



FW513

MOSFET : N-Channel Silicon MOSFET
 FRD : Ultrahigh-Speed Switching Diode

General-Purpose Switching Device Applications

Features

- FET $R_{DS(on)}=5.8\Omega$ (typ.), 10V drive
- FRD $V_F=1.1V$ (typ.), $t_{rr}=40ns$ (typ.)
- Nch MOSFET+FRD

Specifications

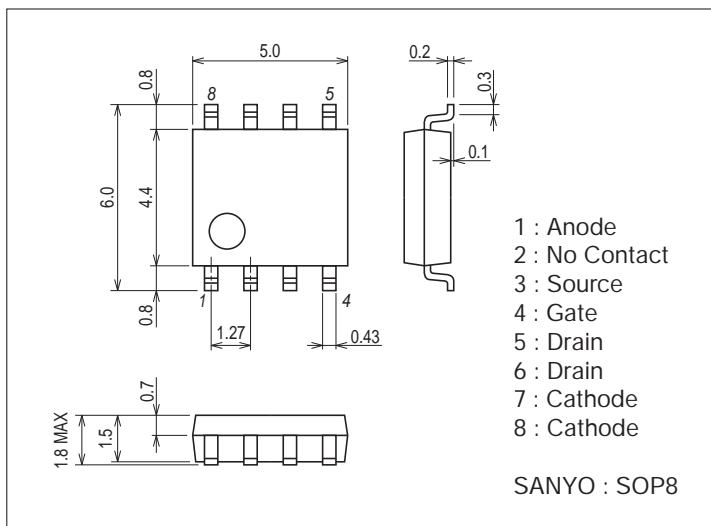
Absolute Maximum Ratings at $T_a=25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V_{DSS}		600	V
Gate-to-Source Voltage	V_{GSS}		± 30	V
Drain Current (DC)	I_D		0.35	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	1.4	A
Allowable Power Dissipation	PD	When mounted on ceramic substrate (1000mm ² ×0.8mm) 1unit	1.5	W
Channel Temperature	T_{ch}		150	°C
Storage Temperature	T_{stg}		-55 to +150	°C

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Package Dimensions

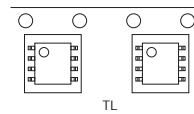
unit : mm (typ)
 7005A-009



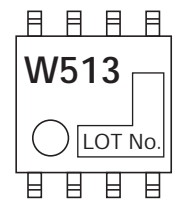
Product & Package Information

- Package : SOP8
- JEITA, JEDEC : SC-87, SOT-96
- Minimum Packing Quantity : 1,000 pcs./reel

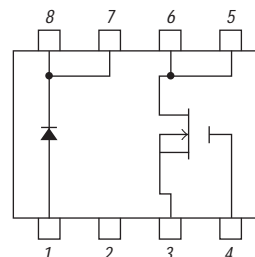
Packing Type : TL



Marking



Electrical Connection



FW513

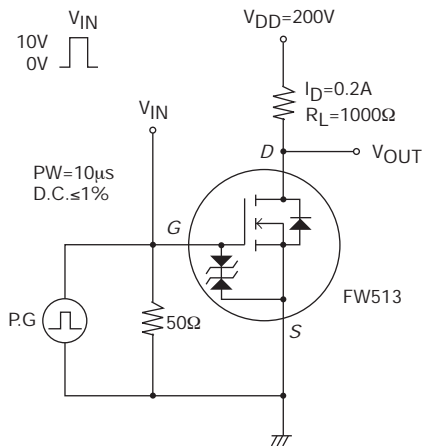
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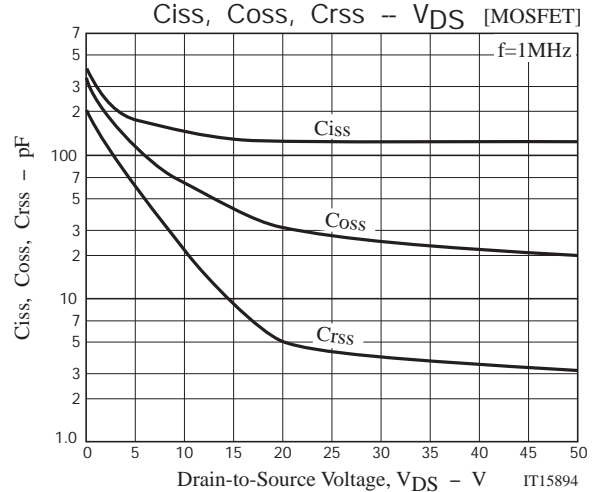
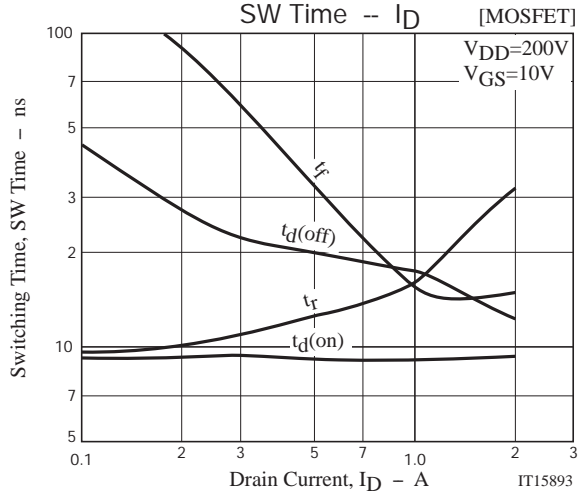
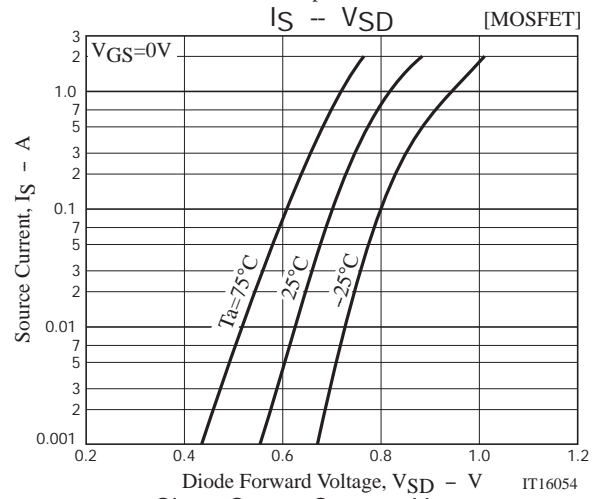
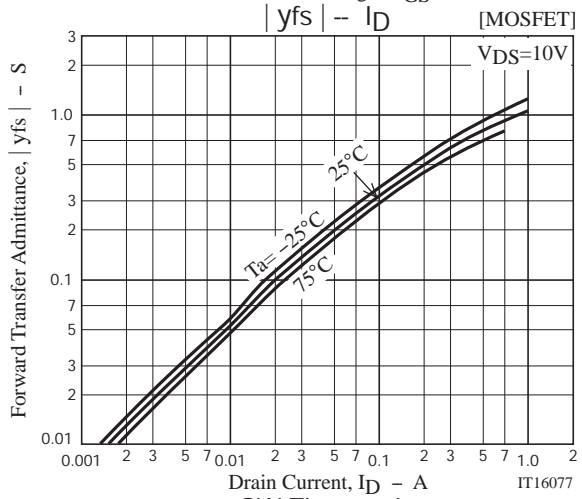
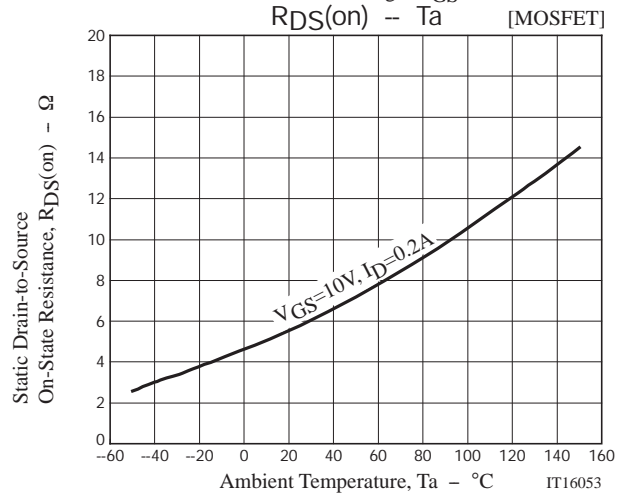
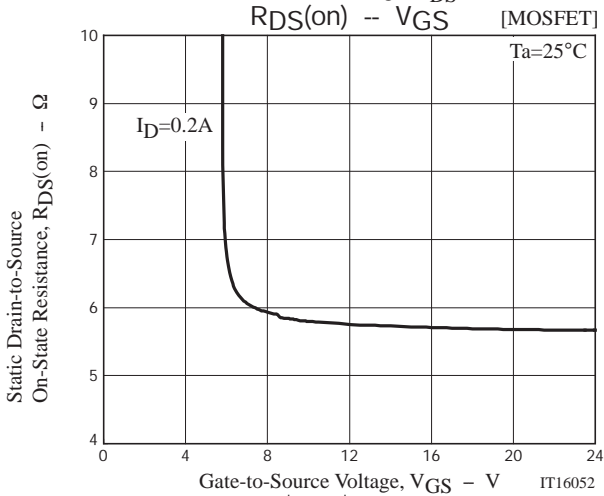
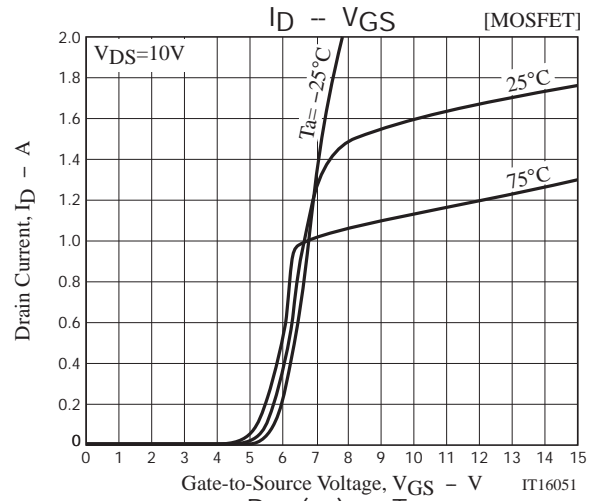
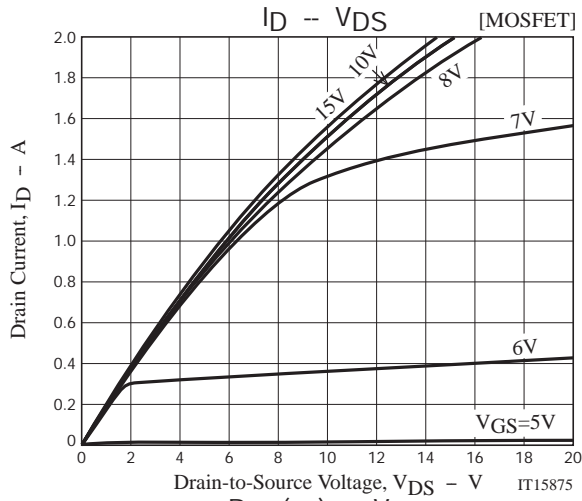
Parameter	Symbol	Conditions	Ratings	Unit
[FRD]				
Repetitive Peak Reverse Voltage	V_{RRM}		600	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}		600	V
Average Output Current	I_O		1	A
Surge Forward Current	I_{FSM}	Sine wave, 10ms	4	A
Junction Temperature	T_j		150	°C
Storage Temperature	T_{stg}		-55 to +150	°C

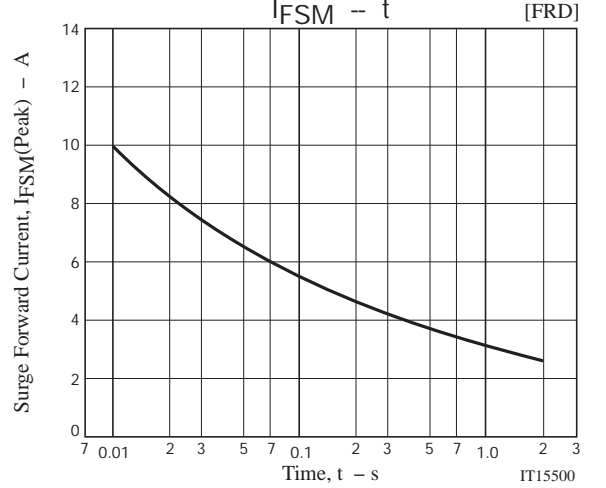
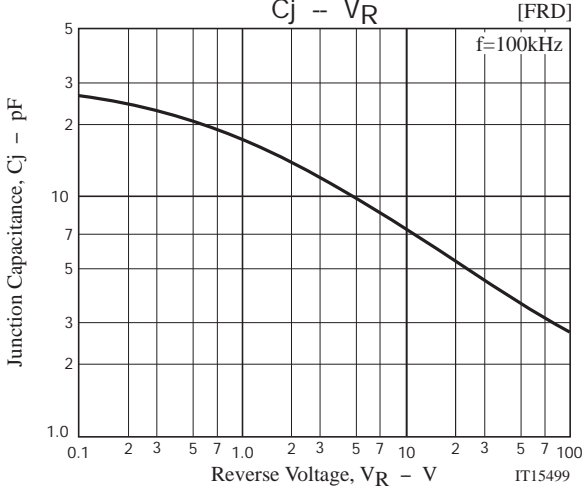
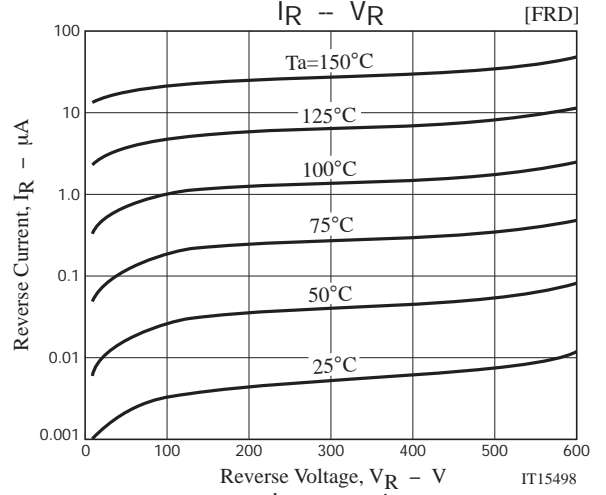
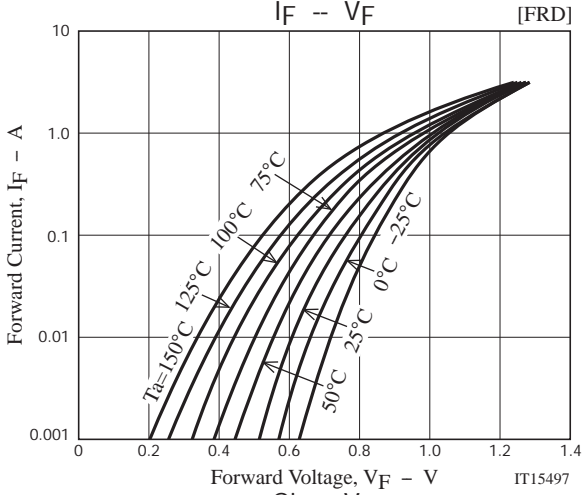
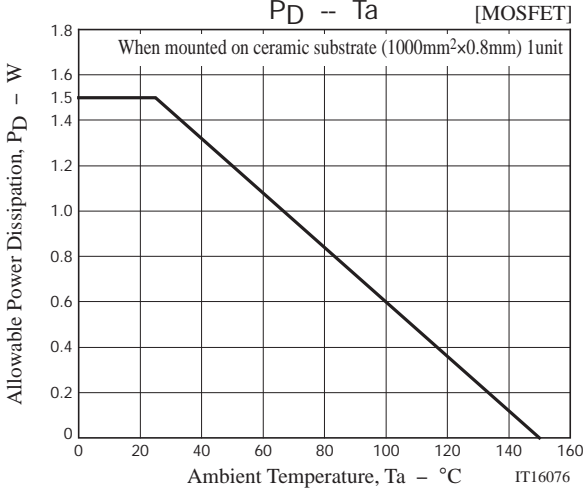
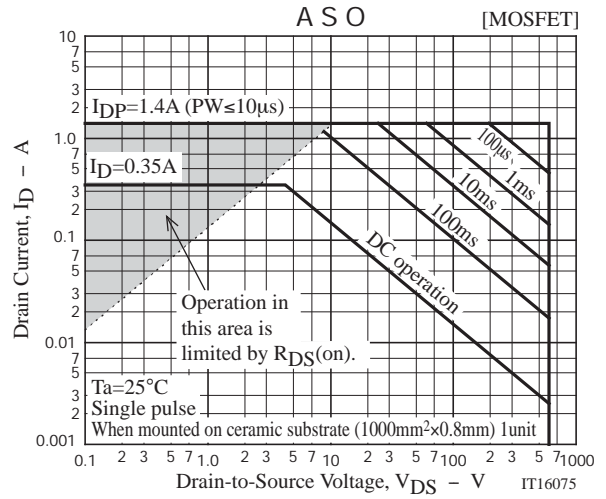
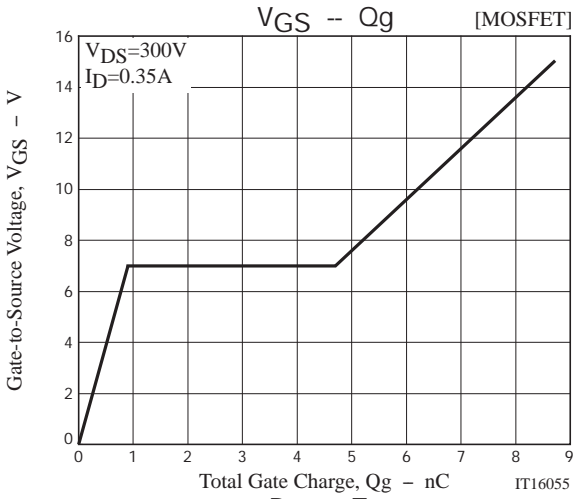
Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10\text{mA}, V_{GS}=0\text{V}$	600			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=480\text{V}, V_{GS}=0\text{V}$			1	mA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 24\text{V}, V_{DS}=0\text{V}$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}, I_D=1\text{mA}$	3		5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}, I_D=0.2\text{A}$		0.48		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=0.2\text{A}, V_{GS}=10\text{V}$		5.8	7.6	Ω
Input Capacitance	C_{iss}	$V_{DS}=30\text{V}, f=1\text{MHz}$		130		pF
Output Capacitance	C_{oss}	$V_{DS}=30\text{V}, f=1\text{MHz}$		25		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=30\text{V}, f=1\text{MHz}$		4.0		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		9.1		ns
Rise Time	t_r	See specified Test Circuit.		15		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		18		ns
Fall Time	t_f	See specified Test Circuit.		19		ns
Total Gate Charge	Q_g	$V_{DS}=300\text{V}, V_{GS}=10\text{V}, I_D=0.35\text{A}$		6.2		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=300\text{V}, V_{GS}=10\text{V}, I_D=0.35\text{A}$		0.9		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=300\text{V}, V_{GS}=10\text{V}, I_D=0.35\text{A}$		3.8		nC
Diode Forward Voltage	V_{SD}	$I_S=0.35\text{A}, V_{GS}=0\text{V}$		0.76	1.2	V
[FRD]						
Reverse Voltage	V_R	$I_R=1\text{mA}$	600			V
Forward Voltage	V_F	$I_F=1\text{A}$		1.1	1.3	V
Reverse Current	I_R	$V_R=600\text{V}$			10	μA
Reverse Recovery Time	t_{rr1}	$I_F=1\text{A}, di/dt=100\text{A}/\mu\text{s}$		40	50	ns
	t_{rr2}	$I_F=0.5\text{A}, I_R=1\text{A}$		16		ns
Thermal Resistance	$R_{th(j-c)}$	Junction - Case		6		°C / W

Switching Time Test Circuit [MOSFET]







Note on usage : Since the FW513 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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