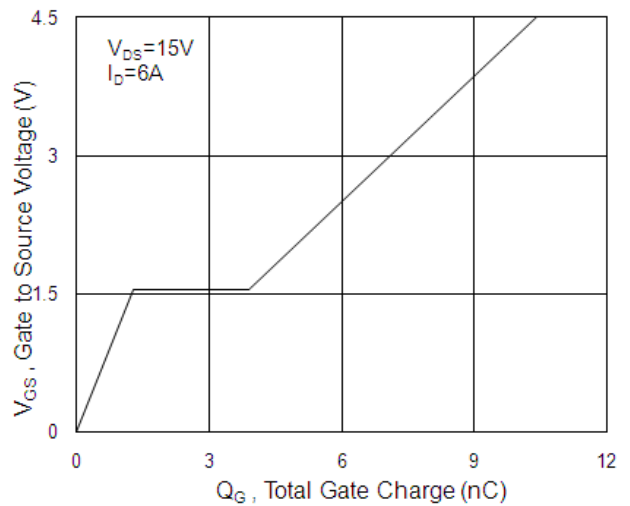


Fig.4 Gate-Charge Characteristics

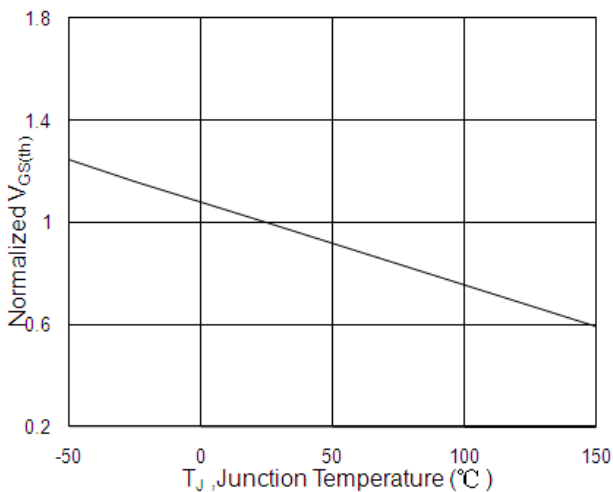


Fig.5 Normalized V_{GS(th)} vs. T_J

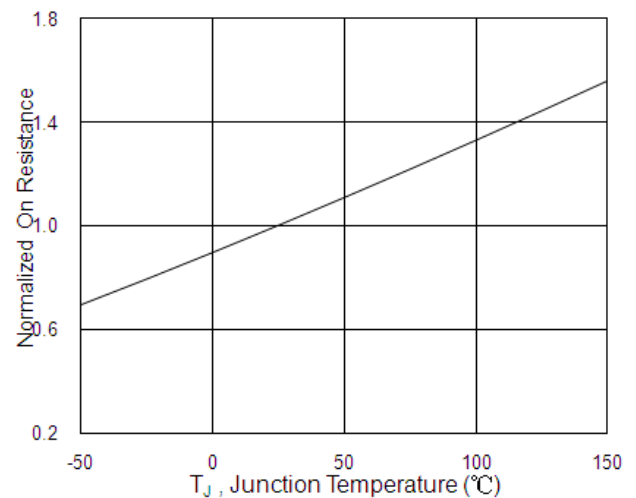


Fig.6 Normalized R_{DS(on)} vs. T_J

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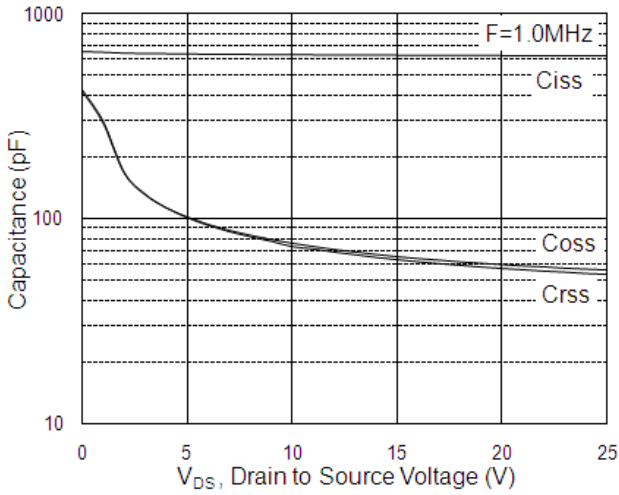


Fig.7 Capacitance

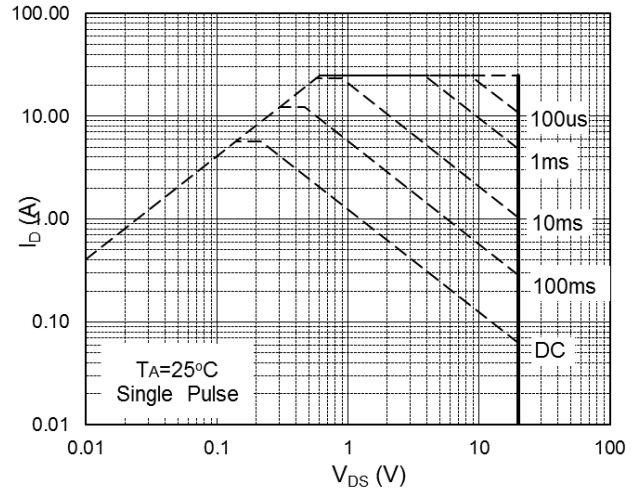


Fig.8 Safe Operating Area

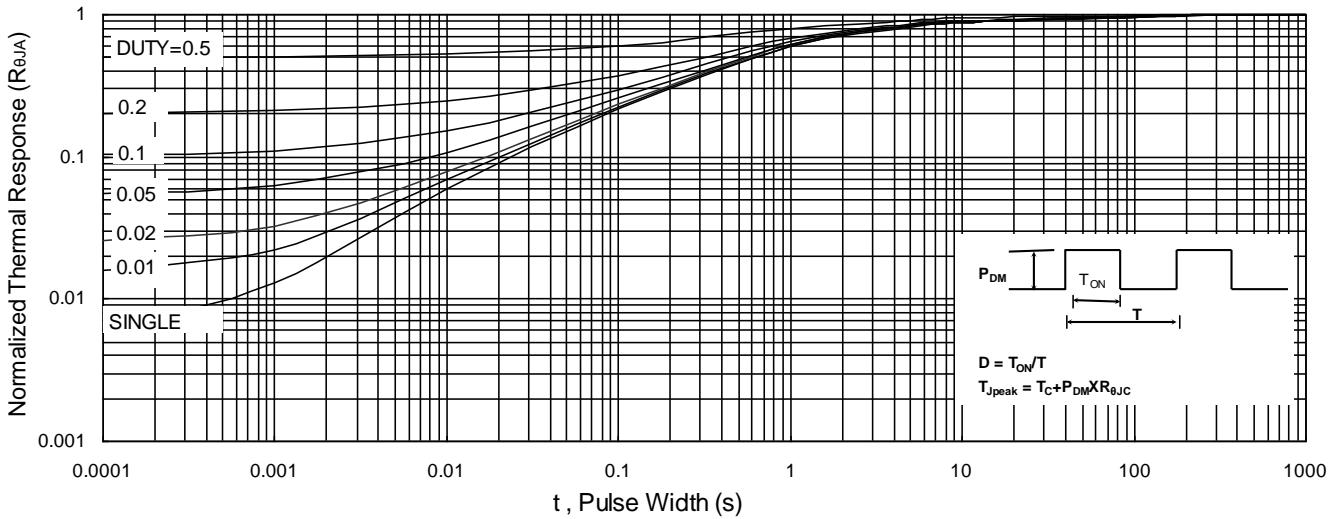


Fig.9 Normalized Maximum Transient Thermal Impedance

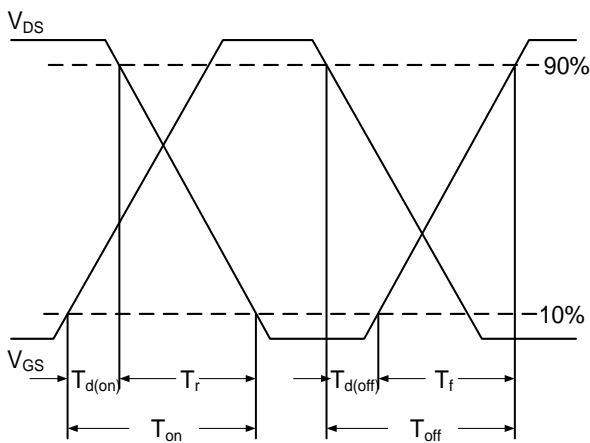


Fig.10 Switching Time Waveform

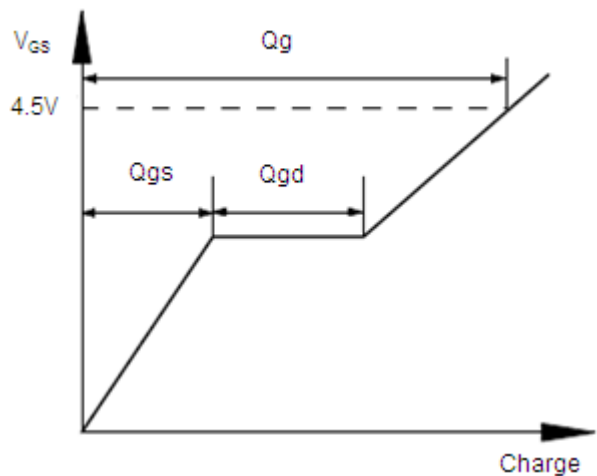
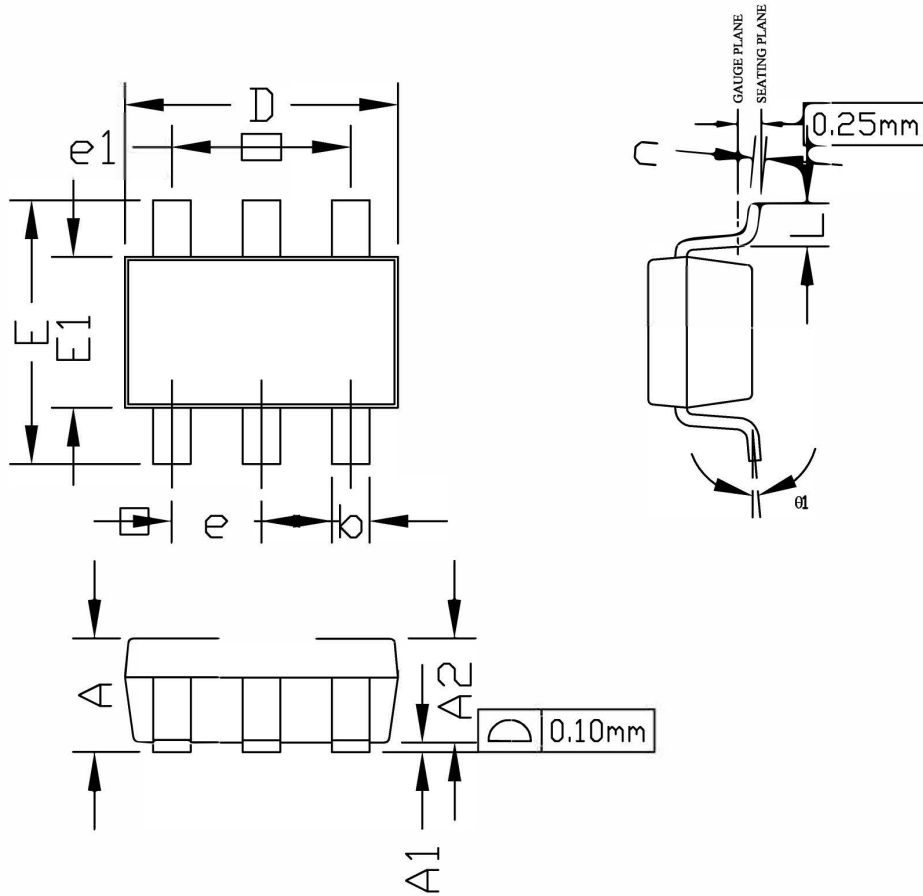


Fig.11 Gate Charge Waveform

TSOP6 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.80	1.00	1.25	E	2.50	2.80	3.10
A1	0.00	---	0.15	E1	1.50	1.60	1.70
A2	0.80	1.10	1.20	e	0.95 REF		
b	0.25	0.35	0.45	e1	1.90 REF		
c	0.08	0.13	0.20	L	0.30	0.45	0.60
D	2.70	2.90	3.10	theta1	0°		8°