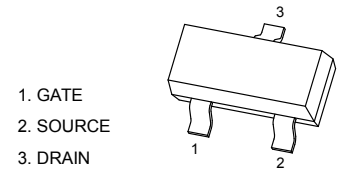


SOT-23 Plastic-Encapsulate MOSFETS

20V P-Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)Typ}$	$I_D Max$
-20V	37mΩ@ -4.5V	-4.8A
	43mΩ@ -3.3V	

SOT-23



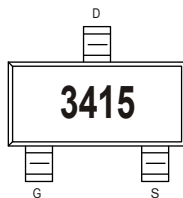
FEATURE

- Excellent $R_{DS(ON)}$, low gate charge, low gate voltages

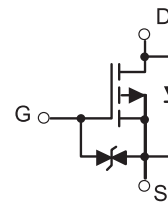
APPLICATION

- Load switch and in PWM applications

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 and Thermal Characteristics (TA = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{(BR)DSS}$	-20	V
Gate-Source Voltage	V_{GS}	±8	
Continuous Drain Current	I_D	$T_A = 25^\circ C$ -4.8	A
		$T_A = 70^\circ C$ -3.6	
Pulsed Drain Current ¹⁾	I_{DM}	-30	A
Maximum Power Dissipation ²⁾	P_D	$T_A = 25^\circ C$ 1.5	W
		$T_A = 70^\circ C$ 1.0	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-50 to 150	°C
Junction-to-Ambient Thermal Resistance (PCB mounted) ²⁾	R_{thJA}	80	°C/W

Notes

- Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board, $t \leq 5$ sec.

The above data are for reference only.



MOSFET ELECTRICAL CHARACTERISTICS

 $T_a=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Static Parameters						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D =-250μA	-20			V
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.4	-0.7	-1.2	
Zero gate voltage drain current	I _{DSS}	V _{DS} =20V, V _{GS} =0V (TA=25℃)			-1	μA
		V _{DS} =16V, V _{GS} =0V (TA=125℃)			-100	
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±8V			±10	
Drain-source on-state resistance(note1)	R _{DS(on)}	V _{GS} =-4.5V, I _D =-4A		37	45	mΩ
		V _{GS} =-3.3V, I _D =-3A		43	55	
		V _{GS} =-2.5V, I _D =-2A		52	65	
Forward transconductance(note2)	g _{FS}	V _{DS} =-5V, I _D =-4A	8			S
Dynamic Parameters (note3)						
Input capacitance	C _{iss}	V _{DS} =-10V,V _{GS} =0V,f =1MHz		675		pF
Output capacitance	C _{oss}			120		
Reverse transfer capacitance	C _{rss}			85		
Gate resistance	R _g	V _{DS} =0V,V _{GS} =0V,f =1MHz		6.5		Ω
Switching Parameters						
Total gate charge	Q _g	V _{DS} =-10V,V _{GS} =-4.5V,I _D =-4A		14.2		nC
Gate-Source charge	Q _{gs}			3.2		
Gate-drain charge	Q _{gd}			5.8		
Turn-on delay time (note3)	t _{d(on)}	V _{DS} =-10V, V _{GS} =-4.5V R _{GEN} =3Ω, R _L =2.5Ω,		15		ns
Turn-on rise time(note3)	t _r			11		
Turn-off delay time(note3)	t _{d(off)}			22		
Turn-off fall time(note3)	t _f			35		
Drain-source body diode characteristics						
Continuous source-drain diode current	I _S	T _C =25℃			-2.0	A
Body diode voltage (note 2)	V _{SD}	I _S =-2A,V _{GS} =0V		-0.83	-1.2	V

Notes:

- 1) PR repetitive rating, pulse width limited by junction temperature.
- 2) Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 3) These parameters have no way to verify.

Typical Characteristics

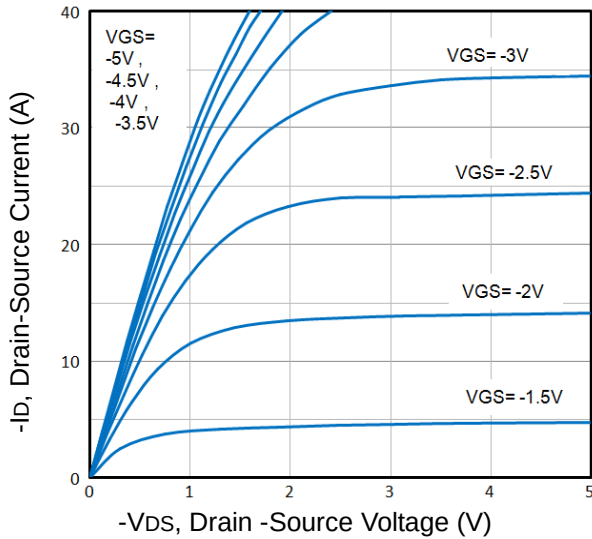


Fig1. Typical Output Characteristics

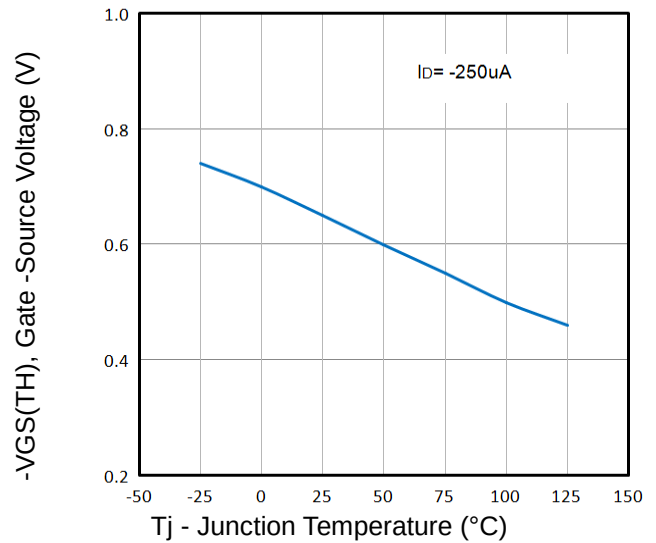


Fig2. Normalized Threshold Voltage Vs. Temperature

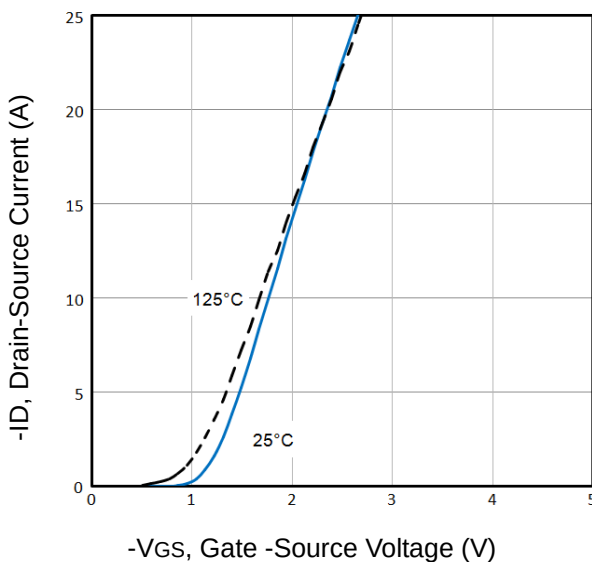


Fig3. Typical Transfer Characteristics

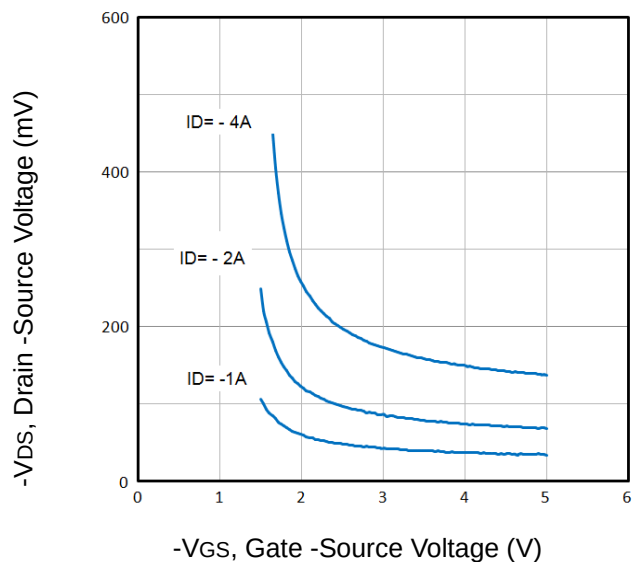


Fig4. Drain-Source Voltage vs Gate-Source Voltage

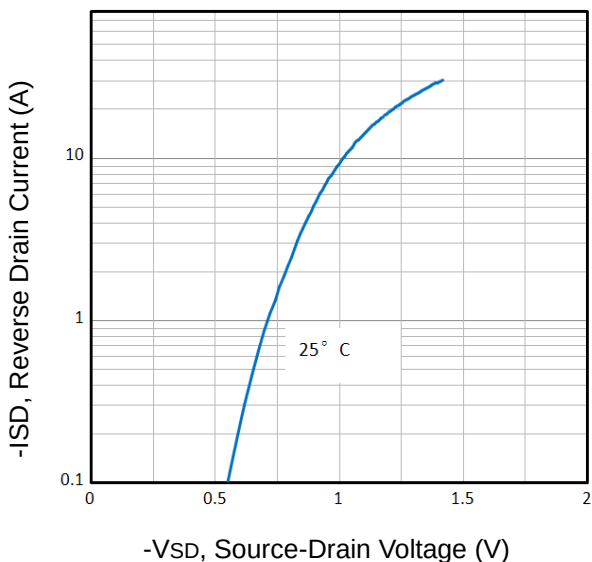


Fig5. Typical Source-Drain Diode Forward Voltage

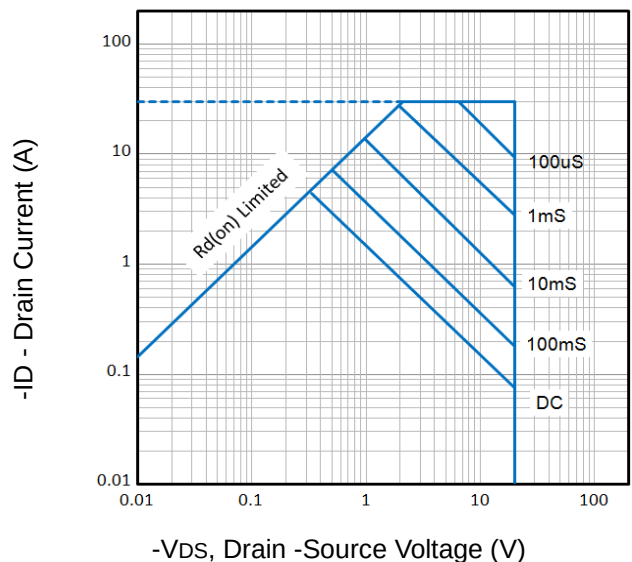


Fig6. Maximum Safe Operating Area

Typical Characteristics

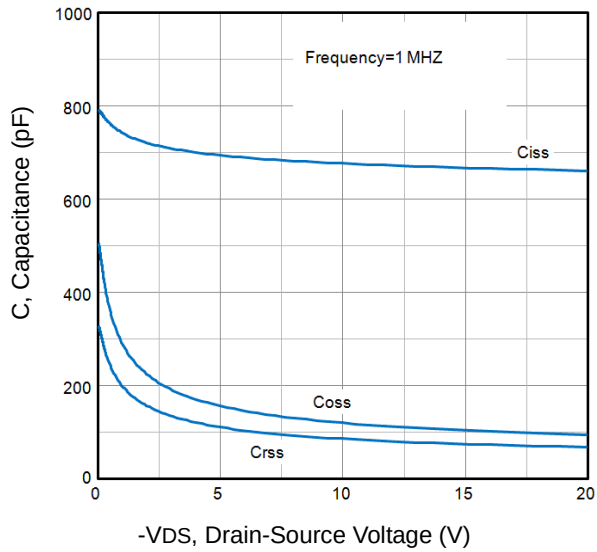


Fig7. Typical Capacitance Vs. Drain-Source Voltage

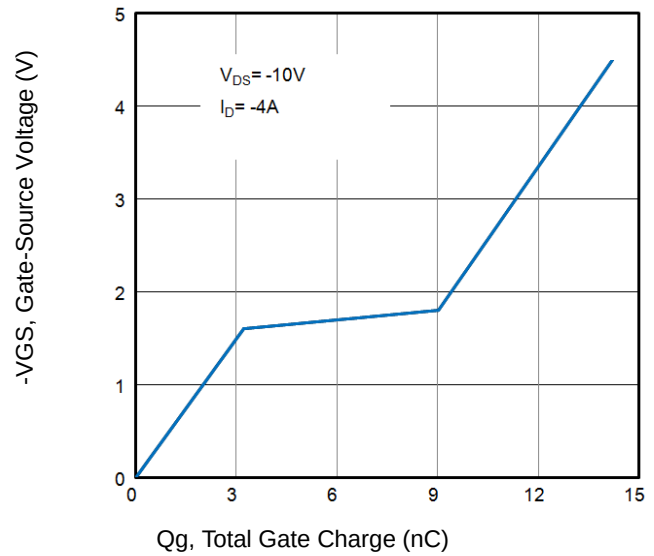


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

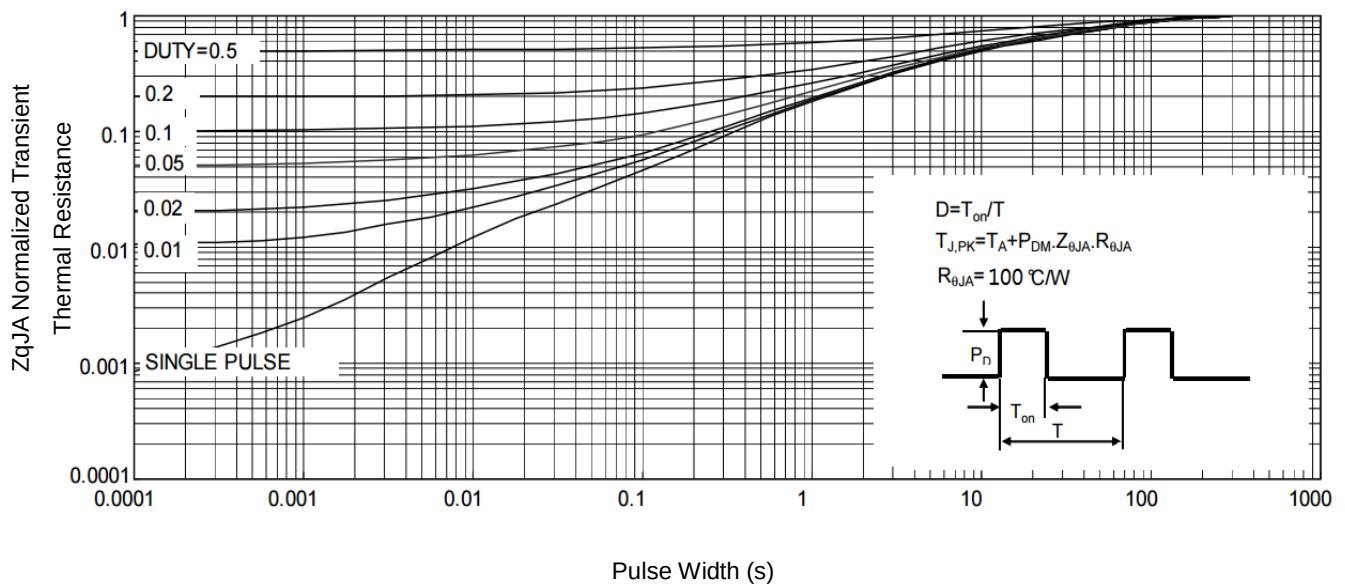


Fig9. Normalized Maximum Transient Thermal Impedance

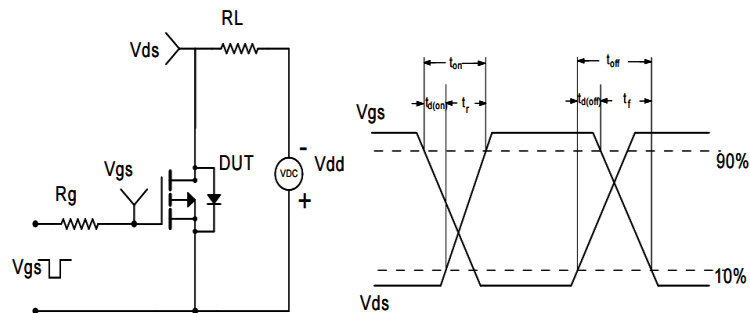
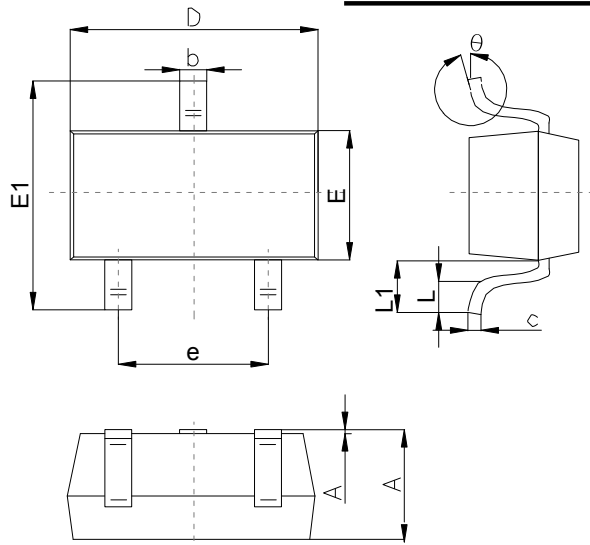


Fig10. Switching Time Test Circuit and waveforms

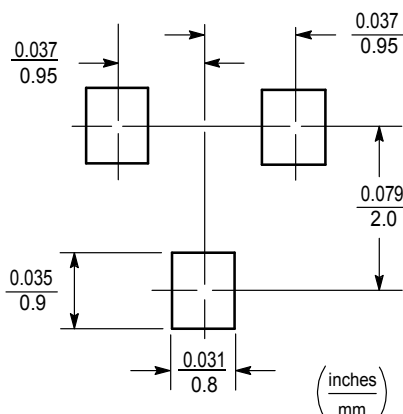
Outline Drawing

SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	0.90		1.40
A1	0.00		0.10
b	0.30		0.50
c	0.08		0.20
D	2.80	2.90	3.10
E	1.20		1.60
E1	2.25		2.80
e	1.80	1.90	2.00
L	0.10		0.50
L1	0.4		0.55
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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