

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	0.055 at $V_{GS} = - 10$ V	- 5.0
	0.065 at $V_{GS} = - 4.5$ V	- 4.0

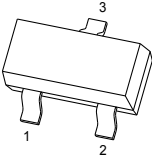
General FEATURE

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

APPLICATION

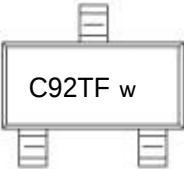
- Load Switch for Portable Devices
- DC/DC Converter

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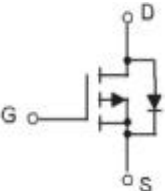
1.GATE
2.SOURCE
3.DRAIN

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.

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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 V, I _D = -250 μA	-40	-	-	V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-1.0	-1.6	-2.5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V	-	-	±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -36 V, V _{GS} = 0 V	-	-	-50	nA
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≤ -5 V, V _{GS} = -10 V	-6	-	-	A
Drain-Source On-Resistance ^a	r _{DS(on)}	V _{GS} = -10 V, I _D = -5.0 A	-	0.055	0.070	Ω
		V _{GS} = -4.5 V, I _D = -4.0 A	-	0.065	0.085	
Forward Transconductance ^a	g _{fs}	V _{DS} = -5 V, I _D = -5.0 A	-	7.0	-	S
Diode Forward Voltage	V _{SD}	I _S = -2.0A, V _{GS} = 0 V	-	-0.8	-1.20	V
Dynamic ^b						
Total Gate Charge	Q _g	V _{DS} = -20 V, V _{GS} = -10 V I _D ≡ -5A	-	8.5	-	nC
Gate-Source Charge	Q _{gs}		-	1.0	-	
Gate-Drain Charge	Q _{gd}		-	2.0	-	
Input Capacitance	C _{iss}	V _{DS} = -20 V, V _{GS} = 0, f = 1 MHz	-	419	-	pF
Output Capacitance	C _{oss}		-	45	-	
Reverse Transfer Capacitance	C _{rss}		-	37	-	
Switching ^c						
Turn-On Time	t _{d(on)}	V _{DS} = -20V, V _{GS} = -10V RL = 2.5Ω,RG=3Ω	-	7	-	ns
	t _r		-	6.5	-	
Turn-Off Time	t _{d(off)}		-	24	-	
	t _f		-	7.8	-	

Notes

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

Typical Characteristics

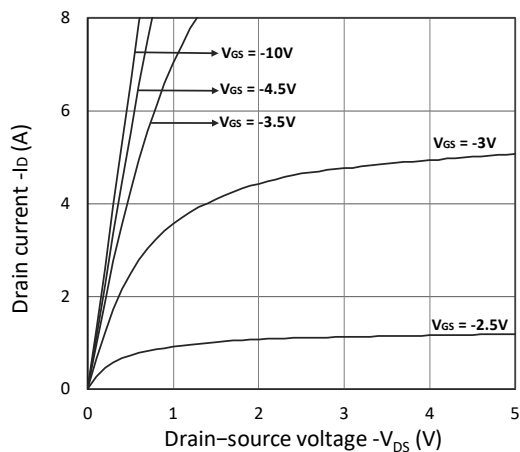


Figure 1. Output Characteristics

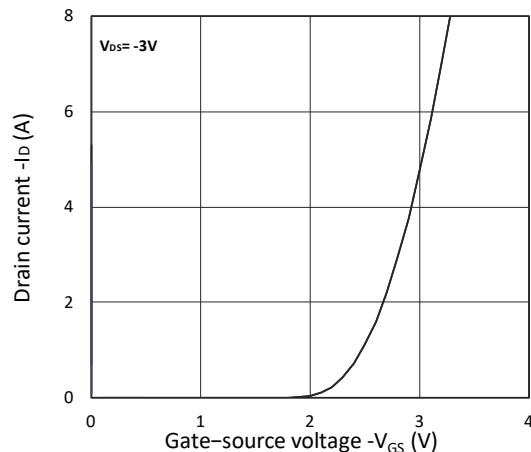


Figure 2. Transfer Characteristics

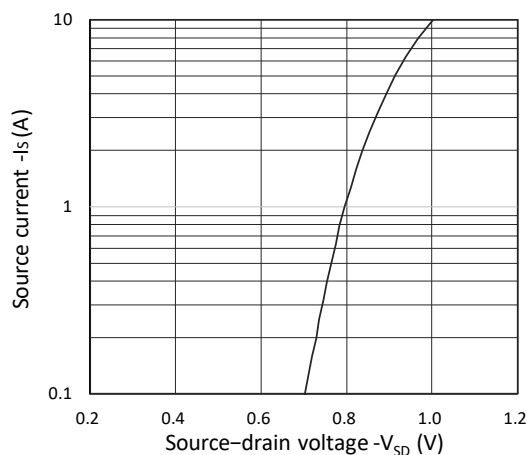


Figure 3. Forward Characteristics of Reverse

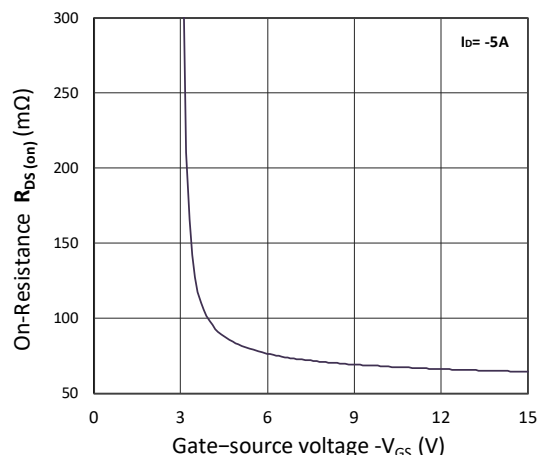


Figure 4. $R_{DS(on)}$ vs. V_{GS}

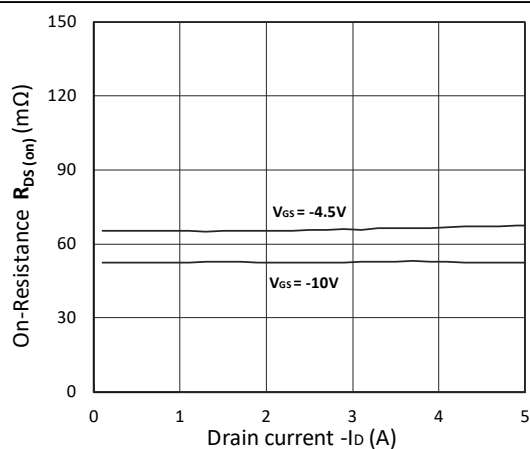


Figure 5. $R_{DS(on)}$ vs. I_D

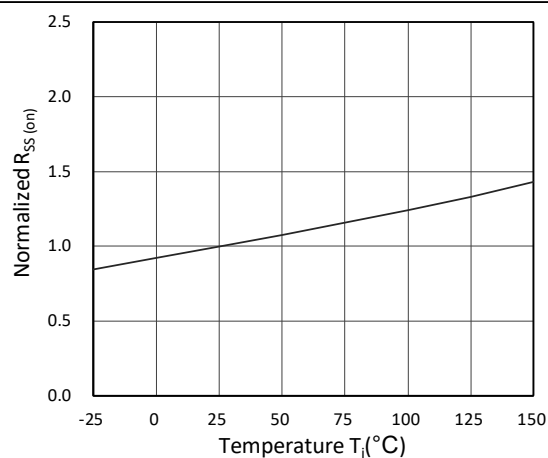
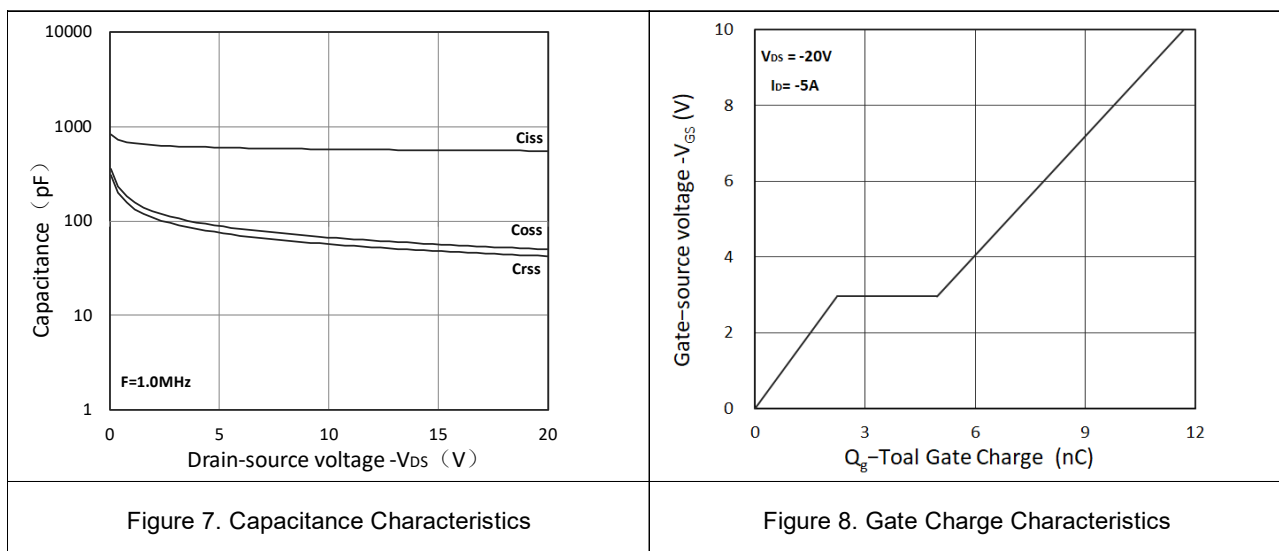


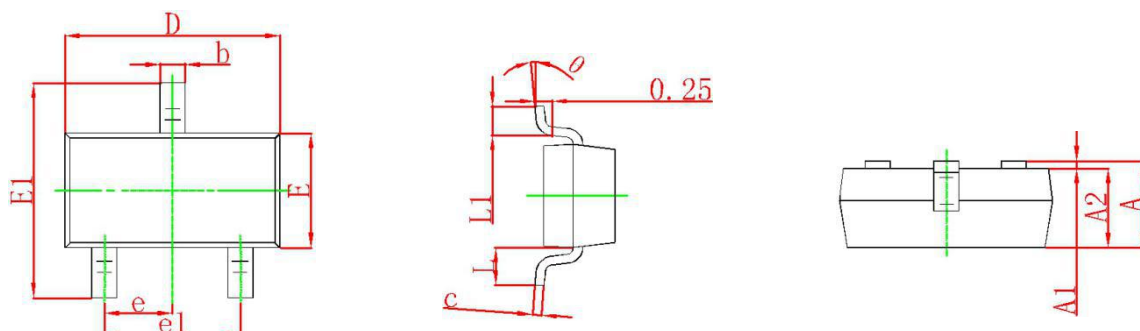
Figure 6. Normalized $R_{DS(on)}$ vs. Temperature



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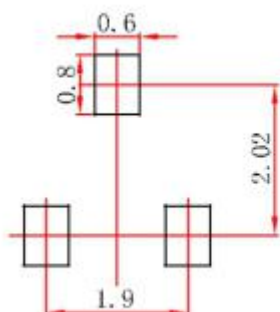
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SOT-23 Package Outline Dimensions



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.