

N-Channel MOSFET

20V 5A SOT-23

MFT2N5A0S23

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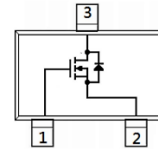
FEATURES

- $R_{DS(ON)} \leq 38m\Omega$ at $V_{GS}=4.5V$
- $R_{DS(ON)} \leq 45m\Omega$ at $V_{GS}=2.5V$
- High Efficiency with Low RDS (on) and Low Gate Charge
- Fast Switching Speed Performance
- Excellent Thermal Performance for Reliable Operation Under Load



APPLICATIONS

- Power Management in Load Switching, DC-DC Converters
- Wearable Electronics, Smartphones and Portable Devices
- Switching Applications in MCU and Logic-level Switching, LED and Display
- Industrial and Embedded Systems in Portal Instruments, Power Distribution

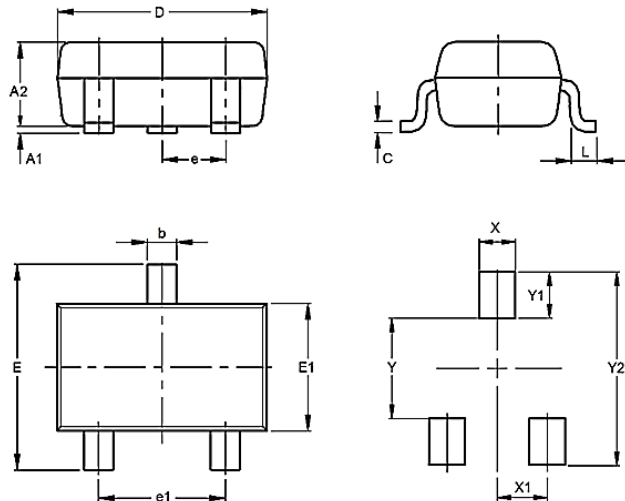


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 12	V
Drain Current – Continuous		I_D	5	A
Drain Current – Pulsed		I_{DM}	22	A
Power Dissipation	$T_A=25^\circ C$	P_D	0.92	W
Thermal Resistance form Junction to Ambient		$R_{\theta JA}$	136	$^\circ C/W$
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	0.08	0.15
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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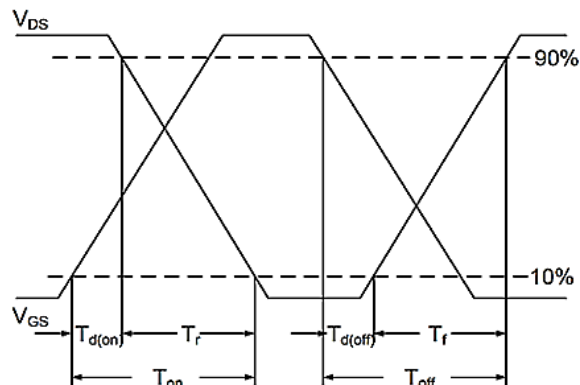
ELECTRICAL CHARACTERISTICS

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	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	0.4	--	1.0	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	I_{GSS}	--	--	± 100	nA
Drain-Source Leakage Current	$V_{DS}=20V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=4A$	$R_{DS(on)}$	--	25	38	m Ω
	$V_{GS}=2.5V, I_D=3A$		--	33	45	
Dynamic Characteristics	Conditions	Symbol	--	Typ.	Max	Unit
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, F=1MHz$	R_g	--	2.6	--	Ω
Input Capacitance	$V_{DS}=10V, V_{GS}=0V, F=1MHz$	C_{iss}	--	339	--	pF
Output Capacitance		C_{oss}	--	47	--	
Reverse Transfer Capacitance		C_{rss}	--	34	--	
Turn-On Delay Time	$V_{DS}=10V, I_D=3.6A, V_{GS}=4.5V, R_G=1\Omega$	$T_{d(on)}$	--	1.8	--	nS
Rise Time		T_r	--	2.8	--	
Turn-Off Delay Time		$T_{d(off)}$	--	8.5	--	
Fall Time		T_f	--	1.7	--	
Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V, I_D=3.6A$	Q_g	--	4.3	--	nC
Gate-Source Charge		Q_{gs}	--	0.5	--	
Gate-Drain Charge		Q_{gd}	--	0.8	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Voltage	$I_S=1A, V_{GS}=0V$	V_{SD}	--	--	1.2	V
Reverse Recovery Time	$I_S=3.6A, di/dt=100A/\mu s$	t_{rr}	--	4.7	--	nS
Reverse Recovery Charge		Q_{rr}	--	0.7	--	nC

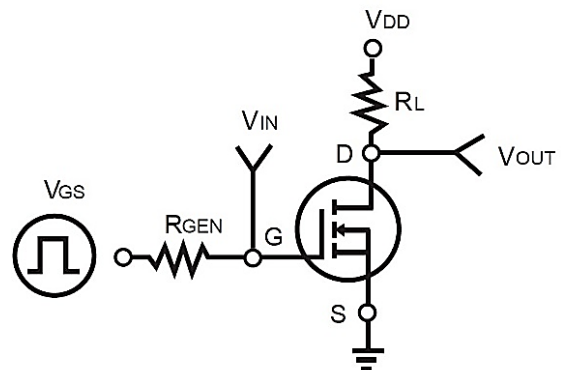
Note:

1. $T_A=25^\circ C$, unless otherwise noted
2. Pulse width $\leq 100\mu s$, Duty cycle $\leq 1\%$, pulse width limited by max junction temperature T_J .
3. Device mounted on a FR-4 substrate PC board, 2oz copper, with 1 inch² copper plate in still air.

Switching Time Waveform



Switching Test Circuit



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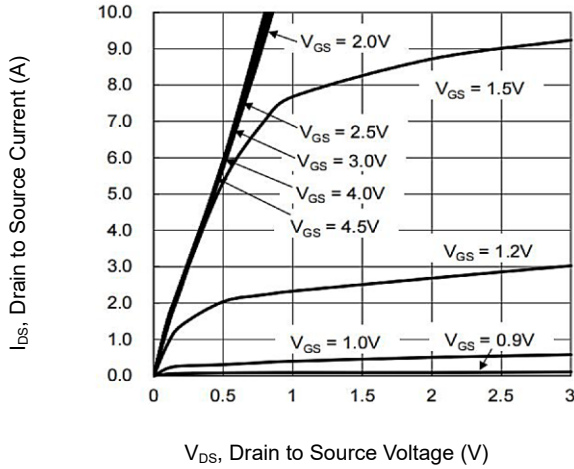
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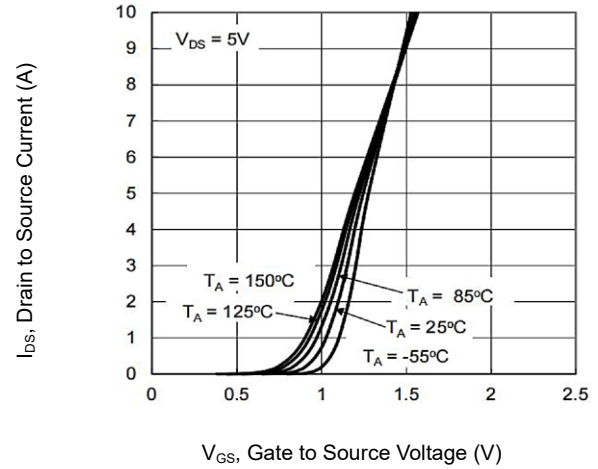
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CHARACTERISTIC CURVES

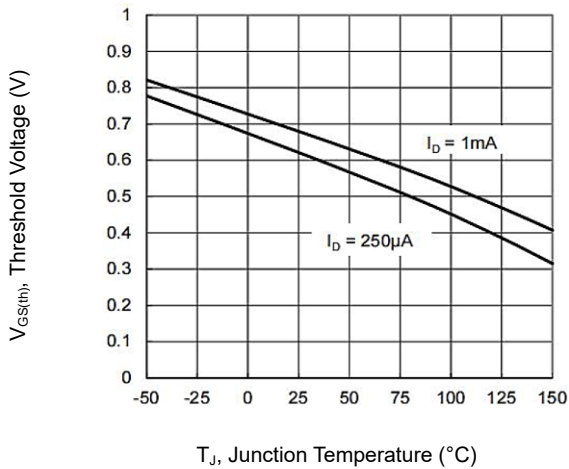
Output Characteristics



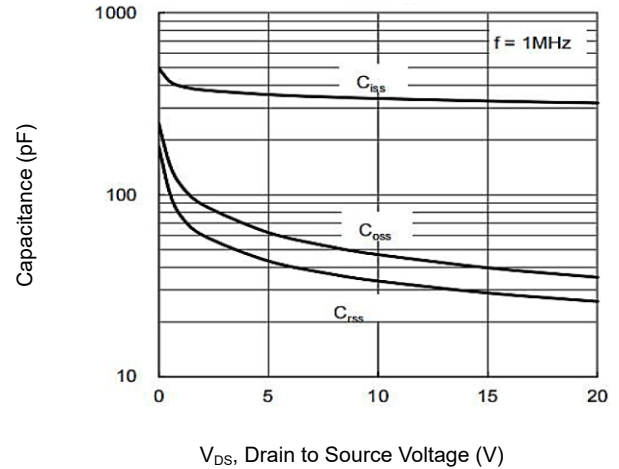
Transfer Characteristics



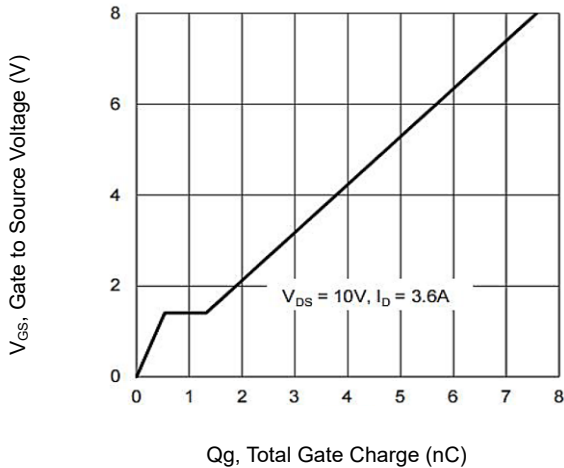
Threshold Voltage vs. Junction Temperature



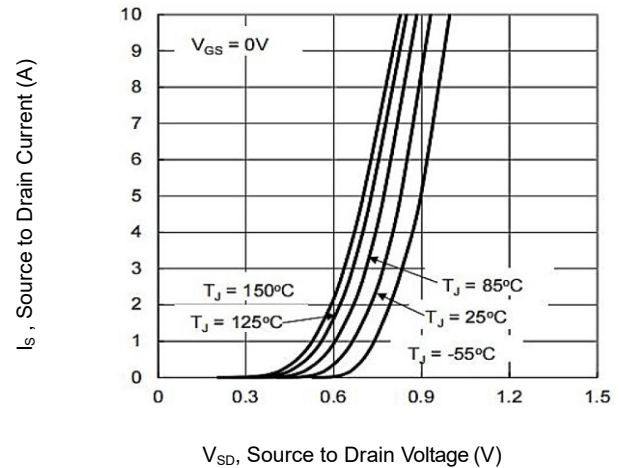
Capacitance



Gate Charge Characteristics



Body Diode Characteristics



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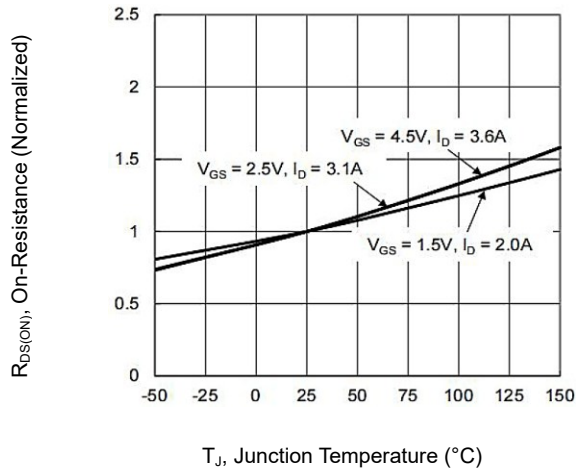
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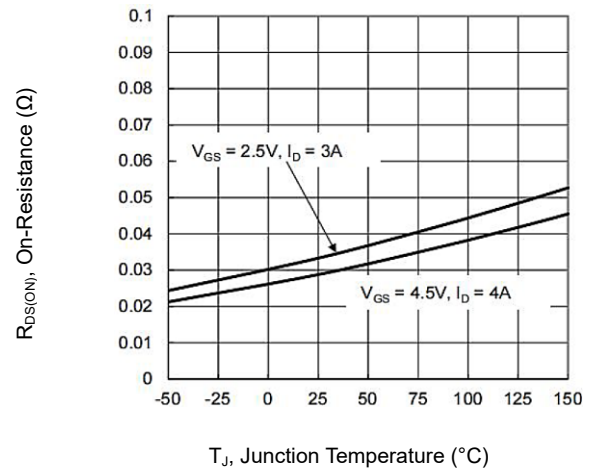
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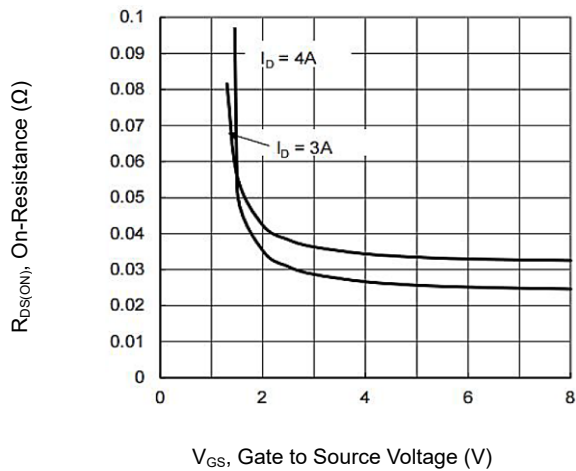
On-Resistance vs. Temperature



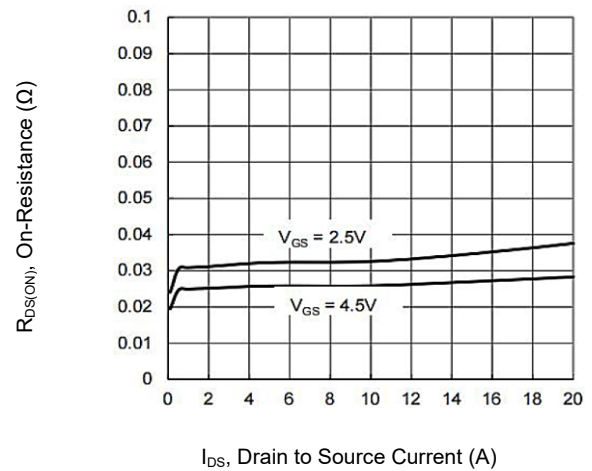
On-Resistance vs. Temperature



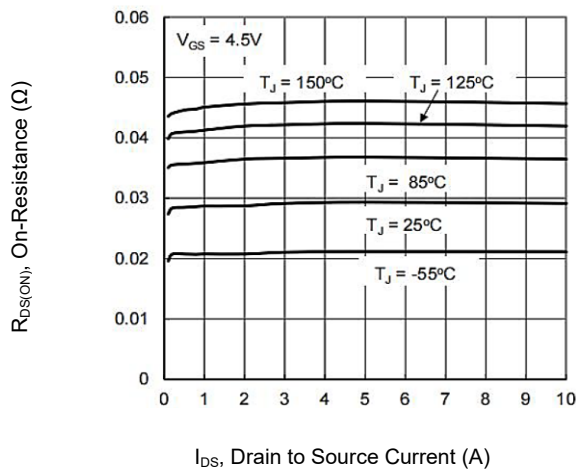
On-Resistance vs. Gate-Source Voltage and Drain Current



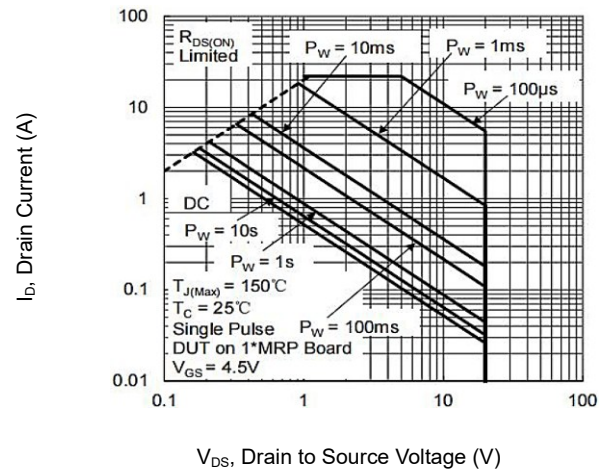
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Drain Current and Temperature



Maximum Safe Operating Area



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CHARACTERISTIC CURVES

Normalized Transient Thermal Resistance

