

N-Channel MOSFET

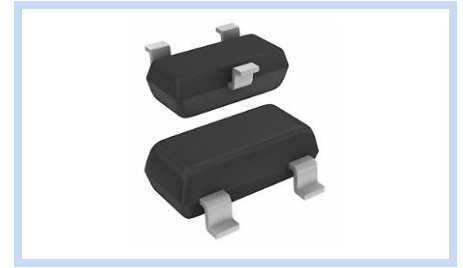
30V 5.6A 1.25W SOT-23

MFT3N5A6S23

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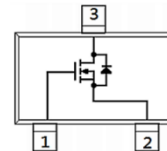
FEATURE

- $R_{DS(ON)} < 23m\Omega$, $V_{GS}=10V$
- $R_{DS(ON)} < 29m\Omega$, $V_{GS}=4.5V$
- Low On-Resistance
- Low Input/Output Leakage
- Application: Battery Charging, Power Management Functions, DC-DC Converters, Portable Power Adaptors



MECHANICAL DATA

- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

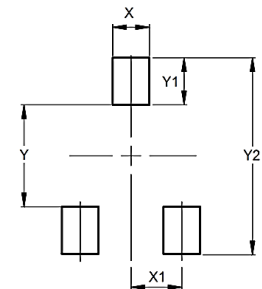
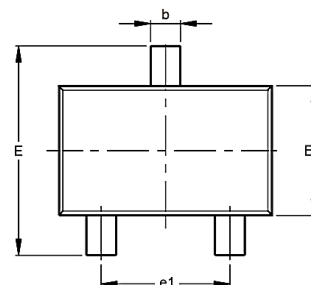
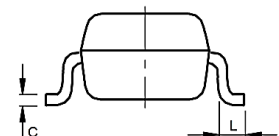
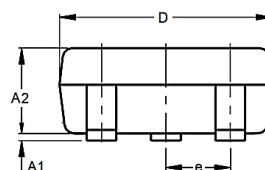


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous		I_D	5.6	A
Drain Current – Pulsed		I_{DM}	22	A
Power Dissipation	$T_A=25^\circ C$	P_D	1.25	W
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	100	$^\circ C / W$
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	0.80	1.10
b	0.30	0.50
c	0.08	0.20
D	2.70	3.10
e	0.89	1.02
e1	1.78	2.04
E	2.10	2.90
E1	1.20	1.60
L	0.15	--
X	0.80	--
X1	0.95	
Y	1.00	
Y1	1.00	
Y2	3.00	



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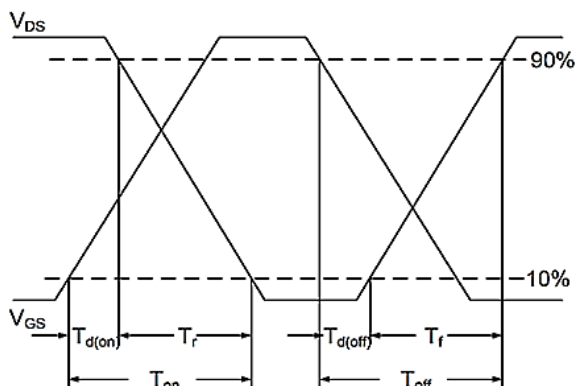
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$I_D=250\ \mu A$	BV_{DSS}	30	--	--	V
Drain-Source Leakage Current	$V_{DS}=24V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	--	--	± 0.1	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=5.6A$	$R_{DS(ON)}$	--	--	23	m Ω
	$V_{GS}=4.5V, I_D=3.5A$		--	--	29	m Ω
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	--	2.1	V
Forward Transconductance	$V_{DS}=5V, I_D=3.5A$	g_{FS}	--	16	--	S
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, F=1MHz$	R_g	--	1.4	--	Ω
Total Gate Charge	$V_{DS}=15V, V_{GS}=4.5V, I_D=5.6A$	Q_g	--	11	--	nC
	$V_{DS}=15V, V_{GS}=10V, I_D=5.6A$		--	23	--	
Gate-Source Charge	$V_{DS}=15V, V_{GS}=10V, I_D=5.6A$	Q_{gs}	--	4	--	
Gate-Drain Charge		Q_{gd}	--	5	--	
Turn-On Delay Time	$V_{DS}=15V, V_{GS}=10V, R_G=2.2\Omega, I_D=5.6A$	$T_{d(on)}$	--	10	--	ns
Rise Time		T_r	--	30	--	
Turn-Off Delay Time		$T_{d(off)}$	--	11	--	
Fall Time		T_f	--	2	--	
Input Capacitance	$V_{DS}=15V, V_{GS}=0V, F=1MHz$	C_{iss}	--	1046	--	pF
Output Capacitance		C_{oss}	--	134	--	
Reverse Transfer Capacitance		C_{rss}	--	101	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Continuous Forward Current	--	I_S	--	--	5.6	A
Diode Forward Voltage	$V_{GS}=0V, I_S=1A$	V_{SD}	--	--	1.2	V
Reverse Recovery Time	$I_S=5.6A, di/dt=100A/\mu s$	t_{rr}	--	10	--	ns
Reverse Recovery Charge		Q_{rr}	--	3	--	nC

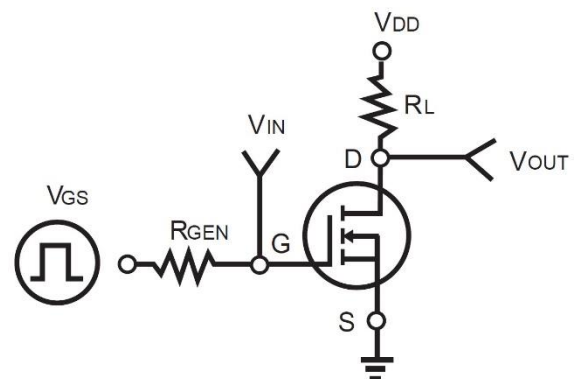
Note:

1. Pulse width<100 μs , Duty cycle<2%. Repetitive rating, pulse width limited by max junction temperature T_J
2. $R_{\theta JA}$ 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-inch FR-4 with 2oz square pad of copper.
3. Guaranteed by design, not subject to production testing.
4. The maximum current rating is package limited.
5. Essential independent of operating temperature typical characteristics

Switching Time Waveform



Switching Test Circuit



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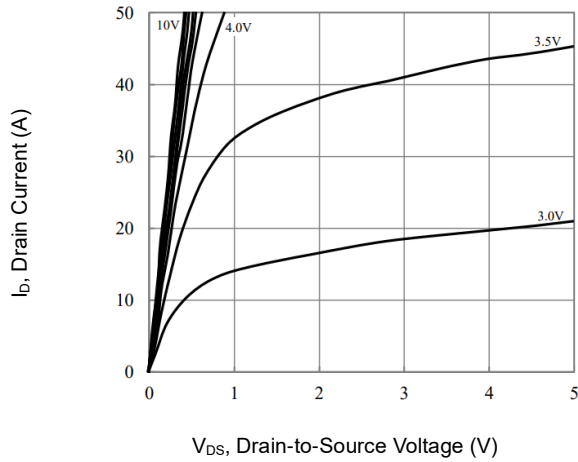
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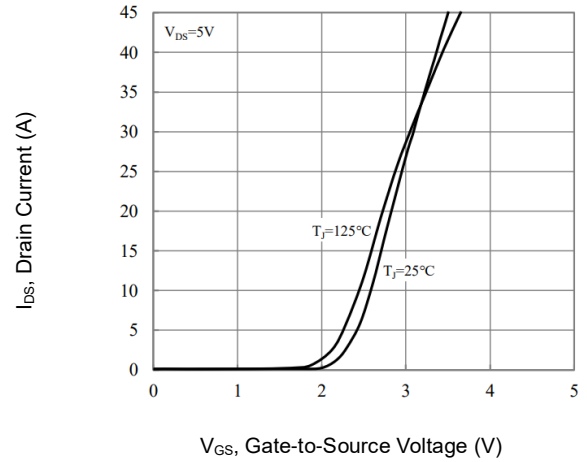
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CHARACTERISTIC CURVES

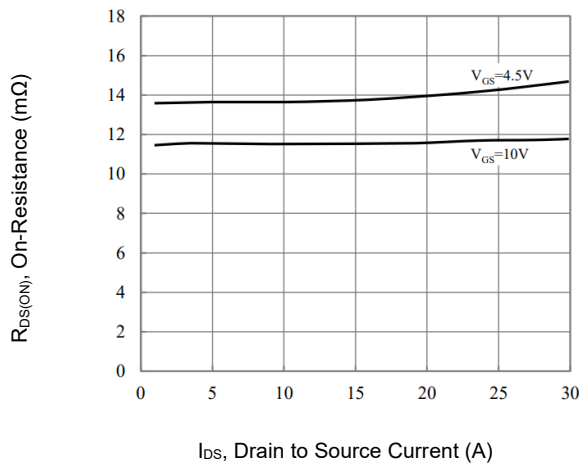
On Region Characteristics



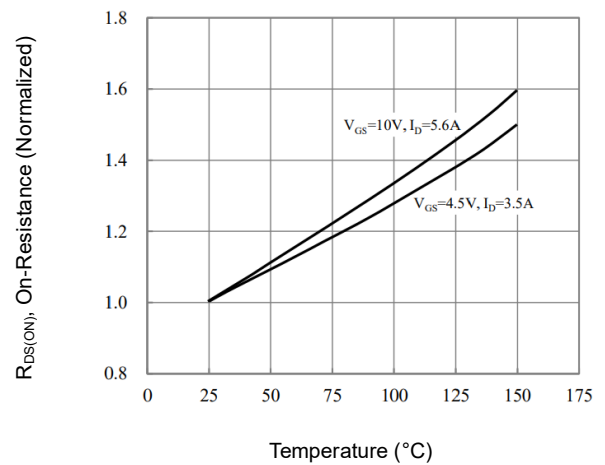
Transfer Characteristics



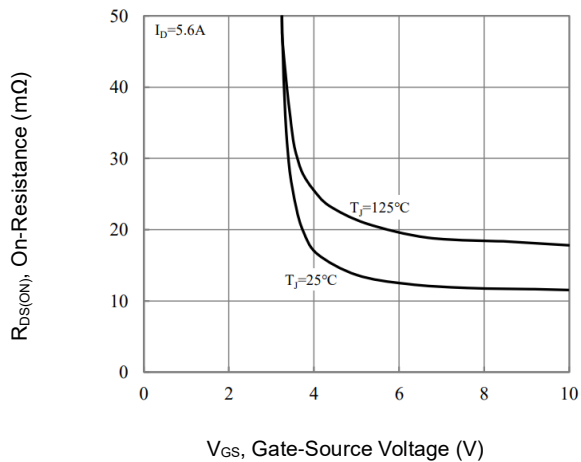
On-Resistance vs. Drain Current



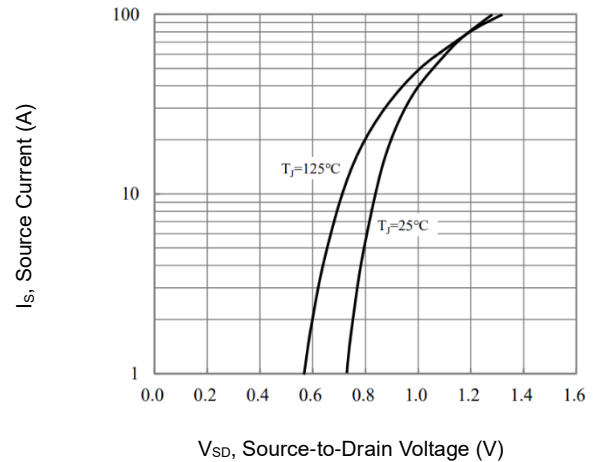
On-Resistance vs. Junction Temperature



On-Resistance Variation with VGS



Body Diode Characteristics



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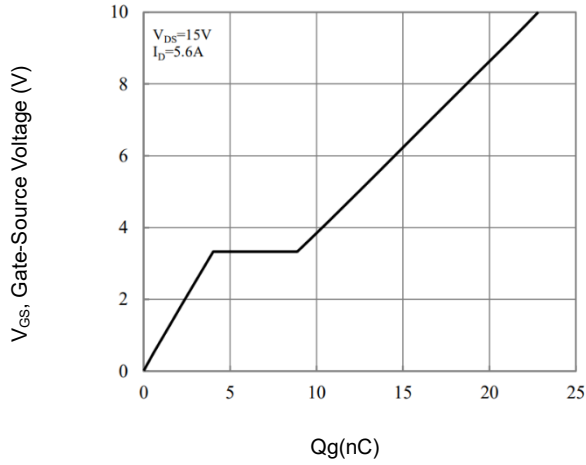
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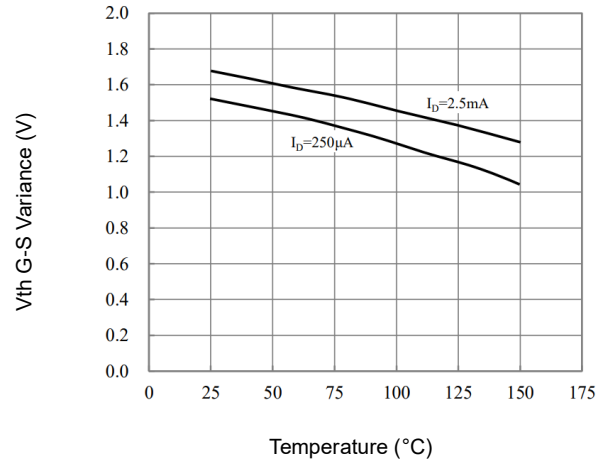
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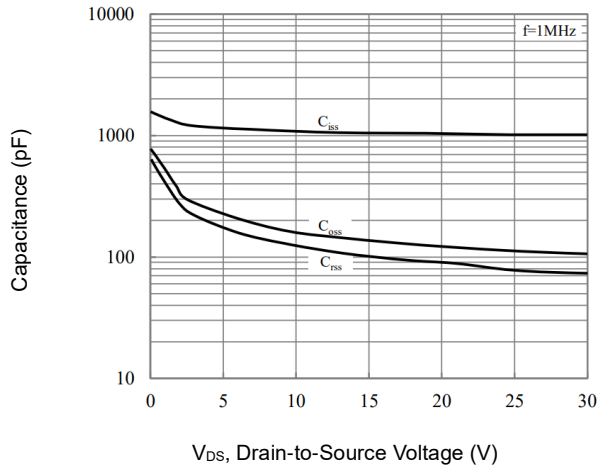
Gate Charge Characteristics



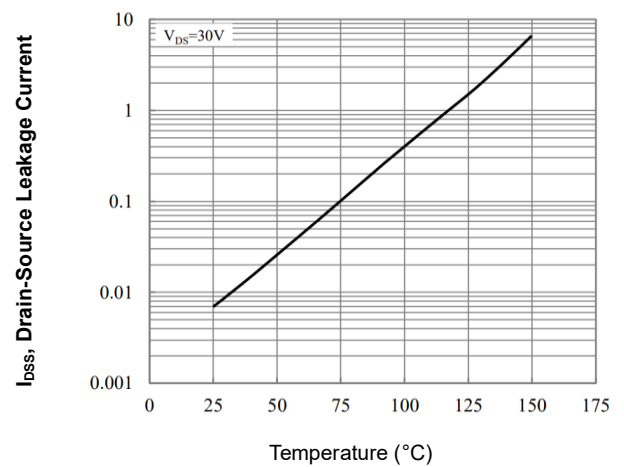
Threshold Voltage Variance vs. Temperature



Capacitance vs. Drain-Source Voltage



Drain-Source Leakage Current vs Temperature



Drain-Source Breakdown Voltage vs Temperature

