

N-Channel MOSFET

20V 3A 0.7W SOT-23

MFT2N3A0S23

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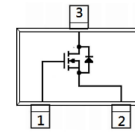
FEATURES

- $R_{DS(ON)} \leq 50m\Omega$ at $V_{GS}=4.5V$
- $R_{DS(ON)} \leq 70m\Omega$ at $V_{GS}=2.5V$
- Low $R_{DS(ON)}$ Reduces Power Loss and Heat
- Low Gate Charge Enables Low Driving Power
- Fast Switching times for improved Efficiency



APPLICATIONS

- Power Management in Load Switching, Battery-powered Devices, DC-DC Converter
- PWM Control in Motor Control, LED Dimming and Lighting, Speed Control
- Microcontroller Interface, Relay and Solenoid Drives

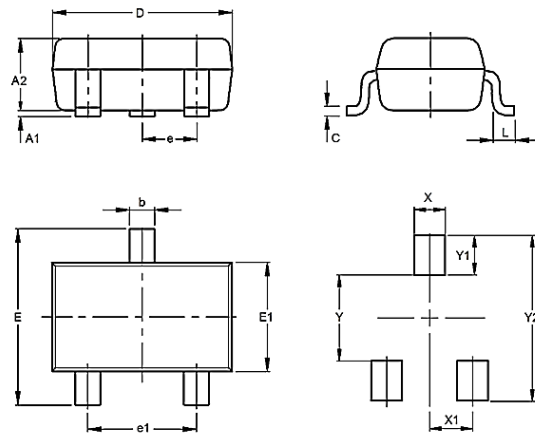


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 10	
Drain Current – Continuous	$T_A=25^{\circ}C$	I_D	3	A
	$T_A=70^{\circ}C$		2.4	
Drain Current – Pulsed		I_{DM}	14	A
Power Dissipation		P_D	0.7	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	178	$^{\circ}C/W$
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^{\circ}C$

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
c	0.10	0.20
D	2.80	3.00
e	0.95 TYP	
e1	1.80	2.00
E	2.25	2.55
E1	1.20	1.40
L	0.30	0.50
X	0.80	
X1	0.95	
Y	1.00	
Y1	1.00	
Y2	3.00	



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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}	20	--	--	V
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	0.55	0.78	1.1	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 10V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=3A$	$R_{DS(on)}$	--	38.5	50	m Ω
	$V_{GS}=2.5V, I_D=2A$		--	53.5	70	
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Input Capacitance	$V_{DS}=10V, V_{GS}=0V, F=1MHz$	C_{iss}	--	220	--	pF
Output Capacitance		C_{oss}	--	34	--	
Reverse Transfer Capacitance		C_{rss}	--	26	--	
Turn-On Delay Time	$V_{DS}=10V, V_{GS}=4.5V, R_L=1.5\Omega, R_G=3\Omega$	$T_{d(on)}$	--	6.8	--	nS
Rise Time		T_r	--	57	--	
Turn-Off Delay Time		$T_{d(off)}$	--	14	--	
Fall Time		T_f	--	53	--	
Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V, I_D=3A$	Q_g	--	3.61	--	nC
Gate-Source Charge		Q_{gs}	--	0.88	--	
Gate-Drain Charge		Q_{gd}	--	0.77	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	3	A
Diode Forward Voltage	$I_S=3A, V_{GS}=0V$	V_{SD}	--	--	1.2	V

Note:

1. $T_A=25^\circ C$, unless otherwise noted.
2. Device mounted on a FR-4 substrate PC board, 1x0.85x0.062inch.
3. Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

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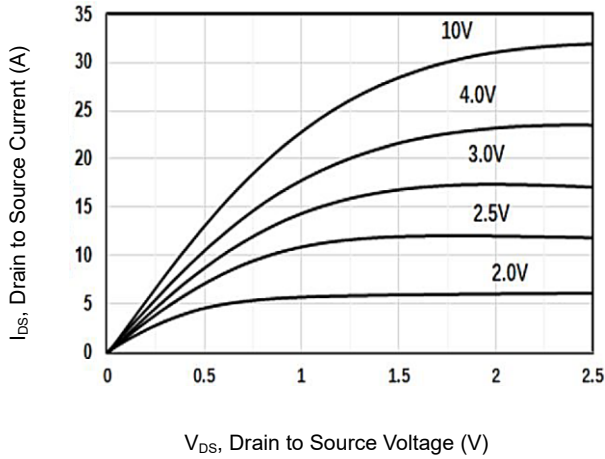
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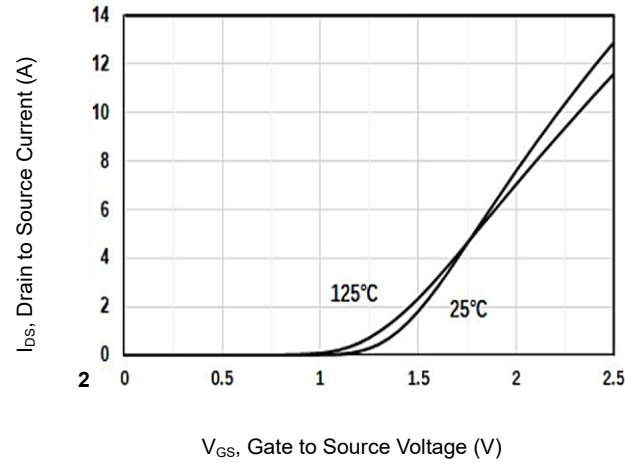
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CHARACTERISTIC CURVES

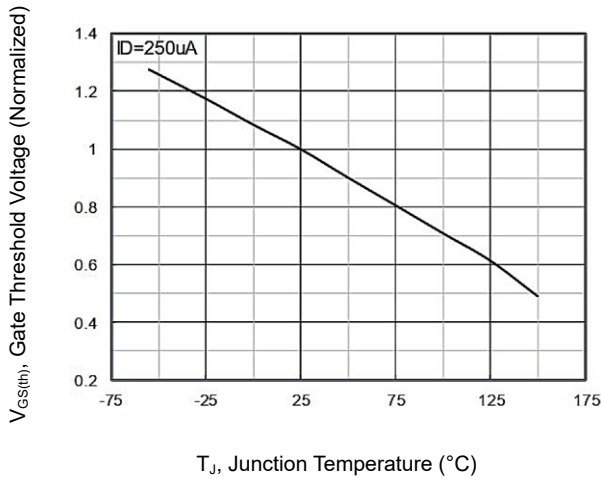
On-Region Characteristics



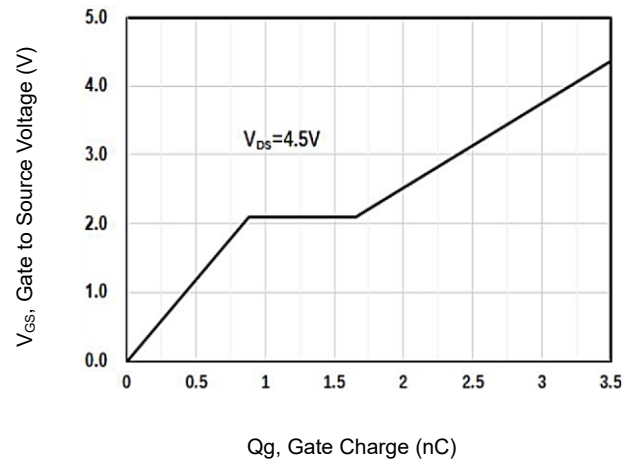
Transfer Characteristics



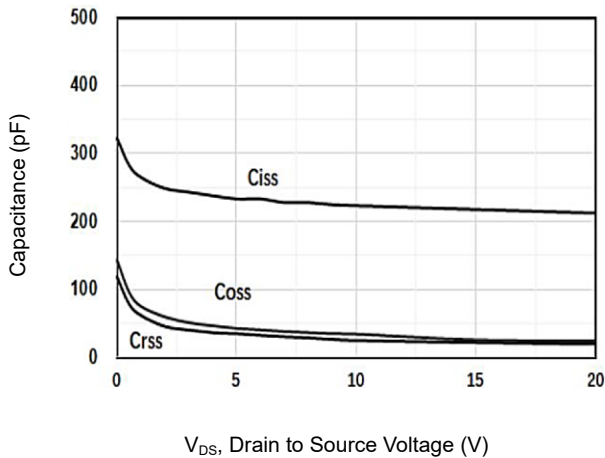
Gate Threshold Voltage vs. Temperature



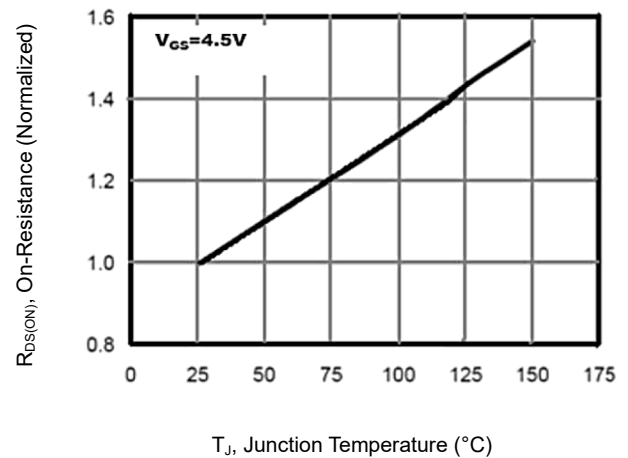
Gate Charge Waveform



Capacitance vs. Drain-Source Voltage



On-Resistance Variation with Temperature



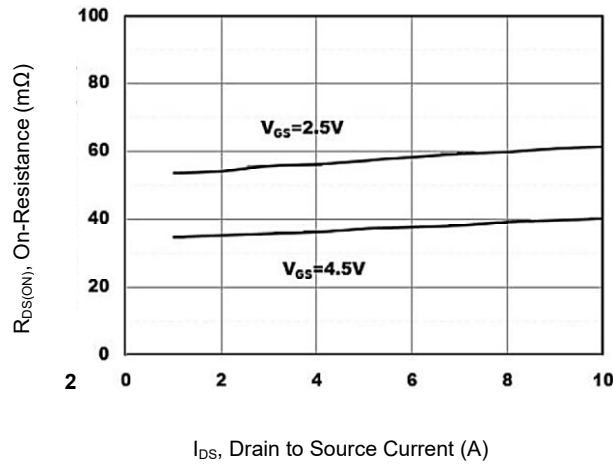
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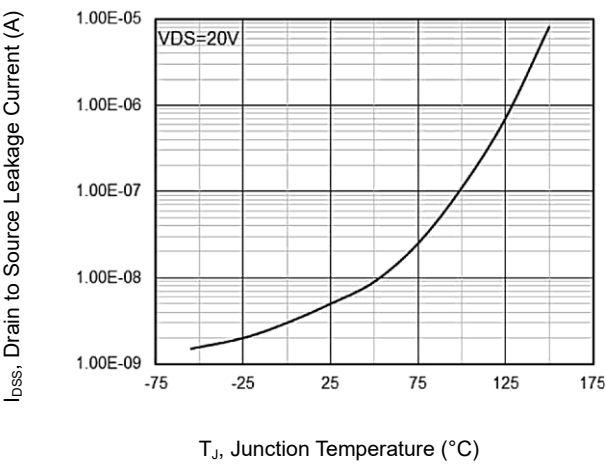
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CHARACTERISTIC CURVES

On-Resistance Variation with Drain Current



Drain to Source Leakage Current



Maximum Safe Operating Area

