

P-Channel MOSFET

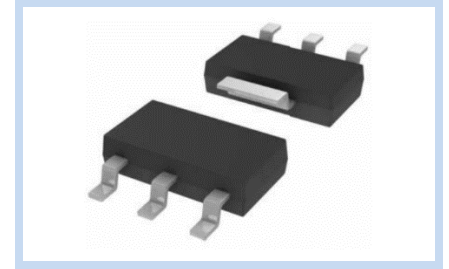
-60V -9A 12.5W SOT-223

MFT6P9A0S223

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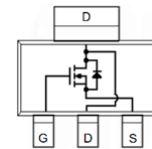
FEATURE

- $R_{DS(ON)} < 90m\Omega$, $V_{GS} = -10V$, $I_D = -5.7A$
- $R_{DS(ON)} < 110m\Omega$, $V_{GS} = -5V$, $I_D = -4.4A$
- Fast Switching Characteristics
- Rugged Construction Design
- Application: Power Management in Note book, Battery Powered System



MECHANICAL DATA

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

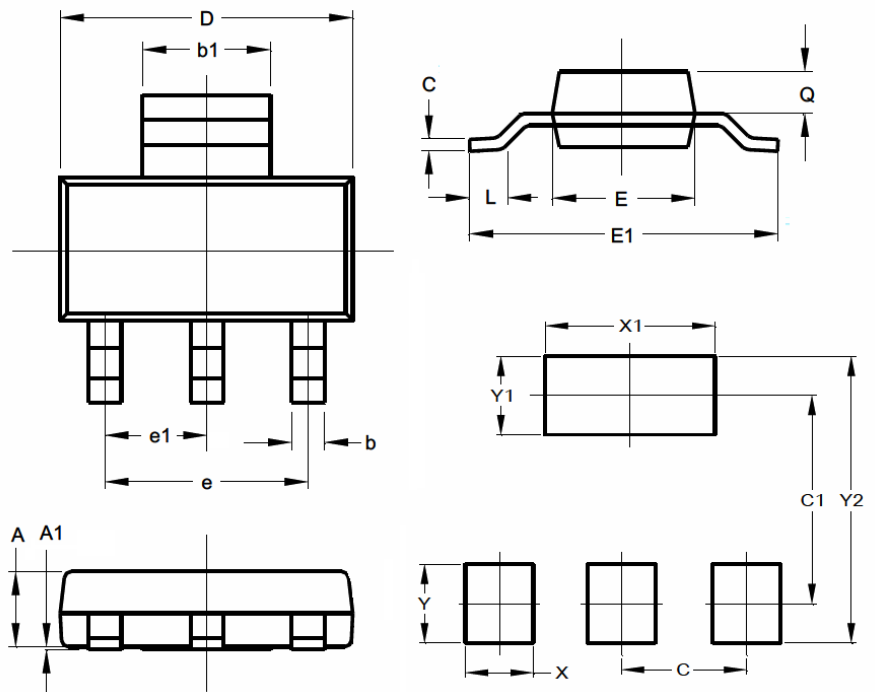


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	V_{DS}	-60	V	
Gate-Source Voltage	V_{GS}	± 20	V	
Drain Current – Continuous	I_D	$T_C = 25^\circ C$	-9	A
		$T_C = 100^\circ C$	-6	A
Drain Current – Pulsed	I_{DM}	-35	A	
Single-Pulse Avalanche Current	I_{AS}	-17	A	
Single-Pulse Avalanche Energy	E_{AS}	14	mJ	
Power Dissipation	P_D	12.5	W	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ C$	
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	50	$^\circ C / W$	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	10	$^\circ C / W$	

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	1.50	1.80
A1	0.02	0.10
b	0.60	0.80
b1	2.90	3.10
C	0.25	0.35
D	6.30	6.70
E	3.30	3.70
E1	6.70	7.30
e	4.60	
e1	2.30	
L	0.75	-
Q	0.84	0.94
X	1.20	
X1	3.30	
Y	1.60	
Y1	1.60	
Y2	8.00	
c	2.30	
c1	6.40	



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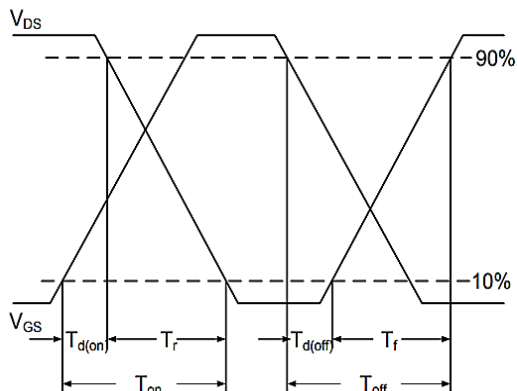
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	BV_{DSS}	-60	--	--	V
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.2	--	-2.5	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	I_{GSS}	--	--	± 0.1	μA
Zero Gate Voltage Drain Current	$V_{DS}=-48V, V_{GS}=0V$	I_{DSS}	--	--	-1.0	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-5.7A$	$R_{DS(on)}$	--	70	90	m Ω
	$V_{GS}=-4.5V, I_D=-4.4A$		--	--	110	m Ω
Dynamic Characteristics	Conditions	Symbol	--	Typ.	Max	Unit
Input Capacitance	$V_{DS}=-30V, V_{GS}=0V$ $F=1.0MHz$	C_{iss}	--	950	--	pF
Output Capacitance		C_{oss}	--	51	--	pF
Reverse Transfer Capacitance		C_{rss}	--	19	--	pF
Turn-On Delay Time	$V_{DS}=-30V, I_D=-5.7A,$ $V_{GS}=-10V, R_G=4.7\Omega$	$T_{d(on)}$	--	9	--	nS
Rise Time		T_r	--	11	--	nS
Turn-Off Delay Time		$T_{d(off)}$	--	14	--	nS
Fall Time		T_f	--	3	--	nS
Total Gate Charge		$V_{DS}=-30V, V_{GS}=-4.5V, I_D=-4A$	Q_g	--	7	--
Gate-Source Charge	$V_{DS}=-30V, V_{GS}=-10V,$ $I_D=-4A$	--		19	--	nC
Gate-Drain Charge		Q_{gd}	--	3	--	nC
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Voltage	$I_S=-1A, V_{GS}=0V$	V_{SD}	--	--	-1.2	V
Forward Transconductance	$V_{DS}=-25V, I_D=-100mA$	g_{FS}	--	5	--	S
Diode Pulse Current	--	I_{SM}	--	--	-35	A
Reverse Recovery Time	$I_S=-5.7A, di/dt=100A/\mu s$	t_{rr}	--	13	--	nS
Reverse Recovery Charge		Q_{rr}	--	9	--	nC

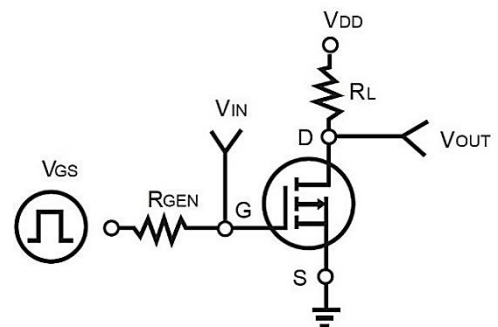
Note:

- $T_A = 25^\circ C$ Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability
- Pulse width < 100us, Duty cycle < 2%, Repetitive rating, pulse width limited by junction temperature $T_J(MAX)=150^\circ C$
- $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins mounted on a PCB described in Note 4&5.
- Limited by $T_J(MAX)$, starting $T_J = 25^\circ C$, $L = 0.1mH$, $R_g = 25\Omega$, $I_{AS} = -17A$, $V_{GS} = -10V$.
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1 inch square copper plate in still air.

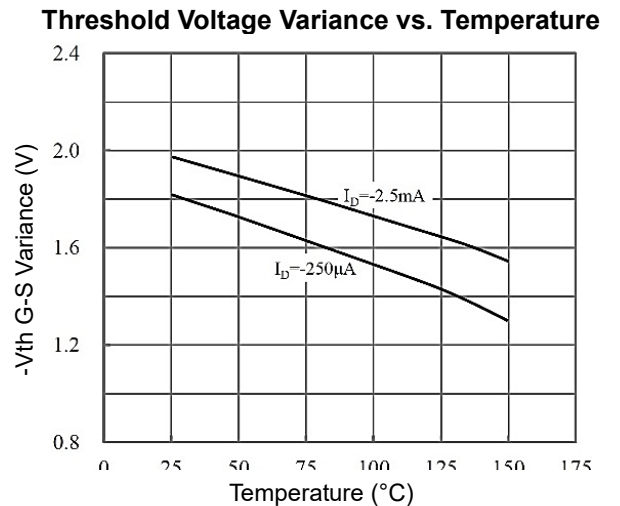
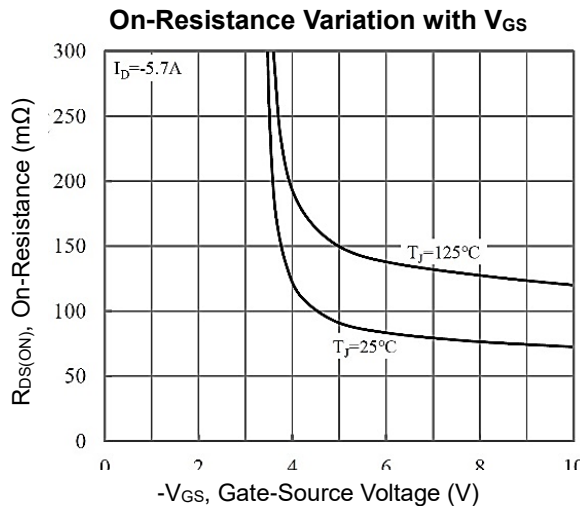
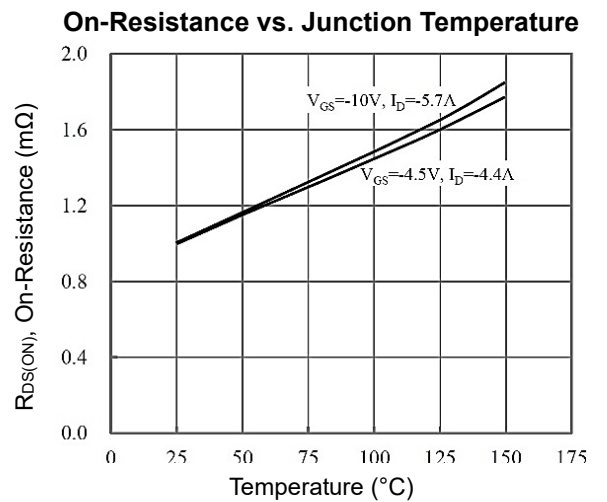
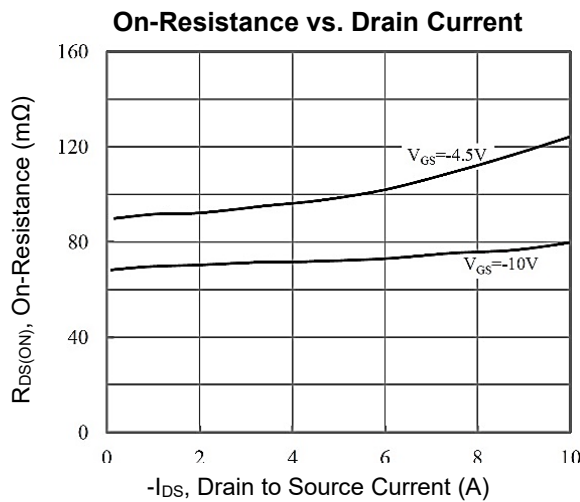
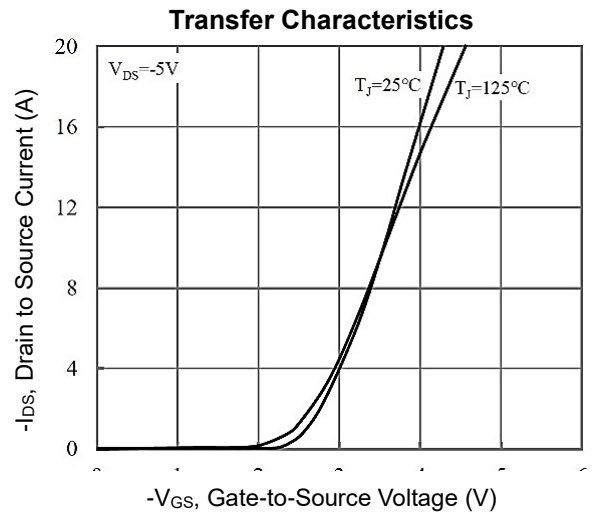
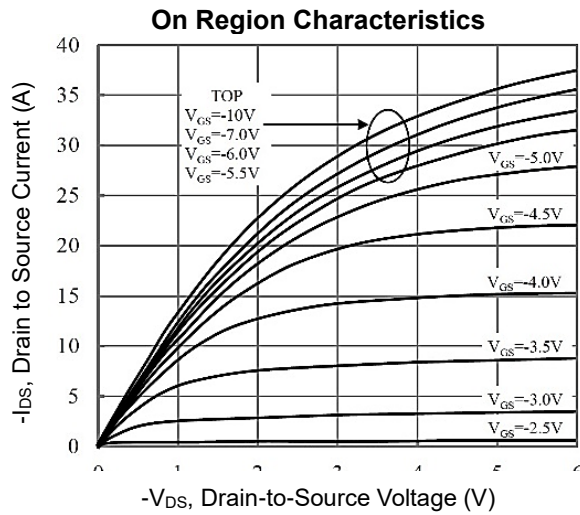
Switching Time Waveform



Switching Test Circuit



CHARACTERISTIC CURVES



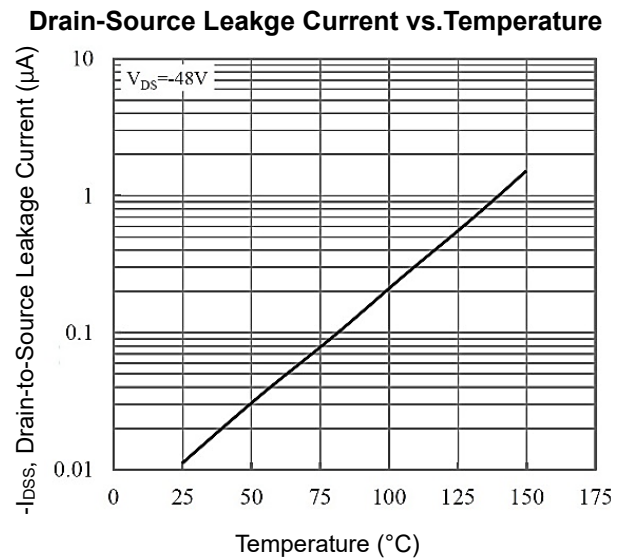
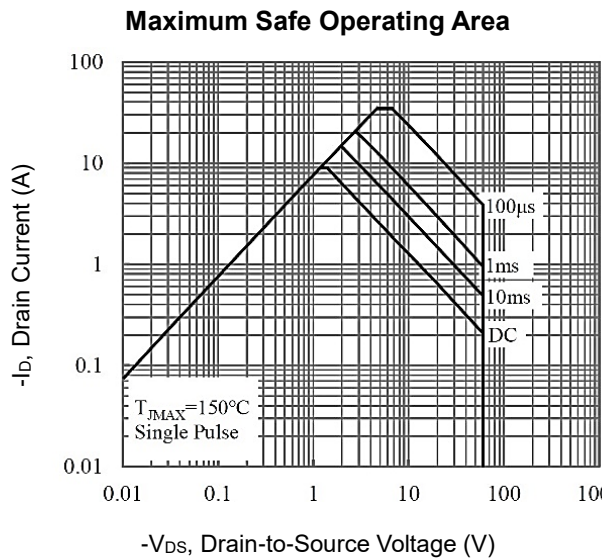
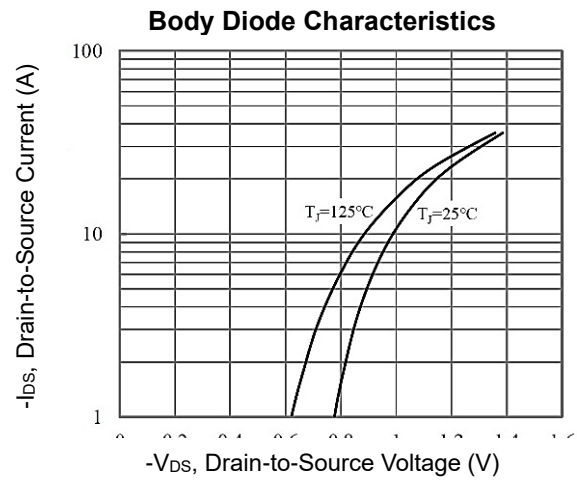
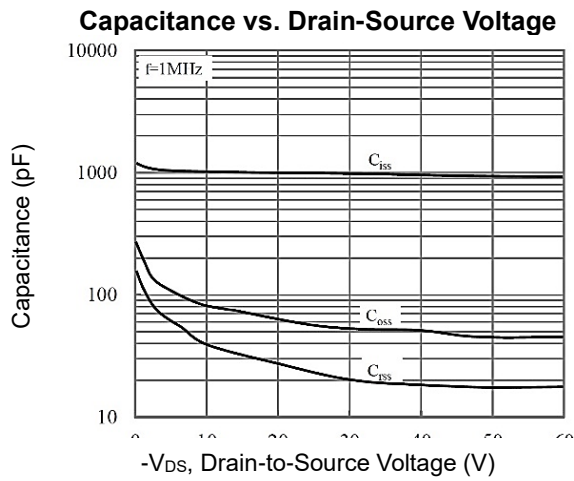
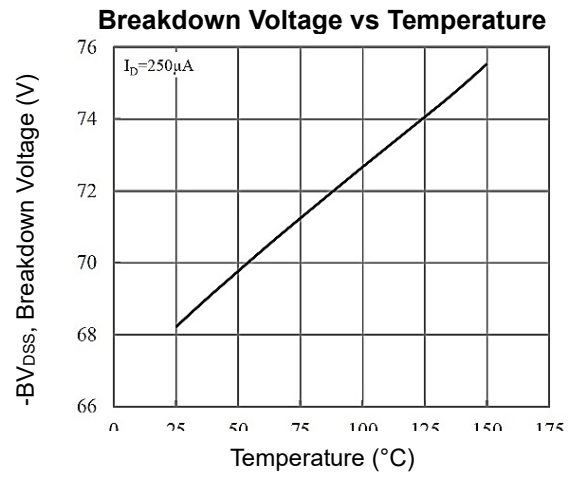
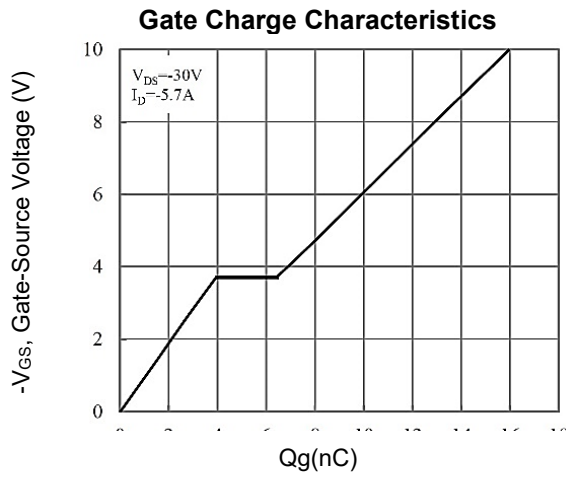
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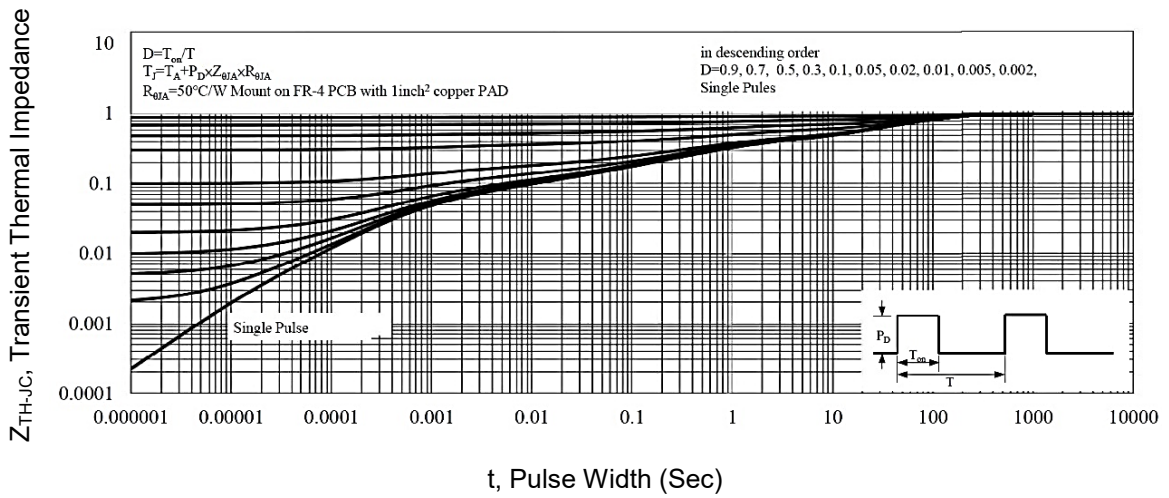
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Normalized Transient Thermal Impedance from Junction to Ambient vs Pulse Width



Normalized Transient Thermal Impedance from Junction to Case vs Pulse Width

