

N-Channel MOSFET

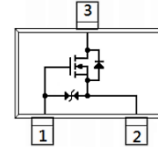
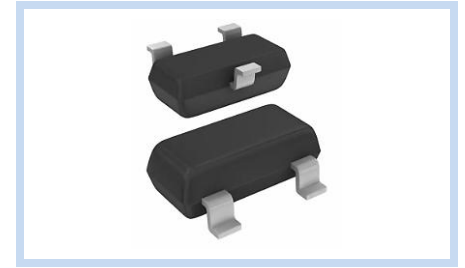
30V 1.4A SOT-323 ESD

MFT3N1A4S323E

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FEATURE

- $R_{DS(ON)} < 132m\Omega$ at $V_{GS}=10V$, $I_D=1.4A$
- $R_{DS(ON)} < 144m\Omega$ at $V_{GS}=4.5V$, $I_D=1.0A$
- $R_{DS(ON)} < 185m\Omega$ at $V_{GS}=2.5V$, $I_D=0.5A$
- ESD Protected
- Application: Battery Operated Systems, Solid-State Relays, Displays, Lamps, Solenoids, Memories, etc

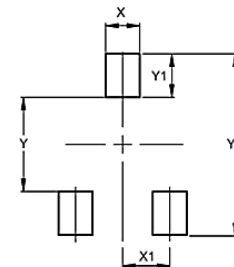
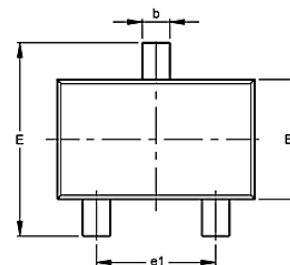
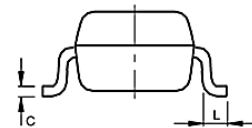
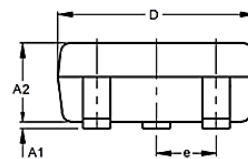


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current – Continuous	I_D	1.4	A
Drain Current – Pulsed	I_{DM}	6	A
Pulse Width $\leq 100\mu s$			
Power Dissipation	P_D	0.4	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	312	$^{\circ}C/W$
Operating Junction and Storage Temperature	T_J, T_{stg}	-55 to 150	$^{\circ}C$

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	0.00	0.10
A2	0.80	1.10
b	0.20	0.40
c	0.05	0.25
D	1.80	2.20
e	0.65 TYP	
e1	1.20	1.40
E	2.00	2.40
E1	1.15	1.35
L	0.10	--
X	0.80	
X1	0.65	
Y	0.80	
Y1	0.80	
Y2	2.40	



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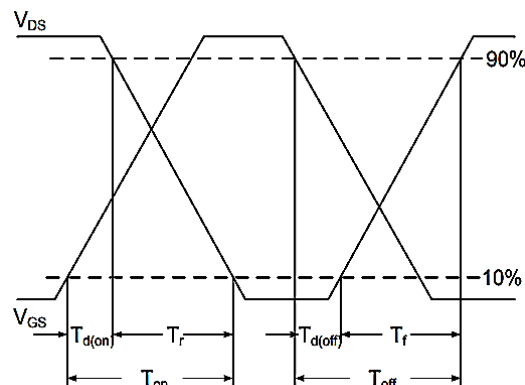
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	I _D =250μA	BV _{DSS}	30	--	--	V
Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	V _{GS(th)}	0.6	--	1.5	V
Gate Source Leakage Current	V _{GS} =±12V	I _{GSS}	--	--	±20	μA
Zero Gate Voltage Drain Current	V _{DS} =30V	I _{DSS}	--	--	1	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	V _{GS} =10V, I _D =1.4A	R _{DS(ON)}	--	--	132	mΩ
	V _{GS} =4.5V, I _D =1.0A		--	--	144	
	V _{GS} =2.5V, I _D =0.5A		--	--	185	
Forward Transconductance	V _{DS} =10V, I _D =1.4A	g _{FS}	--	2.4	--	S
Dynamic Characteristics	Conditions	Symbol	--	Typ.	Max	Unit
Input Capacitance	V _{DS} =15V, V _{GS} =0V, F=1MHz	C _{iss}	--	180	--	pF
Output Capacitance		C _{oss}	--	18	--	
Reverse Transfer Capacitance		C _{rss}	--	16	--	
Turn-On Delay Time	V _{DS} =15V, I _D =1.5A, V _{GS} =4.5V, R _G = 4.5Ω	T _{d(on)}	--	4.1	--	nS
Rise Time		T _r	--	4.2	--	
Turn-Off Delay Time		T _{d(off)}	--	17.0	--	
Fall Time		T _f	--	5.3	--	
Total Gate Charge	V _{DS} =15V, V _{GS} =2.5V, I _D =1.5A	Q _g	--	1.3	--	nC
			--	2.5	--	
Gate-Source Charge	V _{DS} =15V, V _{GS} =4.5V, I _D =1.5A	Q _{gs}	--	0.8	--	
Gate-Drain Charge		Q _{gd}	--	0.5	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Voltage	I _S =1.1A	V _{SD}	--	--	1.2	V
Diode Continuous Source Current	--	I _S	--	--	1.4	A
Reverse Recovery Time	I _S =1.5A, dI/dt=100A/μs	t _{rr}	--	5.6	--	nS
Reverse Recovery Charge		Q _{rr}	--	1.8	--	nC

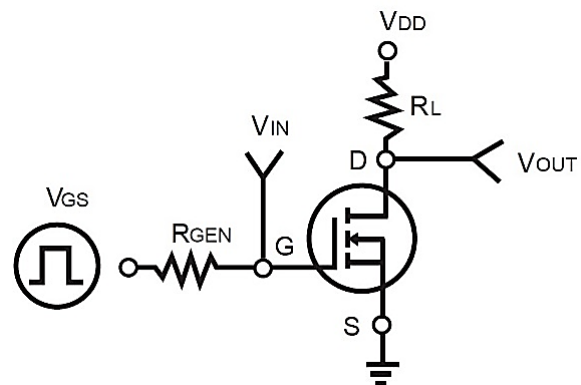
Note:

- $T_A=25^\circ C$ unless otherwise noted.
- Pulse width $\leq 100\mu s$, duty cycle $\leq 2\%$, Repetitive rating, pulsed width limited by junction temperature $T_{J(MAX)}=150^\circ C$
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

Switching Time Waveform



Switching Test Circuit



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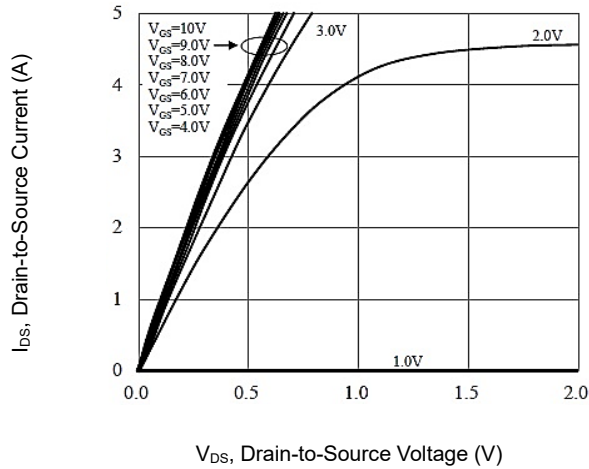
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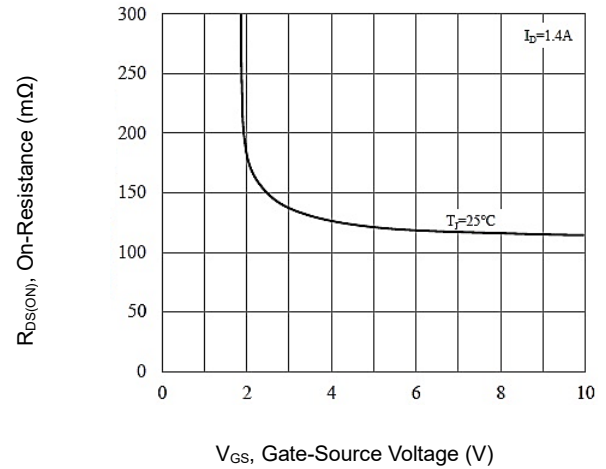
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CHARACTERISTIC CURVES

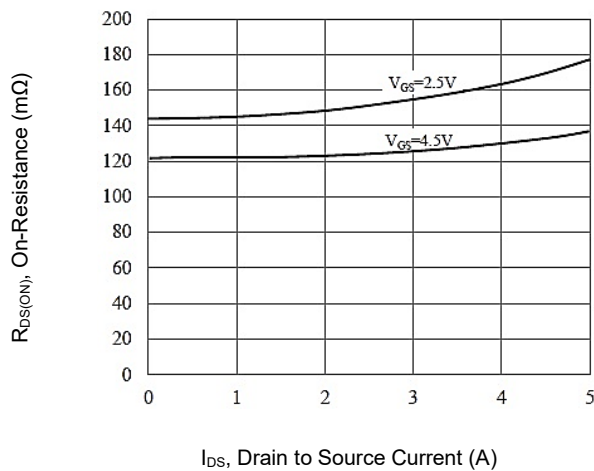
Output Characteristics



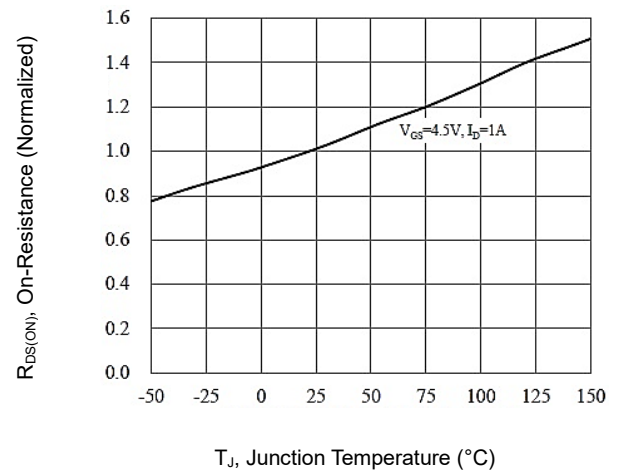
On-Resistance vs. Gate-to-Source Voltage



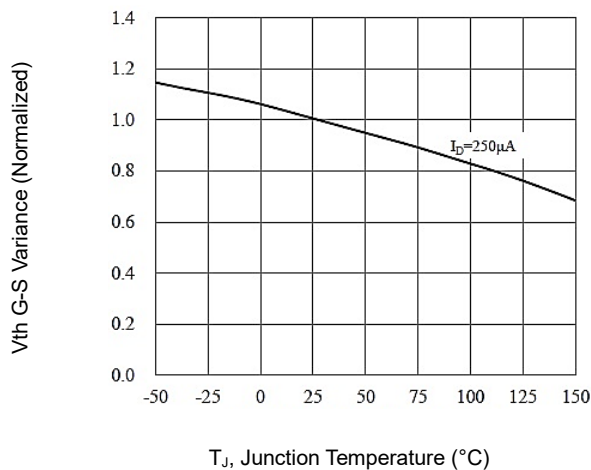
On-Resistance vs. Drain Current



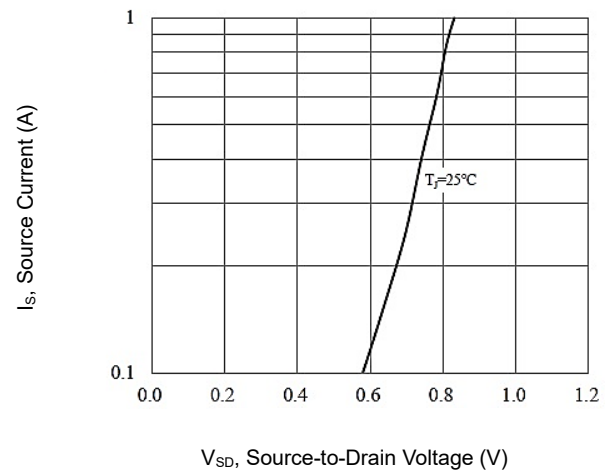
On-Resistance vs. Junction Temperature



Threshold Voltage Variance vs. Temperature



Body Diode Characteristics



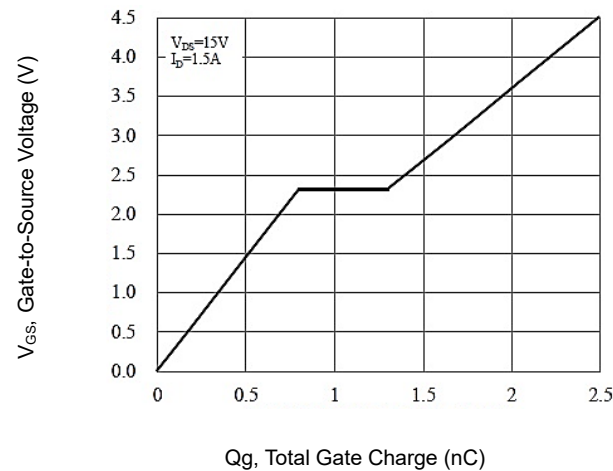
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CHARACTERISTIC CURVES

Gate Charge Characteristics



Capacitance vs. Drain-Source Voltage

