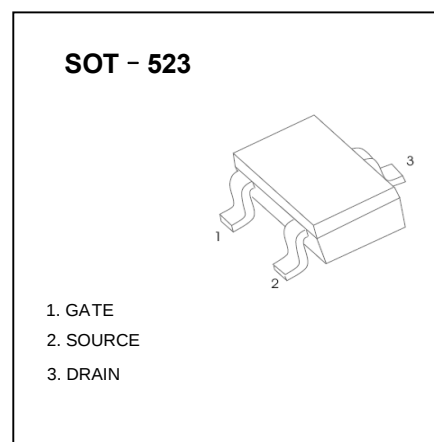
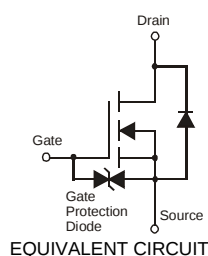


SOT-523 Plastic-Encapsulate MOSFETS

TW1012T N-CHANNEL ENHANCEMENT MODE MOSFET

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Lead Free By Design/RoHS Compliant (Note 2)
- ESD Protected up to 2kV



Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V _{DSS}	20	V
Gate-Source Voltage			V _{GSS}	±6	V
Continuous Drain Current (Note 1)	Steady State	T _A = 25°C	I _D	0.63	A
		T _A = 85°C		0.45	
Pulsed Drain Current			I _{DM}	6	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

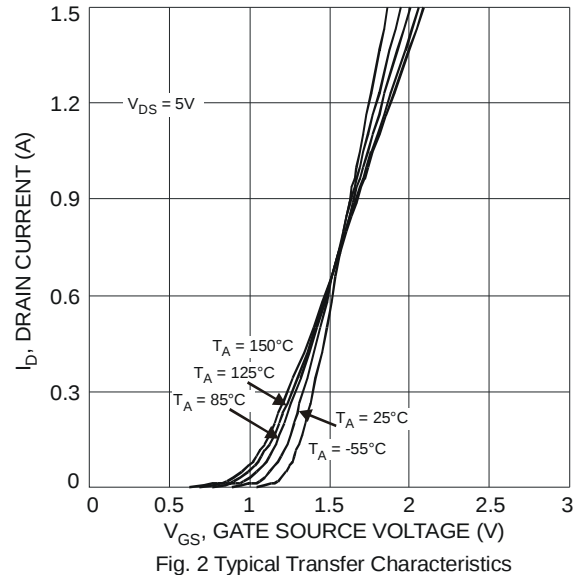
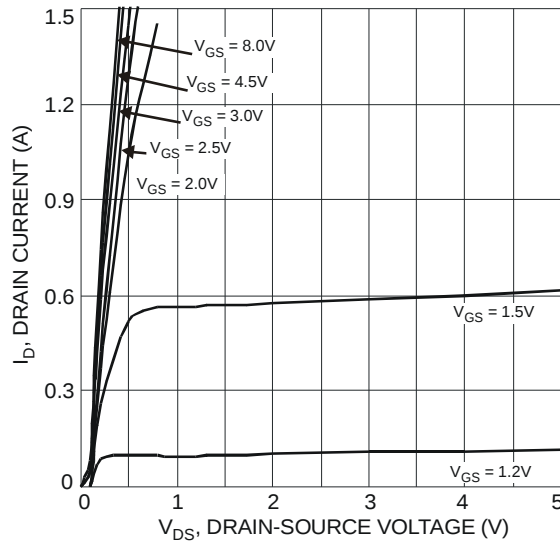
Characteristic			Symbol	Value	Units
Total Power Dissipation (Note 1)			P _D	0.28	W
Thermal Resistance, Junction to Ambient			R _{θJA}	452	°C/W
Operating and Storage Temperature Range			T _J , T _{STG}	-55 to +150	°C

- Notes:
1. Device mounted on FR-4 PCB.
 2. No purposefully added lead.

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)						
Drain-Source Breakdown Voltage	BV _{DSS}	20	-	-	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = 25°C	I _{DSS}	-	-	100	nA	V _{DS} = 20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±1.0	μA	V _{GS} = ±4.5V, V _{DS} = 0V
ON CHARACTERISTICS (Note 4)						
Gate Threshold Voltage	V _{GS(th)}	0.5	-	1.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(on)}	-	0.3	0.4	Ω	V _{GS} = 4.5V, I _D = 600mA
			0.4	0.5		V _{GS} = 2.5V, I _D = 500mA
			0.5	0.7		V _{GS} = 1.8V, I _D = 350mA
Forward Transfer Admittance	Y _{fs}	-	1.4	-	S	V _{DS} = 10V, I _D = 400mA
Diode Forward Voltage (Note 4)	V _{SD}	-	0.7	1.2	V	V _{GS} = 0V, I _S = 150mA
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}	-	60.67	-	pF	V _{DS} = 16V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	9.68	-	pF	
Reverse Transfer Capacitance	C _{rss}	-	5.37	-	pF	
Total Gate Charge	Q _g	-	736.6	-	pC	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 250mA
Gate-Source Charge	Q _{gs}	-	93.6	-	pC	
Gate-Drain Charge	Q _{gd}	-	116.6	-	pC	
Turn-On Delay Time	t _{D(on)}	-	5.1	-	ns	V _{DD} = 10V, V _{GS} = 4.5V, R _L = 47Ω, R _G = 10Ω, I _D = 200mA
Turn-On Rise Time	t _r	-	7.4	-	ns	
Turn-Off Delay Time	t _{D(off)}	-	26.7	-	ns	
Turn-Off Fall Time	t _f	-	12.3	-	ns	

Notes: 4. Short duration pulse test used to minimize self-heating effect.



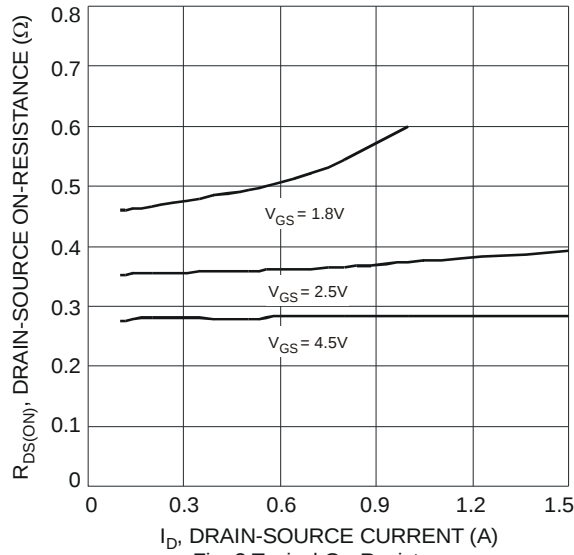


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

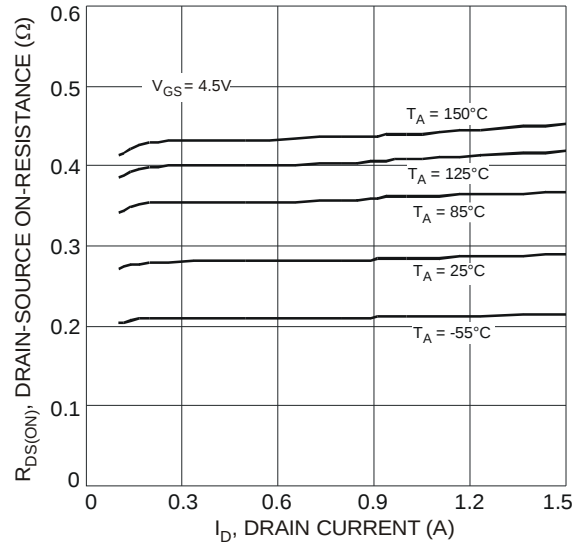


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

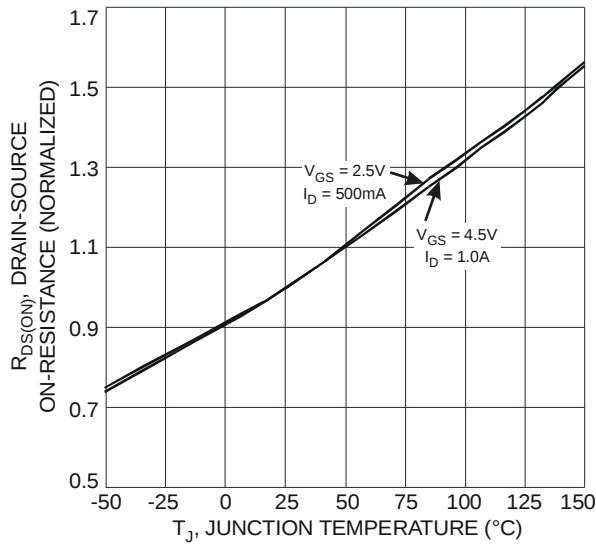


Fig. 5 On-Resistance Variation with Temperature

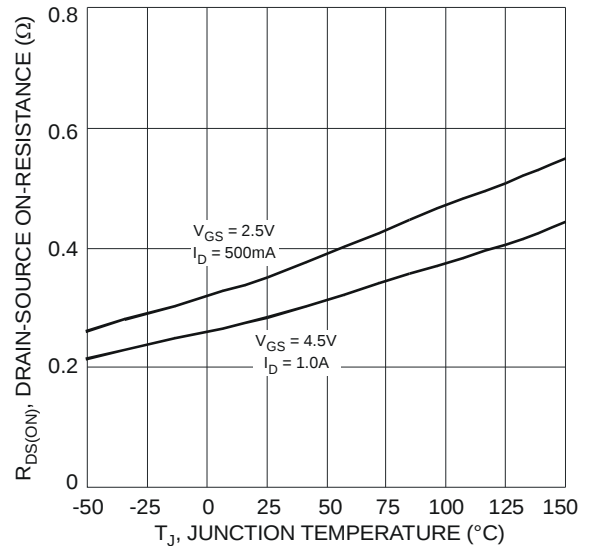


Fig. 6 On-Resistance Variation with Temperature

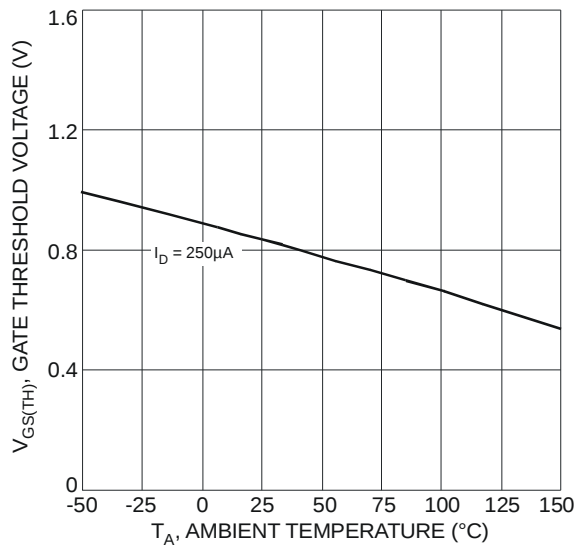


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

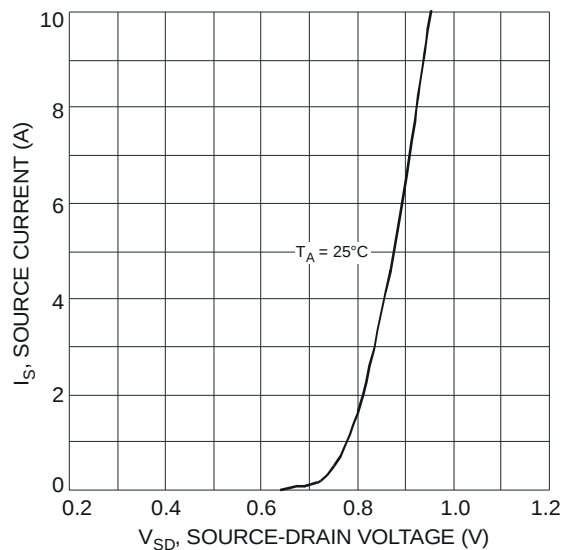
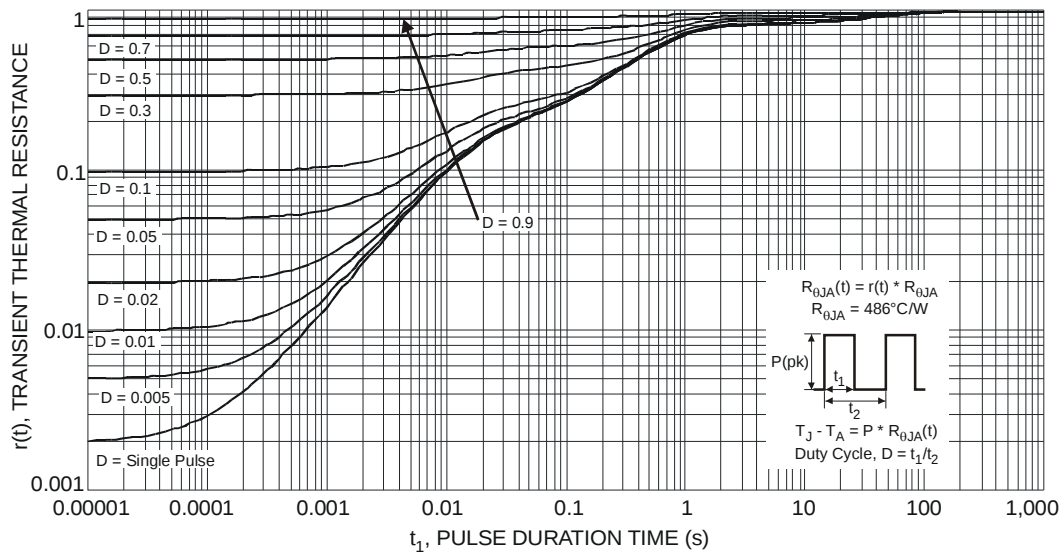
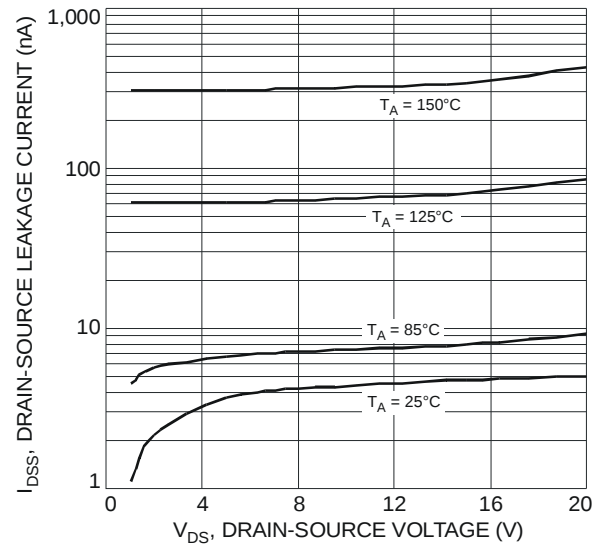
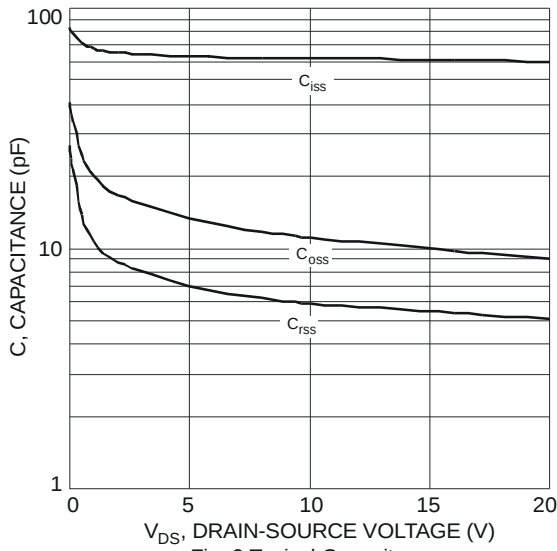
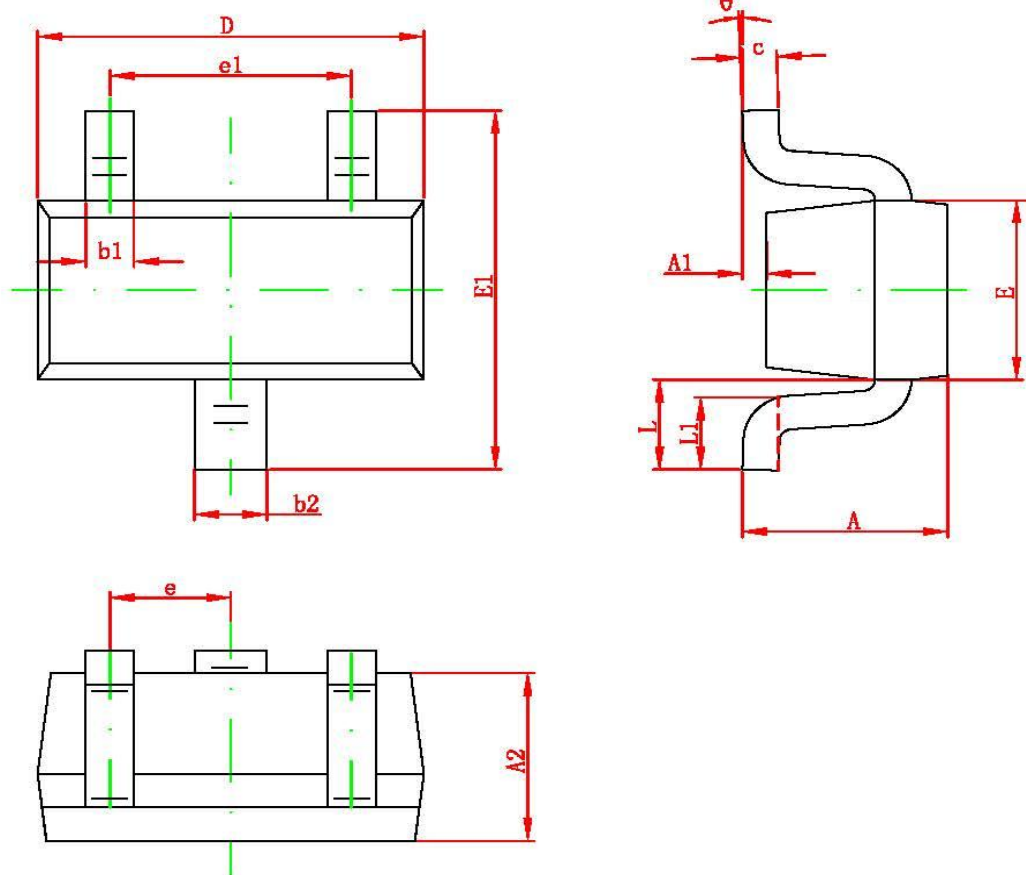


Fig. 8 Diode Forward Voltage vs. Current



SOT-523 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°