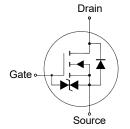
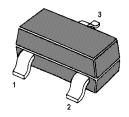
N-Channel Enhancement Mode MOSFET

Features

- · Advanced trench cell design
- · High speed switch
- Built-in G-S Protection Diode
- Typical ESD Protection HBM Class 1C

Classification	Voltage Range(V)
0A	< 125
0B	125 to < 250
1A	250 to < 500
1B	500 to < 1000
1C	1000 to < 2000
2	2000 to < 4000
3A	4000 to < 8000
3B	≥ 8000





1. Gate 2. Source 3. Drain SOT-23 Plastic Package

Applications

- Portable appliances
- · Load switch appliances

Absolute Maximum Ratings (at Ta = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	60	V
Gate-Source Voltage	V _G s	± 20	V
Drain Current	ID	360	mA
Peak Drain Current, Pulsed (tp < 10 μs)	I _{DM}	1.2	Α
Power Dissipation	P _D	350 ¹⁾ 420 ²⁾	mW
Operating Junction Temperature Range	Tj	- 55 to + 150	°C
Storage Temperature Range	T _{stg}	- 55 to + 150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient	Reja	357 ¹⁾ 300 ²⁾	°C/W

¹⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad.



²⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.

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Characteristics at T_a = 25°C unless otherwise specified

Parameter	Symbol	Min.	Тур.	Max.	Unit
STATIC PARAMETERS	<u>'</u>		<u> </u>	<u> </u>	<u> </u>
Drain-Source Breakdown Voltage at I _D = 250 µA	V _{(BR)DSS}	60	-	-	V
Drain-Source Leakage Current at V _{DS} = 60 V	I _{DSS}	ı	-	1	μΑ
Gate-Source Leakage Current at $V_{GS} = \pm 20 \text{ V}$ at $V_{GS} = \pm 10 \text{ V}$	Igss		-	10 1	μA
Gate-Source Threshold Voltage at V _{GS} = V _{DS} , I _D = 250 μA	V _{GSth}	0.48	-	1.6	V
Drain-Source On-State Resistance at V_{GS} = 10 V, I_D = 350 mA at V_{GS} = 4.5 V, I_D = 200 mA at V_{GS} = 2.5 V, I_D = 10 mA	R _{DS(ON)}	-	- - -	1.6 2.2 6.5	Ω
DYNAMIC PARAMETERS					
Forward Transconductance at $V_{DS} = 5 \text{ V}$, $I_D = 400 \text{ mA}$	g FS	-	755	-	mS
Gate resistance at $V_{DS} = 0 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$	R_g	-	38	-	Ω
Input Capacitance at $V_{DS} = 10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$	Ciss	-	51.3	-	pF
Output Capacitance at $V_{DS} = 10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$	Coss	-	11.6	-	pF
Reverse Transfer Capacitance at $V_{DS} = 10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$	Crss	1	8.2	-	pF
Gate charge total at $V_{DS} = 30 \text{ V}$, $I_D = 1 \text{ A}$, $V_{GS} = 10 \text{ V}$ at $V_{DS} = 30 \text{ V}$, $I_D = 1 \text{ A}$, $V_{GS} = 4.5 \text{ V}$	Qg	-	1.3 0.85	- -	nC
Gate to Source Charge at V_{DS} = 30 V, I_D = 1 A, V_{GS} = 10 V	Q _{gs}	-	0.45	-	nC
Gate to Drain Charge at V_{DS} = 30 V, I_D = 1 A, V_{GS} = 10 V	Q_{gd}	ı	0.3	-	nC
Turn-On Delay Time at V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 1 A, R_G = 51 Ω	t _{d(on)}	-	13.4	-	ns
Turn-On Rise Time at V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 1 A, R_G = 51 Ω	t _r	-	13.3	-	ns
Turn-Off Delay Time at V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 1 A, R_G = 51 Ω	$t_{\text{d(off)}}$	-	7.8	-	ns
Turn-Off Fall Time at V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 1 A, R_G = 51 Ω	t _f	-	4.6	-	ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at I _S = 300 mA	VsD	0.47	-	1.2	V
Body-Diode Continuous Current	ls	-	-	360	mA
Body Diode Reverse Recovery Time at $I_S = 1$ A, di/dt = 100 A / μ s	t _{rr}	-	9.2	-	ns
Body Diode Reverse Recovery Charge at I _S = 1 A, di/dt = 100 A / μs	Qrr	-	3.7	-	nC



Electrical Characteristics Curves

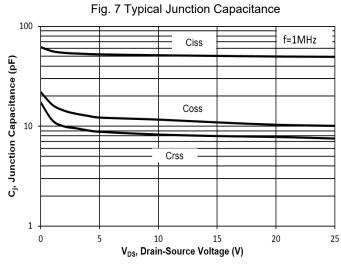
Fig. 2 Typical Transfer Characteristics Fig. 1 Typical Output Characteristics 2 1 V_{DS} =5VV_{GS}=4.5V 1.8 0.9 Tj=25°C V_{GS}=4V 1.6 0.8 1.4 Drain Current (A)
1.2
1
0.8
0.6 Drain Current (A) 0.7 V_{GS}=3V 0.6 Tj=125°C 0.5 V_{GS}=2.5V 0.4 0.3 مُ 0.4 0.2 V_{GS}=2V 0.2 0.1 V_{GS} =1.5V0 0 0 4 0 4 V_{DS}, Drain-to-Source Voltage (V) V_{GS}, Gate-Source Voltage (V) Fig. 3 On-Resistance vs. Drain Current Fig. 4 On-Resistance vs. Gate-Source Voltage 4 5 ID=0.35A $R_{DS(on)}$, Drain-to-Source on Resistance(Ω) $R_{\text{DS(on)}}$, Drain-to-Source On Resistance (Ω) 3 Tj=125℃ Vgs=2.5V 2 Vgs=4.5V Tj=25°C 0 0 0.4 0 0.1 0.2 0.3 0.5 0.6 2 2.5 3.5 4.5 3 I_D, Drain Current (A) V_{GS}, Gate-to-Source Voltage (V) Fig. 5 On-Resistance vs.Tj Fig. 6 Typical Body-Diode Forward Characteristics 2.2 2 Reverse Drain Current (A) RDS(on), Normalized Drain-to-Source OnResistance 1.8 Vgs=4.5V,ID=0.2A 1.6 0.1 Tj=25°C Tj=125°C Vgs=2.5V,ID=0.01A 1.2 0.8 0.01 25 50 75 100 125 150 175 0.2 1.2



V_{SD}, Source-to-Drain Voltage (V)

T_J, Junction Temperature (℃)

Electrical Characteristics Curves



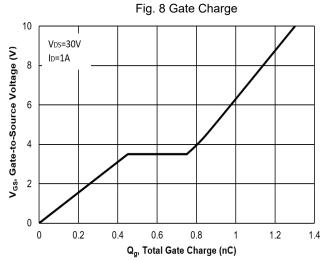
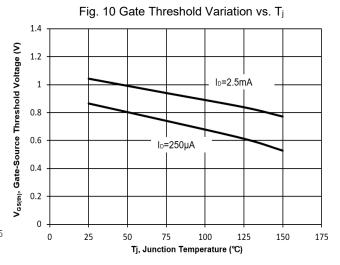
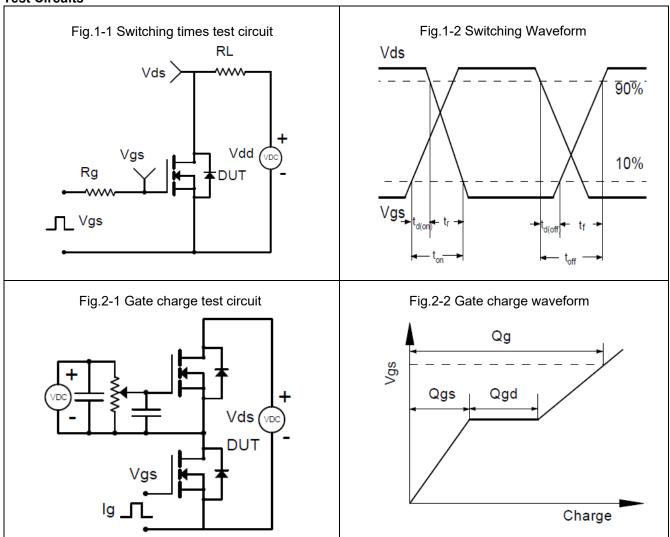


Fig. 9 $V_{(BR)DSS}$ vs. Junction Temperature V_{DSS}, Drain-Source Breakdown Voltage (V) I_D=250μA T_J, Junction Temperature (°C)



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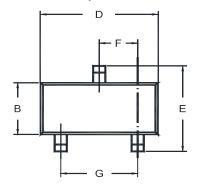
Test Circuits

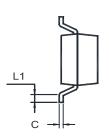


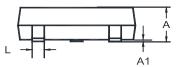


Package Outline (Dimensions in mm)

SOT-23

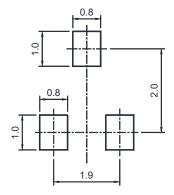






Unit	Α	A1	В	С	D	Е	F	G	L	L1
	1.20	0.100	1.40	0.19	3.04	2.6	1.02	2.04	0.51	0.2
mm	0.89	0.013	1.20	0.08	2.80	2.2	0.89	1.78	0.37	MIN

Recommended Soldering Footprint



Packing information

	Tucking information								
	Package Tape Width (mm)	Tape Width	Pitch		Reel Size		5 5 15 1: 0 ::		
		(mm)	mm	inch	mm	inch	Per Reel Packing Quantity		
	SOT-23	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000		

Marking information

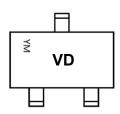
" VD " = Part No.

" YM " = Date Code Marking

" Y " = Year

" M " = Month

Font type: Arial



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