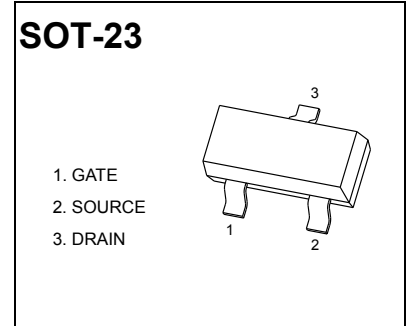


SOT-23 Plastic-Encapsulate MOSFETS

20V N-Channel Advanced Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
20V	19.4mΩ @ 4.5V	6.2A
	21.5mΩ @ 3.3V	



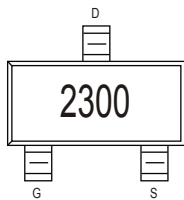
FEATURE

- Low $R_{DS(on)}$ @ $V_{GS}=4.5V$
- 3.3V Logic Level Control

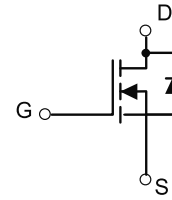
APPLICATION

- Load Switch
- DC/DC Converter
- Switching Circuits
- Power Management

MARKING



Equivalent circuit



PACKAGE SPECIFICATIONS

Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (pcs)	Box Size (mm)	QTY/Box (pcs)	Carton Size (mm)	Q'TY/Carton (pcs)
SOT-23	7'	178	3000	203×203×195	45000	438×438×220	180000

MAXIMUM RATINGS ($T_a=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	$V_{(BR)DSS}$	20	V	
Gate-Source Voltage	V_{GS}	±10		
Continuous Drain Current	I_D	$T_A=25^\circ C$	6.2	A
		$T_A=70^\circ C$	4.3	
Maximum Power Dissipation ²⁾	P_D	$T_A=25^\circ C$	1.56	W
		$T_A=70^\circ C$	0.9	
Pulsed Drain Current ¹⁾	I_{DM}	24.8	A	
Maximum Junction Temperature	T_J	150	$^\circ C$	
Storage Temperature Range	T_{stg}	-50 to 150	$^\circ C$	
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	80	$^\circ C/W$	

Notes

1) Pulse width limited by maximum junction temperature.

2) Surface Mounted on FR4 Board, $t \leq 5$ sec.



MOSFET ELECTRICAL CHARACTERISTICS

T_a=25 °C unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	20			V
Gate-body leakage	I _{GSS}	V _{GS} =±10V, V _{DS} =0V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	μA
		V _{DS} =16V, V _{GS} =0V			100	μA
On characteristics						
Gate-threshold voltage (note 1)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.45	0.6	1.0	V
Static drain-source on-resistance (note 1)	R _{DS(on)}	V _{GS} =4.5V, I _D =4A		19.4	25	mΩ
		V _{GS} =3.3V, I _D =3A		21.5	28	
Forward transconductance (note 1)	g _{FS}	V _{DS} =10V, I _D =0.25A	100			mS
Dynamic characteristics (note 2)						
Gate Resistance	R _g	f=1MHz		7.8		Ω
Total Gate C harge	Q _g	V _{DS} =10V, I _D =4A, V _{GS} =4.5V		6.6		nC
Gate-Source Charge	Q _{gs}			0.4		
Gate-Drain Charge	Q _{gd}			2		
Input capacitance	C _{iss}			457		
Output capacitance	C _{oss}	V _{DS} =10V, V _{GS} =0V, f=1MHz		71		pF
Reverse transfer capacitance	C _{rss}			66		
Switching characteristics						
Turn-on delay time (note 1,2)	t _{d(on)}	V _{DD} =10V, V _{GS} =4.5V, I _D =1A, R _G =3.3Ω		4.1		ns
Rise time (note 1,2)	t _r			11.6		
Turn-off delay time (note 1,2)	t _{d(off)}			24		
Fall time (note 1,2)	t _f			7.6		
Drain-source body diode characteristics						
Source drain current(Body Diode)	I _{SD}				0.2	A
Body diode forward voltage (note 1)	V _{SD}	I _{SD} =4A, V _{GS} = 0V		0.79	1.2	V

Notes :

1. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle 2%.
2. These parameters have no way to verify.

Typical Characteristics

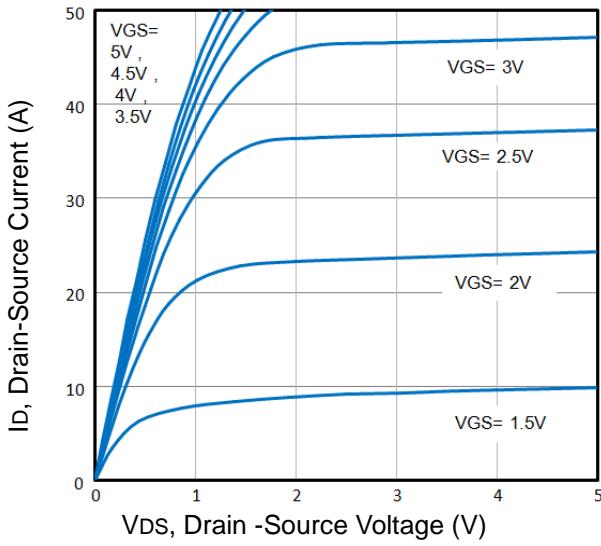


Fig1. Typical Output Characteristics

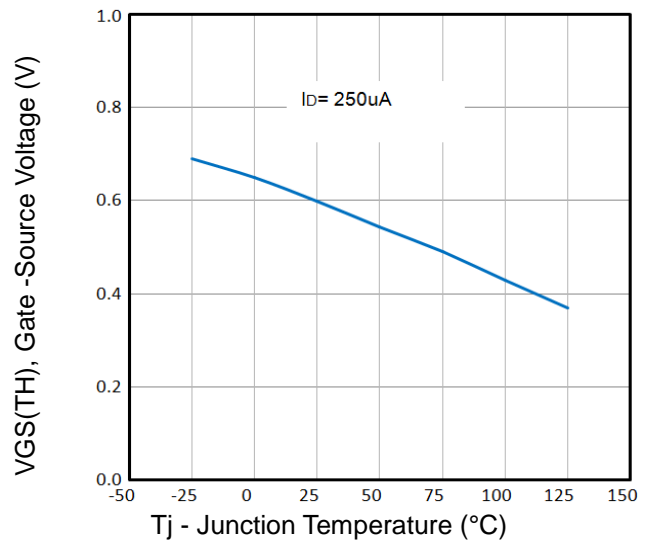


Fig2. VGS(TH) Voltage Vs. Temperature

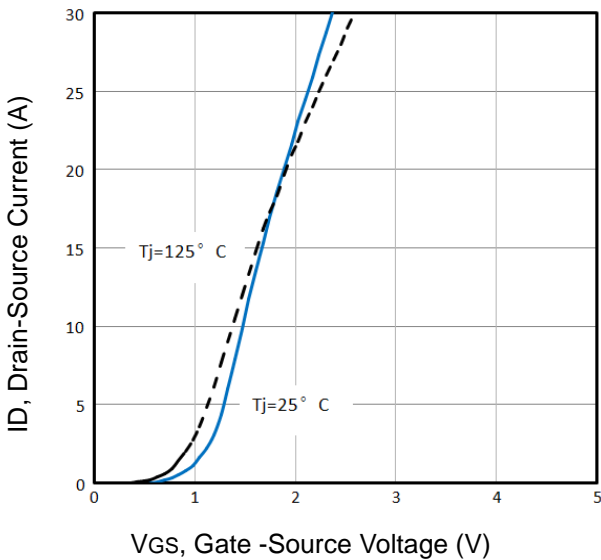


Fig3. Typical Transfer Characteristics

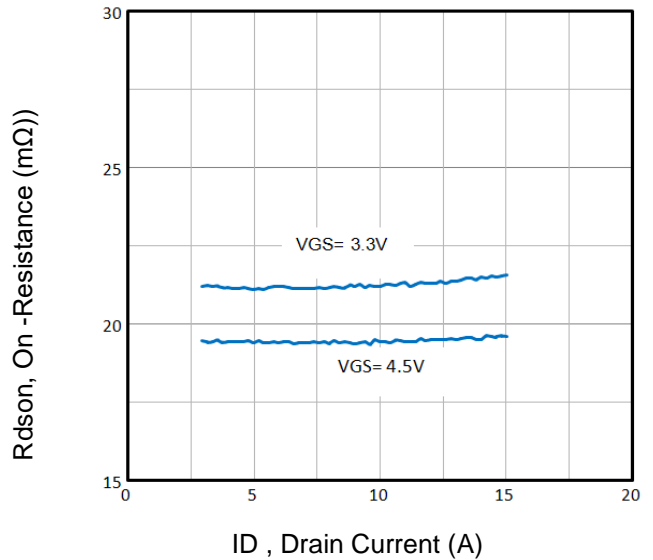


Fig4. On-Resistance vs. Drain Current and Gate

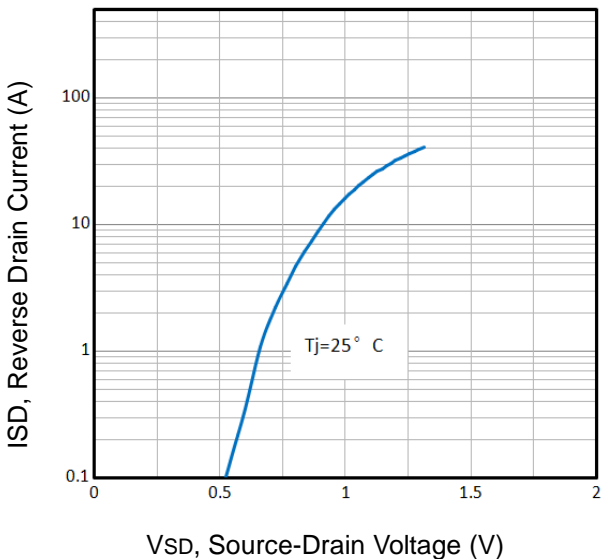


Fig5. Typical Source-Drain Diode Forward Voltage

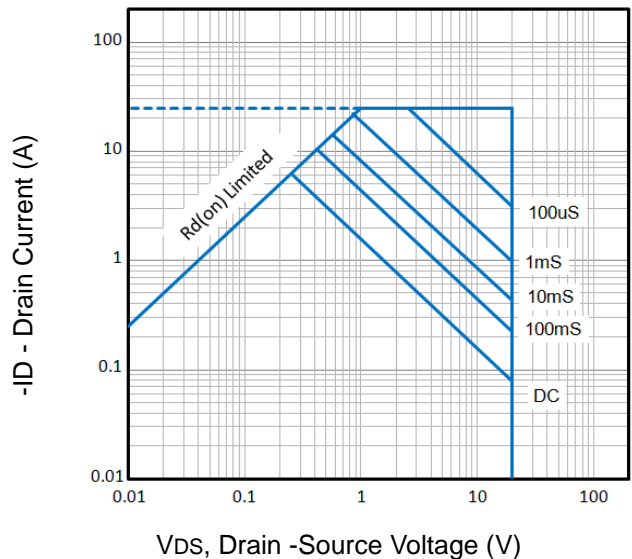


Fig6. Maximum Safe Operating Area

The curve above is for reference only.

Typical Characteristics

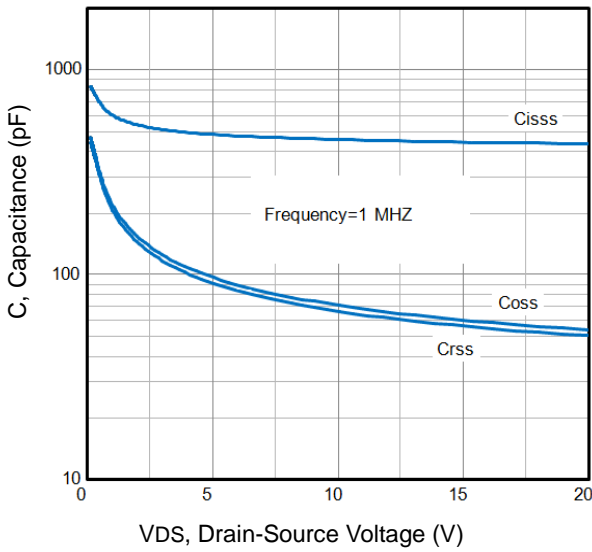


Fig7. Typical Capacitance Vs. Drain-Source Voltage

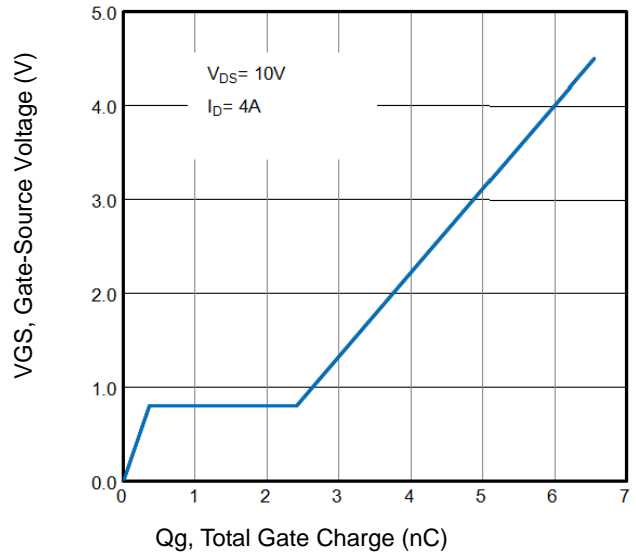


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

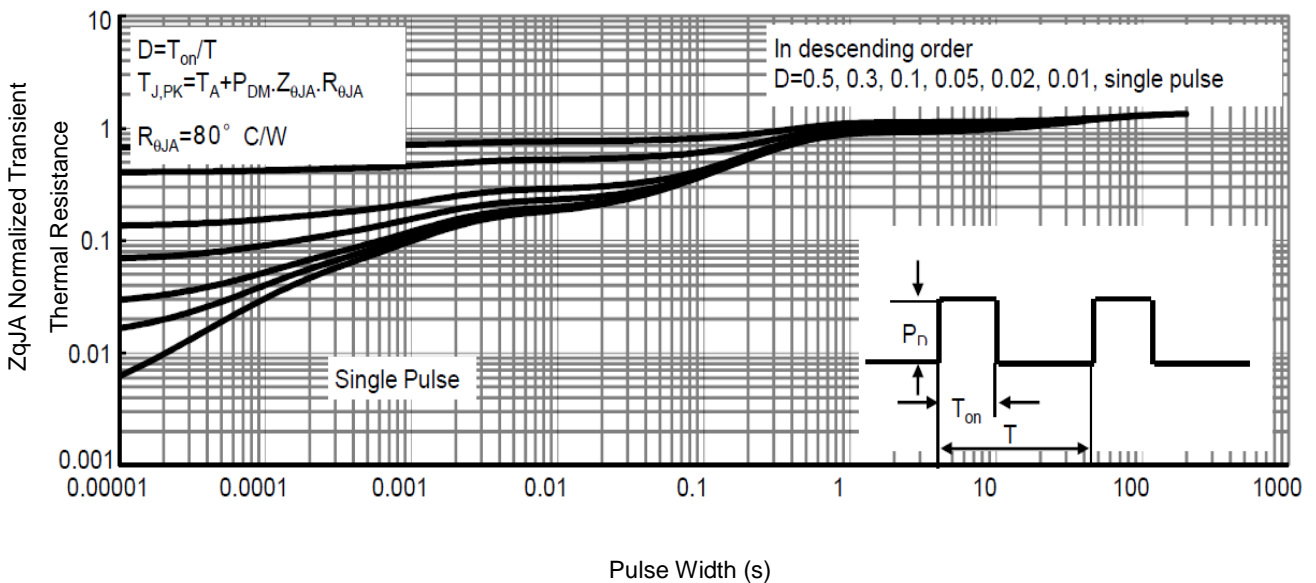


Fig9. Normalized Maximum Transient Thermal Impedance

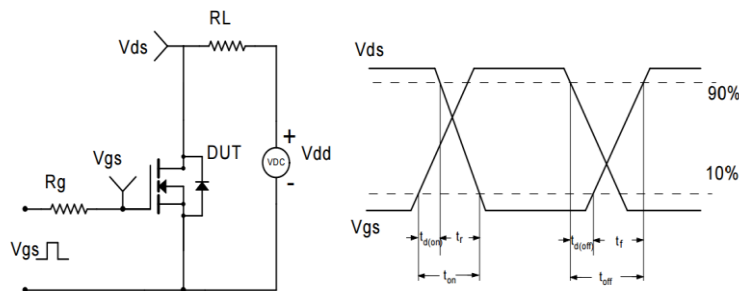
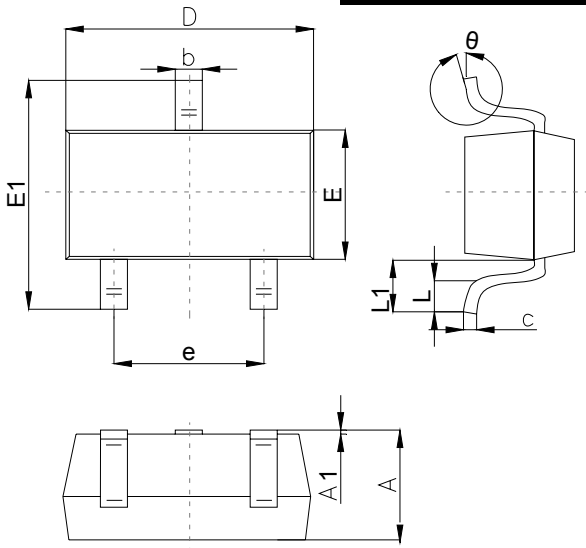
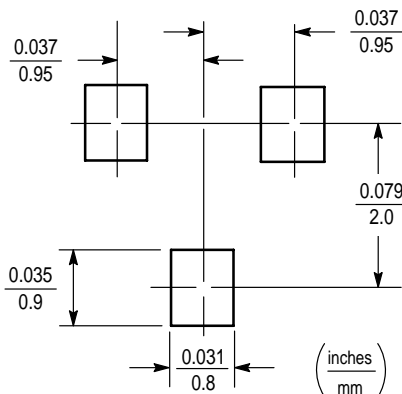


Fig10. Switching Time Test Circuit and waveforms

The curve above is for reference only.

Outline Drawing
SOT-23 Package Outline Dimensions


Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	1.00		1.40
A1			0.10
b	0.35		0.50
c	0.10		0.20
D	2.70	2.90	3.10
E	1.40		1.60
E1	2.4		2.80
e		1.90	
L	0.10		0.30
L1	0.4		
θ	0°		10°

Suggested Pad Layout

Note:

1. Controlling dimension: in/millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

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