

N-Channel MOSFET

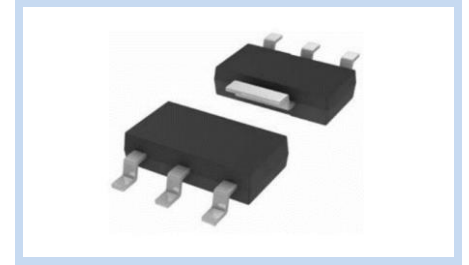
100V 3.5A 3W SOT-223

MFT10N3A5S223

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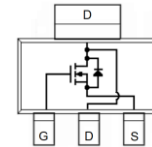
FEATURE

- $R_{DS(ON)} \leq 120m\Omega$, $V_{GS}=10V$
- $R_{DS(ON)} \leq 140m\Omega$, $V_{GS}=5V$
- High Density Cell Design for Extremely Low $R_{DS(ON)}$
- Applications: DC/DC Converters, Switched Mode Power Supplies, Audio Amplifier, DC Motor Control



MECHANICAL DATA

- Case: SOT-223 Package
- Terminals: Solderable per MIL-STD-750, Method 2026



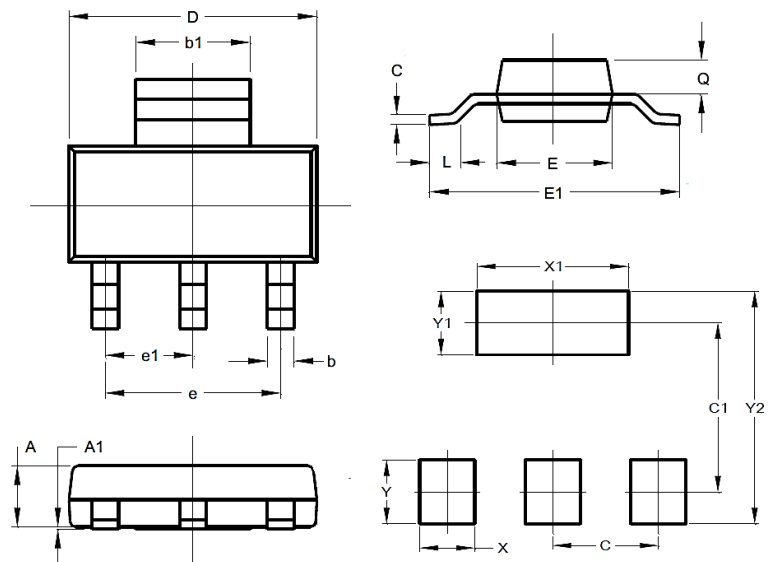
MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	3.5	A
Drain Current – Pulsed	I_{DM}	14	A
Power Dissipation	P_D	3	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	42	$^{\circ}C/W$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}C$

DIMENSIONS

SOT-223	Min. (mm)	Max. (mm)
A	1.50	1.70
A1	0.02	0.10
b	0.67	0.80
b1	2.95	3.20
c	0.24	0.35
C	2.30	
C1	6.30	
D	6.30	6.85
E	3.30	3.80
E1	6.70	7.30
e	4.60 TYP	
e1	2.30 TYP	
L	0.90	--
Q	0.70	1.10
X	1.20	
X1	3.50	
Y	1.60	
Y1	1.80	
Y2	8.00	

Note: 1: Gate, 2: Drain, 3: Source,



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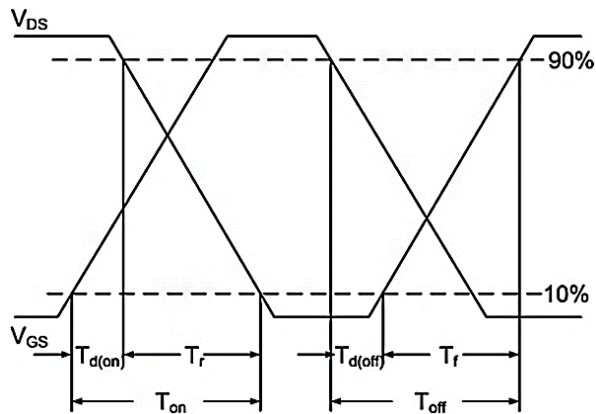
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	100	--	--	V
Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=2A$	$R_{DS(ON)}$	--	80	120	m Ω
	$V_{GS}=5V, I_D=1.5A$		--	100	140	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	--	3.0	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=80V, V_{GS}=4.5V, I_D=1A$	Q_g	--	10	--	nC
Gate-Source Charge		Q_{gs}	--	2.2	--	
Gate-Drain Charge		Q_{gd}	--	5.4	--	
Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_G=10\Omega, I_D=1A$	$T_{d(on)}$	--	15	--	ns
Rise Time		T_r	--	4	--	
Turn-Off Delay Time		$T_{d(off)}$	--	37	--	
Fall Time		T_f	--	4	--	
Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	C_{iss}	--	905	--	pF
Output Capacitance		C_{oss}	--	60	--	
Reverse Transfer Capacitance		C_{rss}	--	45	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	2.5	A
Diode Forward Voltage	$V_{GS}=0V, I_S=2A$	V_{SD}	--	--	1.2	V

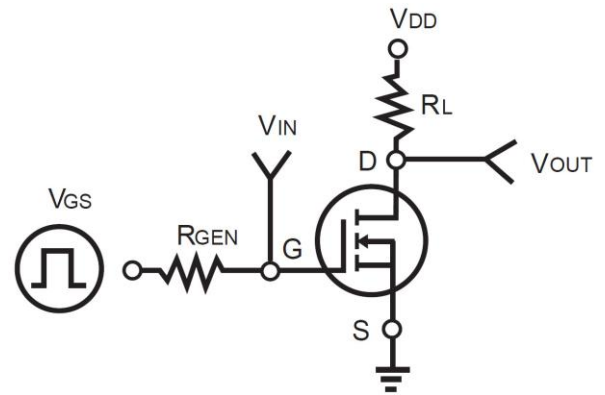
Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Switching Time Waveform



Switching Test Circuit



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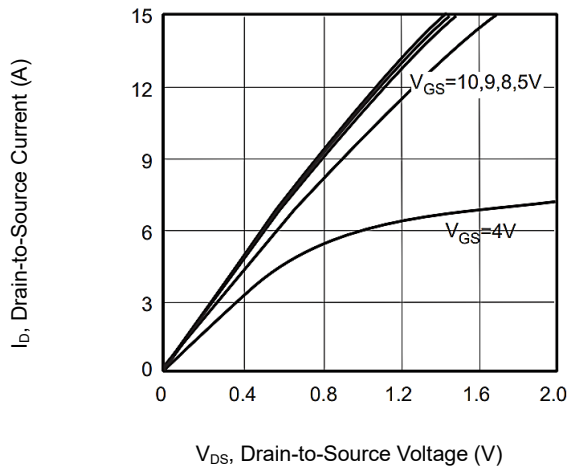
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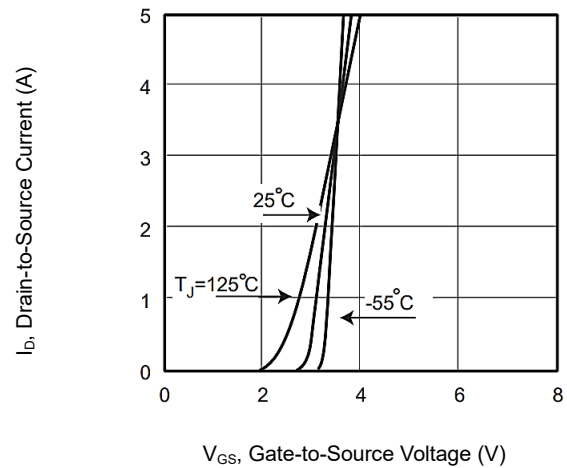
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CHARACTERISTIC CURVES

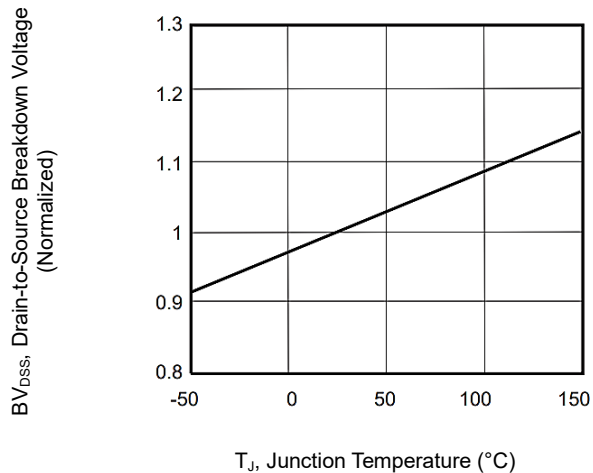
Output Characteristics



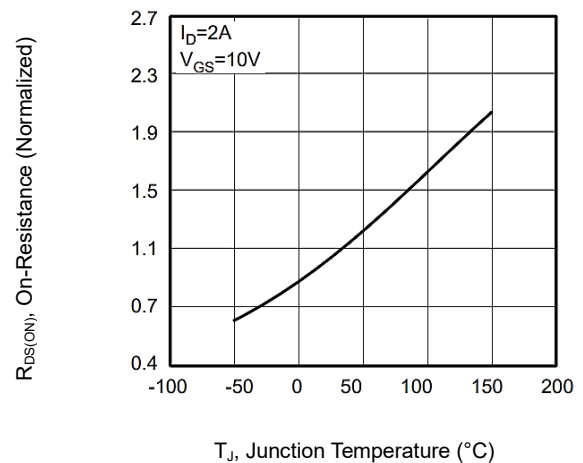
Transfer Characteristics



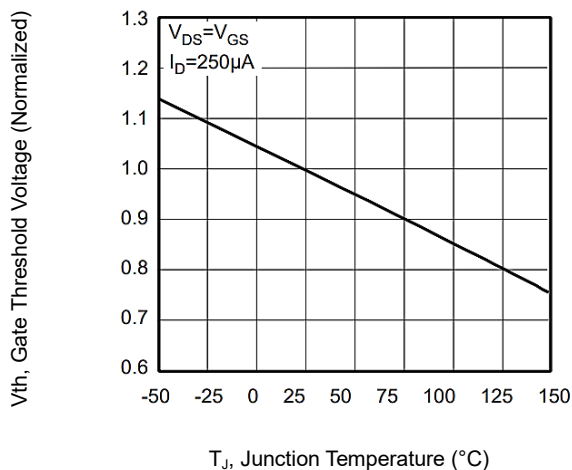
Breakdown Voltage vs. Temperature



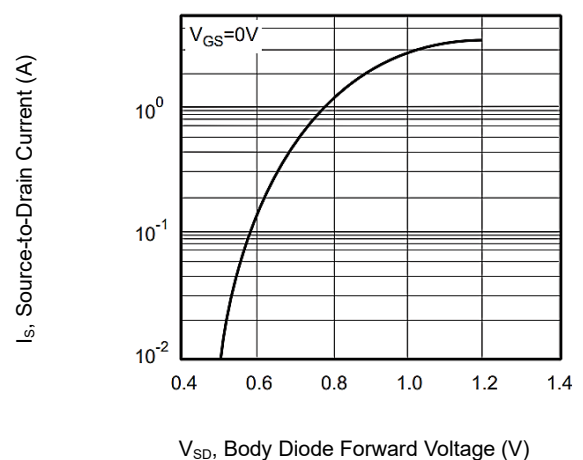
Normalized On-Resistance vs. Temperature



Threshold Voltage vs. Temperature



Body Diode Characteristics



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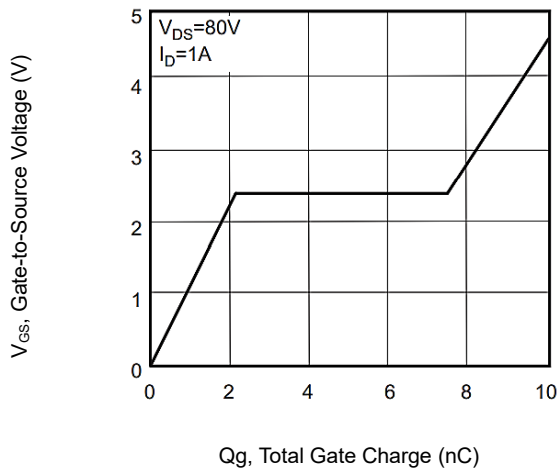
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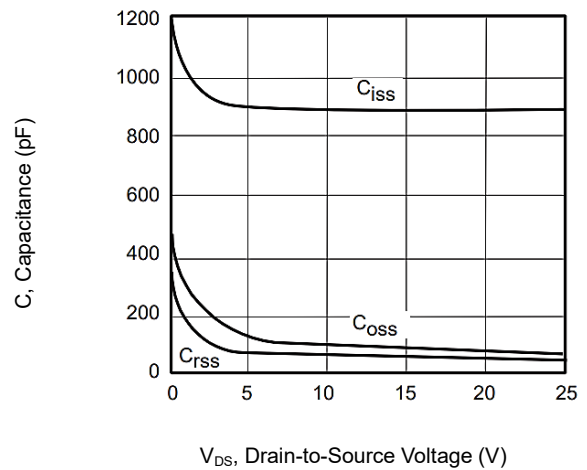
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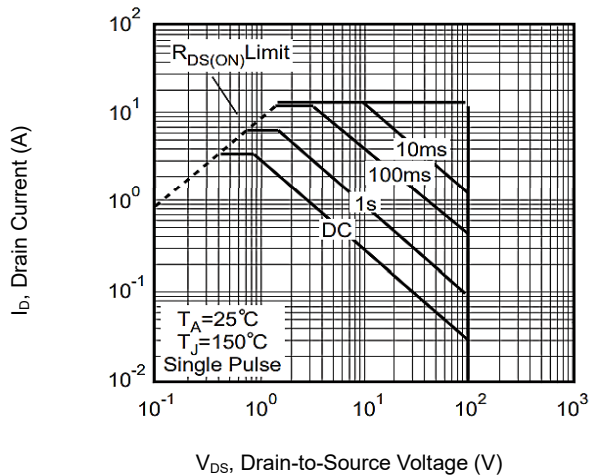
Gate-Charge Characteristics



Capacitance



Maximum Safe Operating Area



Normalized Transient Thermal Impedance Curve

