

SOT-23 Plastic-Encapsulate MOSFETS

TF2319

TF2319 P-Channel 40-V(D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)(typ)}$ (Ω)	I_D (A)
- 40	0.065 at $V_{GS} = - 10$ V	- 5.0
	0.085 at $V_{GS} = - 4.5$ V	- 4.0

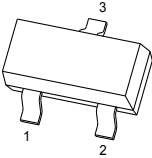
General FEATURE

- TrenchFET Power MOSFET
- Lead free product is acquired
- Surface mount package

APPLICATION

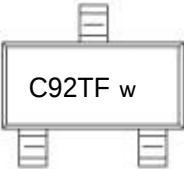
- Load Switch for Portable Devices
- DC/DC Converter

SOT-23



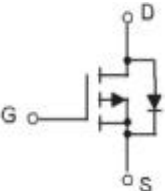
1.GATE
2.SOURCE
3.DRAIN

MARKING



*w: week code

Equivalent Circuit



ABSOLUTE MAXIMUM RATINGS $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	- 40	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150\text{ }^{\circ}\text{C}$) ^{a, b}	$T_A = 25\text{ }^{\circ}\text{C}$	I_D	- 5.0	A
Pulsed Drain Current		I_{DM}	- 20	
Maximum Power Dissipation ^{a, b}	$T_A = 25\text{ }^{\circ}\text{C}$	P_D	1.25	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	$^{\circ}\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	$t \leq 5$ s	R_{thJA}	75	100	$^{\circ}\text{C/W}$
	Steady State		120	160	
Maximum Junction-to-Lead ^a	Steady State	R_{thJL}	40	50	

Notes:

a. Surface Mounted on FR4 Board.

b. $t \leq 5$ s.

SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-40	-	-	V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-1.0	-1.6	-2.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -36\text{ V}, V_{GS} = 0\text{ V}$	-	-	-50	nA
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -10\text{ V}$	-6	-	-	A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -5.0\text{ A}$	-	0.065	0.082	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -4.0\text{ A}$	-	0.84	0.100	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}, I_D = -5.0\text{ A}$	-	7.0	-	S
Diode Forward Voltage	V_{SD}	$I_S = -2.0\text{ A}, V_{GS} = 0\text{ V}$	-	-0.8	-1.20	V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = -20\text{ V}, V_{GS} = -10\text{ V}$ $I_D \equiv -5\text{ A}$	-	11.8	-	nC
Gate-Source Charge	Q_{gs}		-	2.2	-	
Gate-Drain Charge	Q_{gd}		-	3.0	-	
Input Capacitance	C_{iss}	$V_{DS} = -20\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	-	553	-	pF
Output Capacitance	C_{oss}		-	50	-	
Reverse Transfer Capacitance	C_{rss}		-	42	-	
Switching ^c						
Turn-On Time	$t_{d(on)}$	$V_{DS} = -20\text{ V}, V_{GS} = -10\text{ V RL}$ $= 2.5\Omega, R_G = 3\Omega$	-	7	-	ns
	t_r		-	6.5	-	
Turn-Off Time	$t_{d(off)}$		-	24	-	
	t_f		-	7.8	-	

Notes

- a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

Typical Characteristics

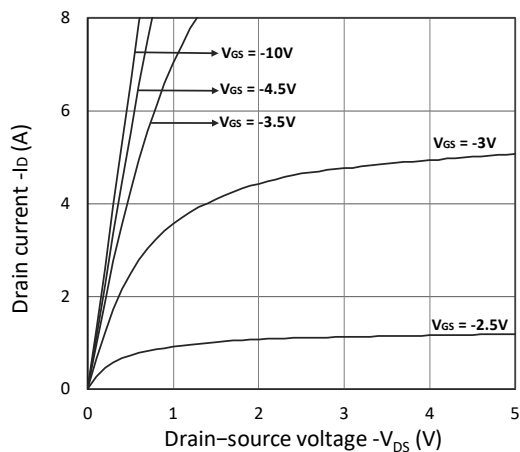


Figure 1. Output Characteristics

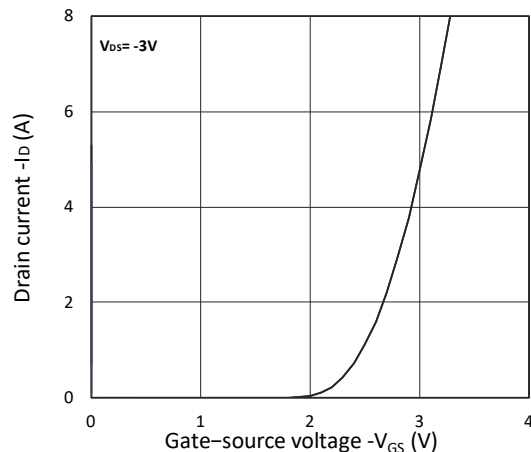


Figure 2. Transfer Characteristics

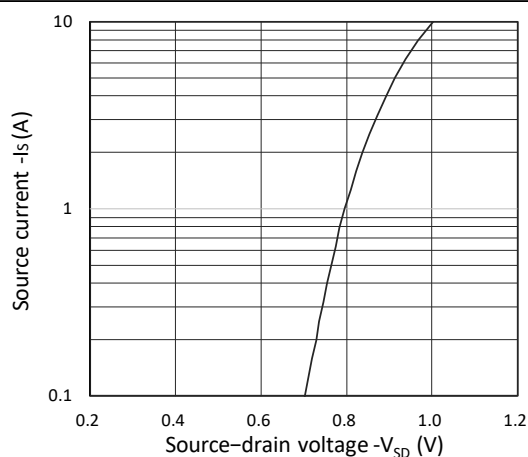


Figure 3. Forward Characteristics of Reverse

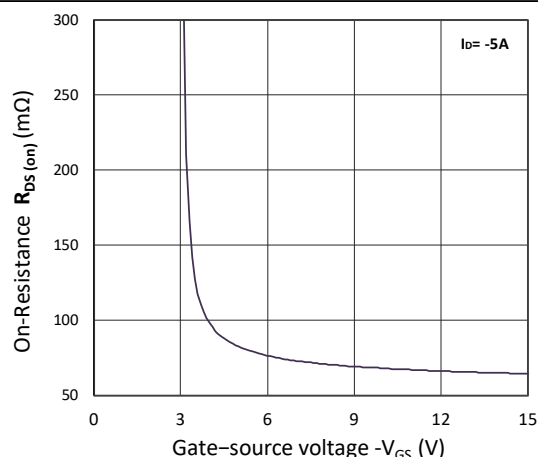


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

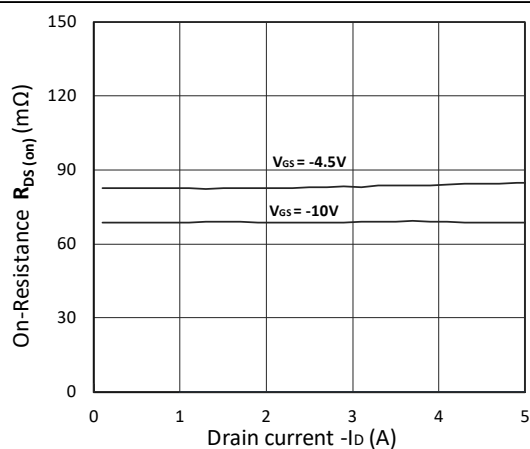


Figure 5. $R_{DS(ON)}$ vs. I_D

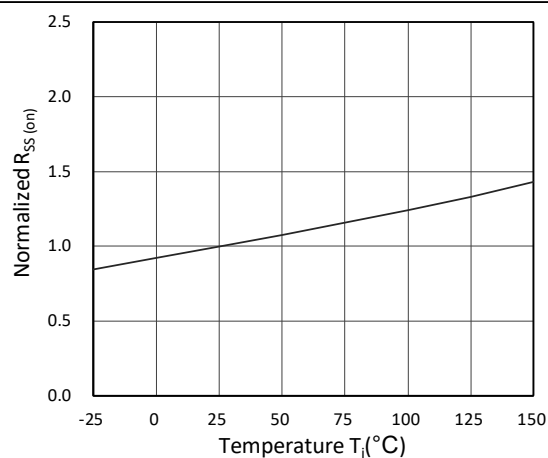
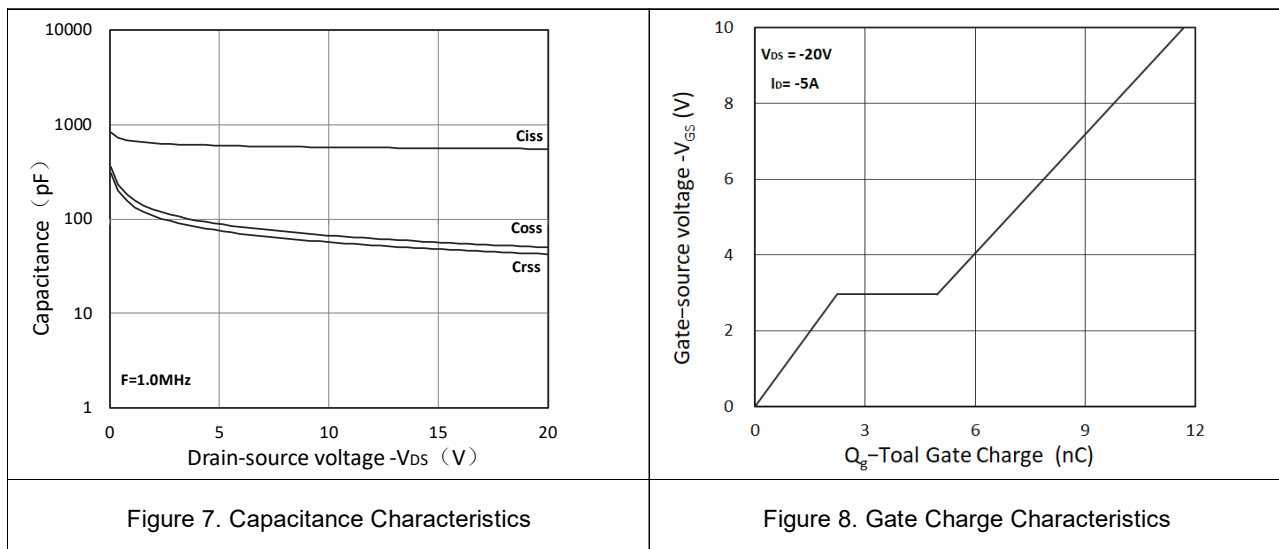


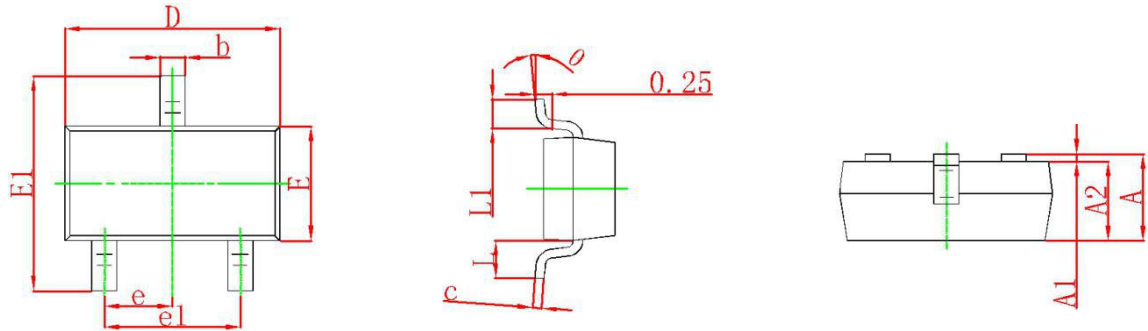
Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature



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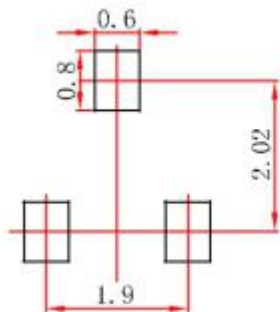
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SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 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.