

P-Channel MOSFET

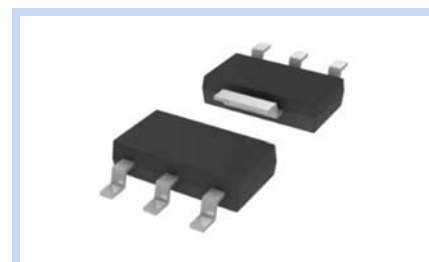
60V 4A 3.1W SOT-223

MFT6P4S223

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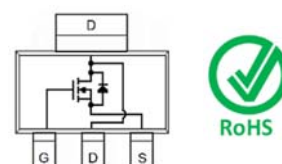
FEATURE

- $R_{DS(ON)} < 110m\Omega$, $V_{GS} = -10V$, $I_D = -4A$
- $R_{DS(ON)} < 130m\Omega$, $V_{GS} = -4.5V$, $I_D = -2A$
- High switching speed
- Improved dv/dt capability
- Low Gate Charge and Low Reverse Transfer Capacitance



MECHANICAL DATA

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

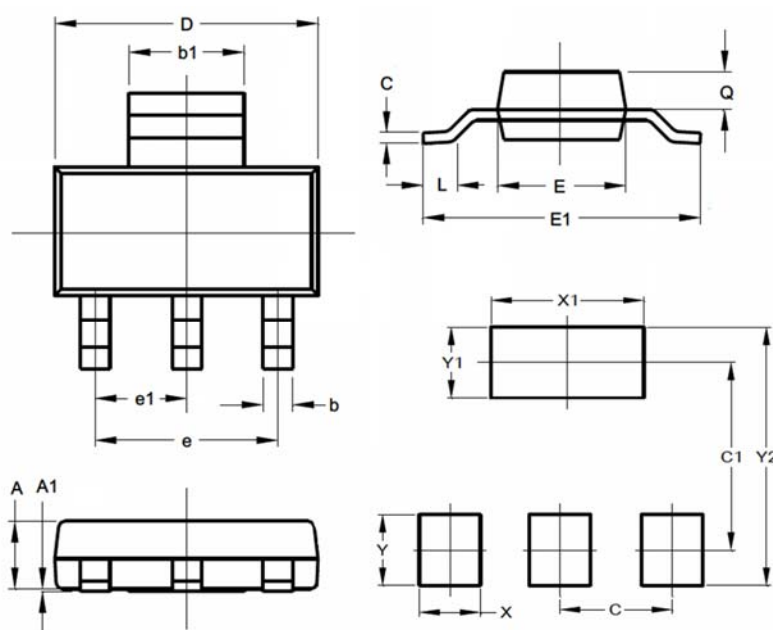


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$T_A = 25^\circ C$	I_D	-4	A
	$T_A = 70^\circ C$		-3.2	A
Drain Current – Pulsed	$T_A = 25^\circ C$	I_{DM}	-16	A
Single Pulse Avalanche Energy		E_{AS}	12.8	mJ
Power Dissipation	$T_A = 25^\circ C$	P_D	3.1	W
	$T_A = 70^\circ C$		2	W
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	40.3	$^\circ C/W$
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 ~ 150	$^\circ C$

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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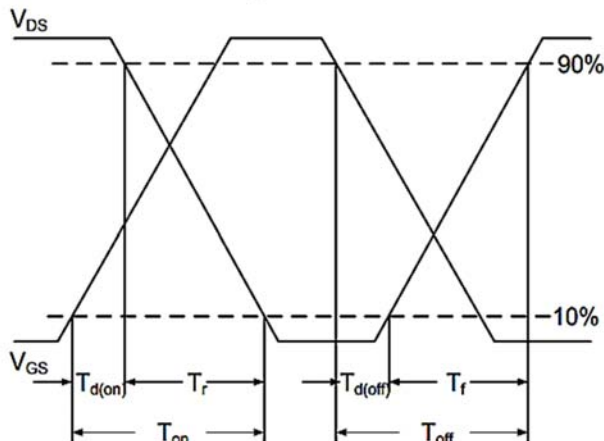
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	BV_{DSS}	-60	--	--	V
Drain-Source Leakage Current	$V_{DS}=-60V, V_{GS}=0V$	I_{DSS}	--	--	-1.0	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	$V_{GS}=-10V, I_D=-4A$	$R_{DS(ON)}$	--	87	110	m Ω
	$V_{GS}=-4.5V, I_D=-2A$		--	110	130	m Ω
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	-1	-1.7	-2.5	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=-30V, V_{GS}=-10V, I_D=-4A^{(1,2)}$	Q_g	--	10	--	nC
Gate-Source Charge		Q_{gs}	--	1.6	--	
Gate-Drain Charge		Q_{gd}	--	3	--	
Turn-On Delay Time	$V_{DS}=-30V, R_L=30\Omega, V_{GS}=-10V, R_G=6.2\Omega^{(1,2)}$	$T_{d(on)}$	--	8	--	ns
Rise Time		T_r	--	15	--	
Turn-Off Delay Time		$T_{d(off)}$	--	46	--	
Fall Time		T_f	--	8.4	--	
Input Capacitance	$V_{DS}=-30V, V_{GS}=0V, f=1MHz$	C_{iss}	--	785	--	pF
Output Capacitance		C_{oss}	--	175	--	
Reverse Transfer Capacitance		C_{rss}	--	112	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current-Continuous	--	I_S	--	--	-4	A
Diode Forward Voltage	$V_{GS}=0V, I_S=-1A$	V_{SD}	--	-0.76	-1.0	V

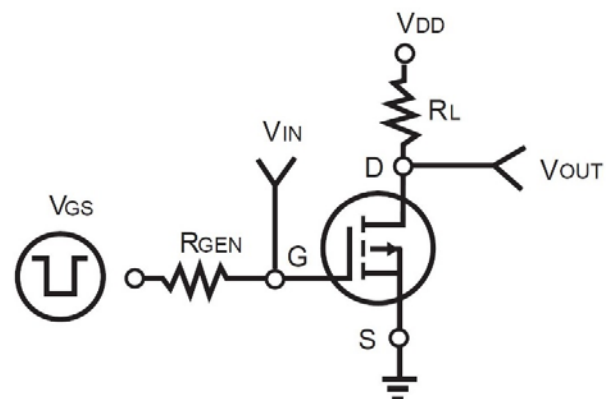
Note:

1. Pulse Widths $\leq 300\mu s$, Duty Cycles $\leq 2\%$
2. Essentially Independent of operating temperature typical characteristics.
3. The maximum current rating is package limited.
4. Repetitive rating, pulse width limited by junction temperature $T_J(MAX)=150^\circ C$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ C$.
5. The test condition is $L=0.1mH, I_{AS}=-16A, V_{DD}=-25V, V_{GS}=-10V$
6. $R_{\theta JA}$ 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 1 inch² with 2oz. square pad of copper.
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8. Guaranteed by design, not subject to production testing.
9. $T_A=25^\circ C$ unless otherwise noted

Switching Time Waveform



Switching Test Circuit



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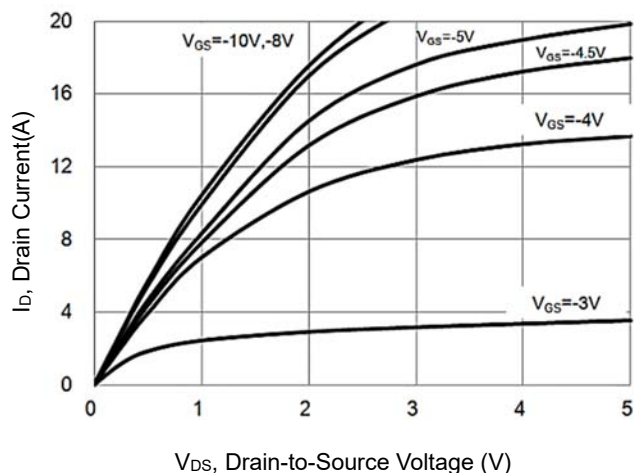
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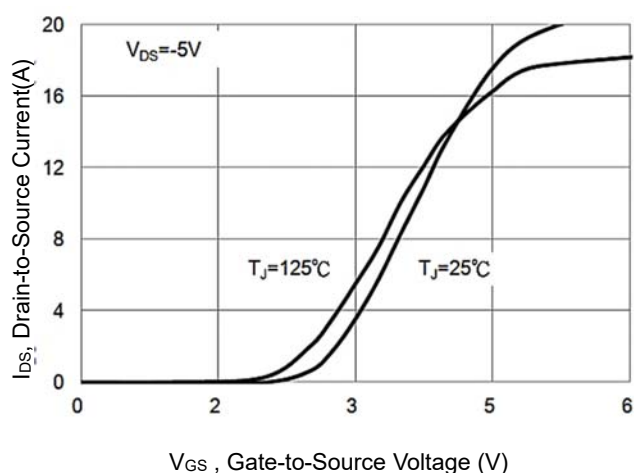
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CHARACTERISTICS CURVES

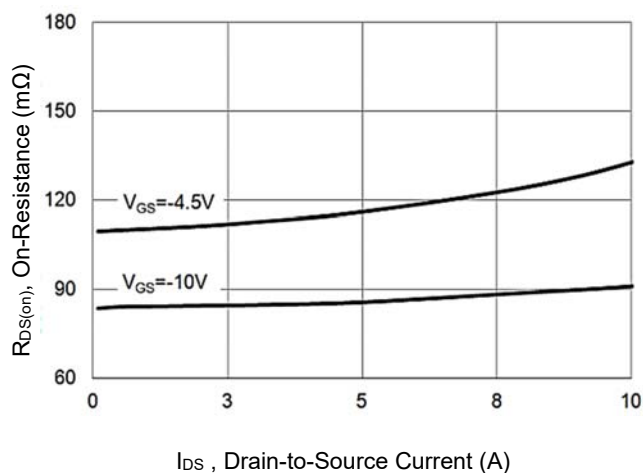
Output Characteristics



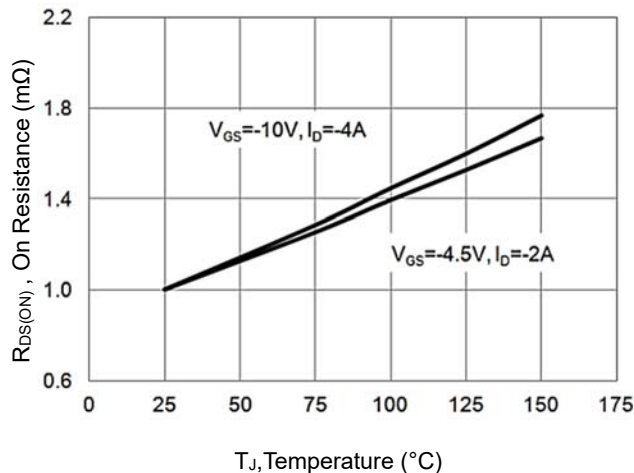
Transfer Characteristics



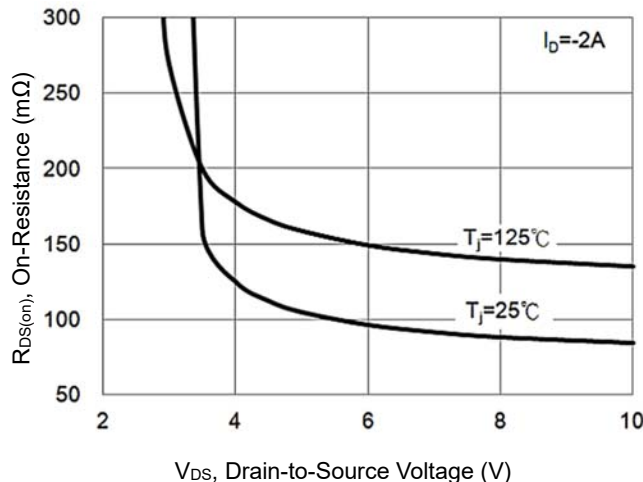
$R_{DS(ON)}$ vs Drain Current



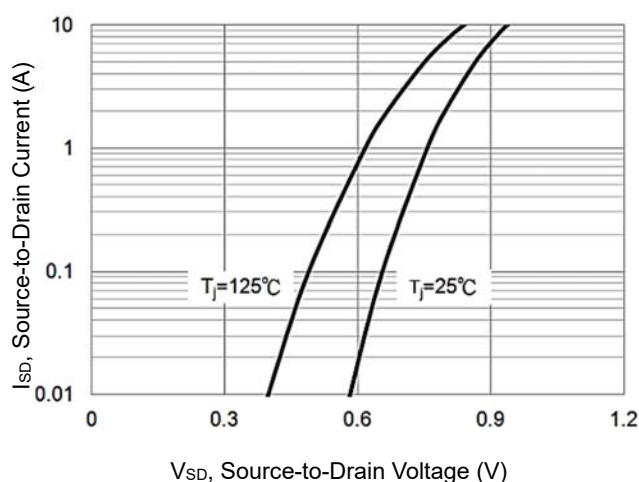
On-Resistance vs Junction Temperature



$R_{DS(ON)}$ vs Drain-Source Voltage



Source-Drain Diode Forward Voltage



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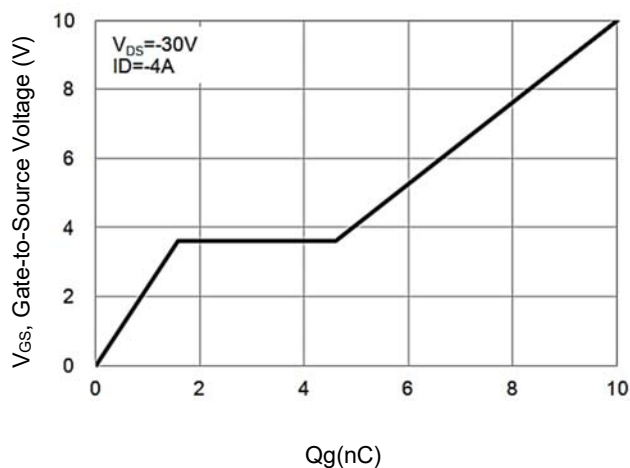
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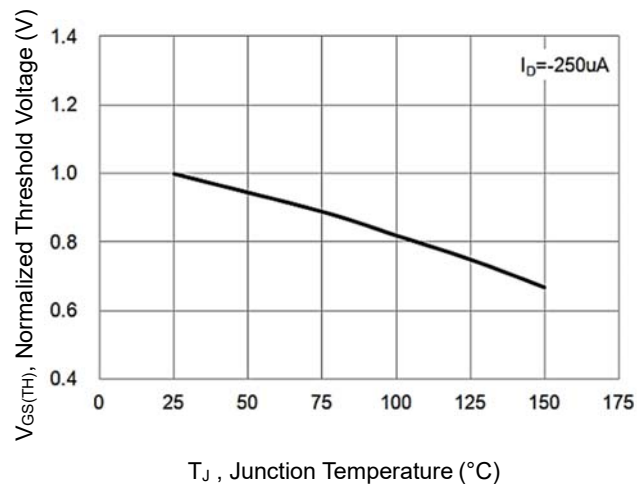
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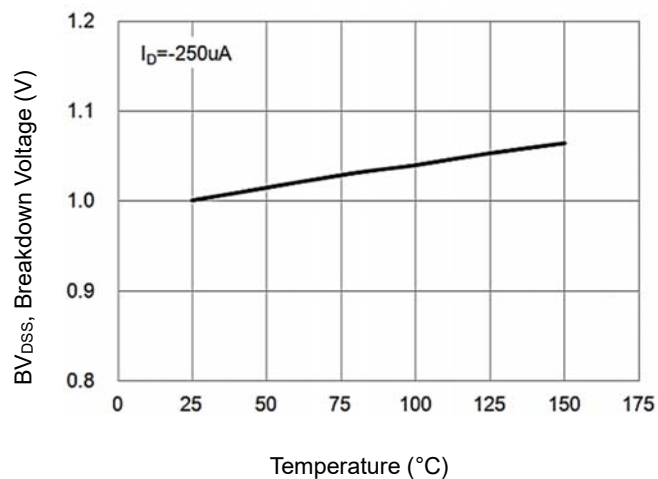
Gate-Charge Characteristics



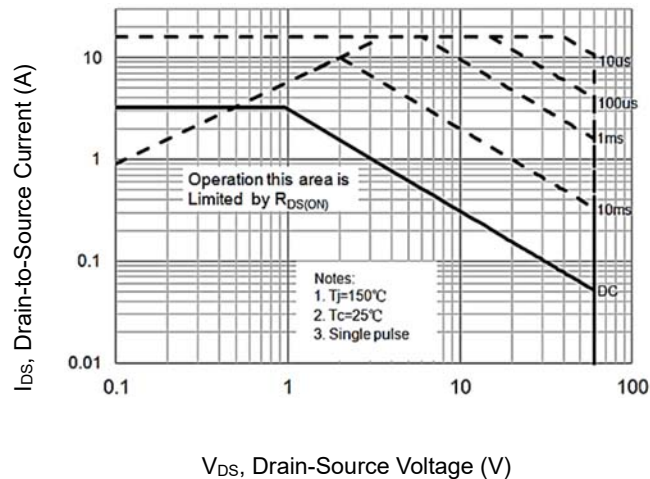
Threshold Voltage vs Junction Temperature



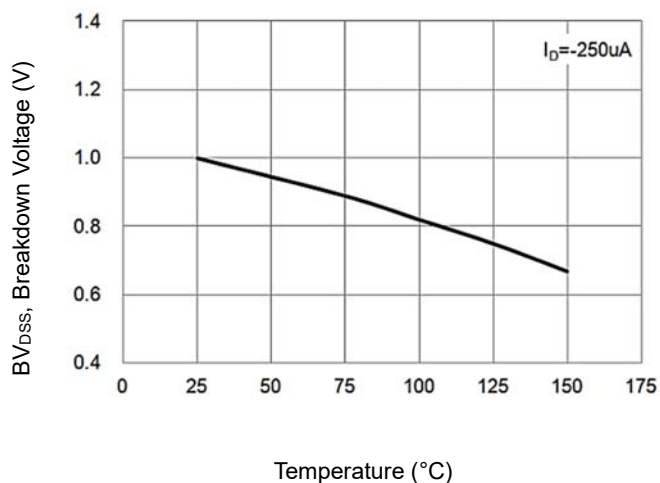
Breakdown Voltage Variation vs Temperature



Maximum Safe Operating Area



Capacitance vs. Drain-Source Voltage



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