

2N Channel MOSFET

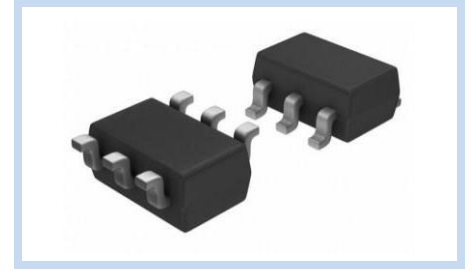
20V 3.7A 1.25W SOT-23-6L

MFT22N3A7S236

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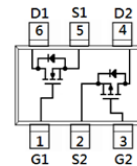
FEATURE

- $R_{DS(ON)} < 56m\Omega$, $V_{GS} = 4.5V$, $I_D = 3.7A$
- $R_{DS(ON)} < 69m\Omega$, $V_{GS} = 2.5V$, $I_D = 2.8A$
- $R_{DS(ON)} < 98m\Omega$, $V_{GS} = 1.8V$, $I_D = 1.5A$
- Advanced Trench Process Technology
- Application: Switch Load, PWM Systems, etc.
- High Density Cell Design For Ultra Low On-Resistance



MECHANICAL DATA

- Case: SOT-23-6L Package
- Terminals: Solderable per MIL-STD-750, Method 2026

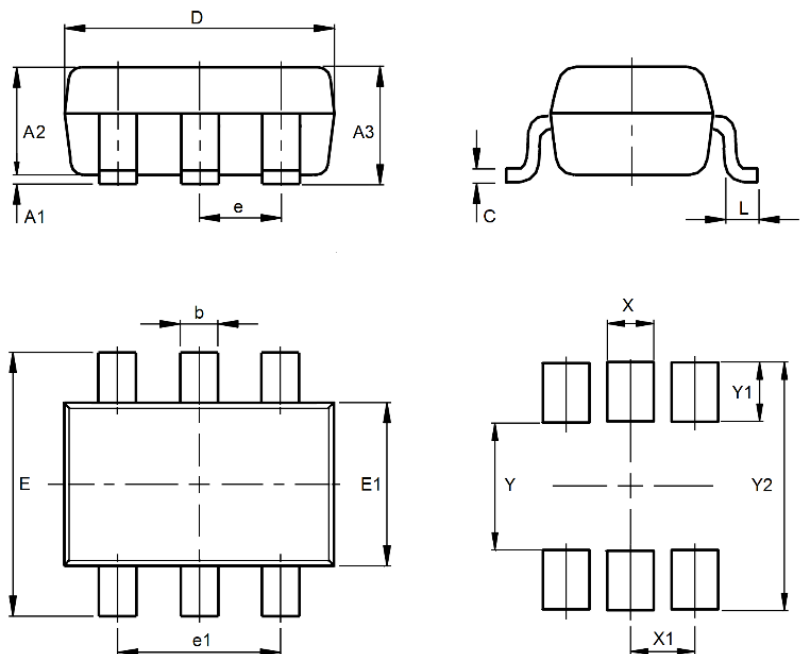


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	V_{DS}	20	V	
Gate-Source Voltage	V_{GS}	± 12	V	
Drain Current – Continuous	I_D	3.7	A	
Drain Current – Pulsed	I_{DM}	14.8	A	
Power Dissipation	P_D	$T_A = 25^\circ C$	1.25	W
		Derate above $25^\circ C$	10	mW
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	100	$^\circ C/W$	
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 to +150	$^\circ C$	

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	--	0.10
A2	1.00	1.20
A3	1.00	1.30
b	0.30	0.50
c	0.08	0.20
D	2.70	3.10
E	2.60	3.00
E1	1.50	1.70
e	0.95	
e1	1.70	2.10
L	0.20	0.60
X	0.80	
X1	0.95	
Y	1.10	
Y1	0.90	
Y2	2.90	



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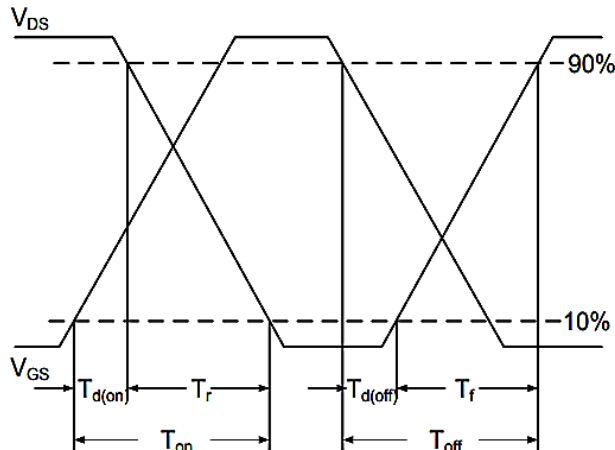
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	20	--	--	V
Drain-Source Leakage Current	$V_{DS}=20V, V_{GS}=0V,$	I_{DSS}	--	-0.01	1	μA
Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	I_{GSS}	--	± 10	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=3.7A$	$R_{DS(ON)}$	--	41	56	m Ω
	$V_{GS}=2.5V, I_D=2.8A$		--	51	69	
	$V_{GS}=1.8V, I_D=1.5A$		--	69	98	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	0.4	0.67	1.2	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V, I_D=3.7A$	Q_g	--	4.57	--	nC
Gate-Source Charge		Q_{gs}	--	0.77	--	nC
Gate-Drain Charge		Q_{gd}	--	0.98	--	nC
Turn-On Delay Time	$V_{DD}=10V, V_{GS}=4.5V, R_G=6\Omega, I_D=3.7A,$	$T_{d(on)}$	--	3.4	--	ns
Rise Time		T_r	--	47	--	ns
Turn-Off Delay Time		$T_{d(off)}$	--	18	--	ns
Fall Time		T_f	--	10	--	ns
Input Capacitance	$V_{DS}=10V, V_{GS}=0V, F=1MHz$	C_{iss}	--	350	--	pF
Output Capacitance		C_{oss}	--	40	--	pF
Reverse Transfer Capacitance		C_{rss}	--	29.3	--	pF
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	1.5	A
Diode Forward Voltage	$V_{GS}=0V, I_S=1A$	V_{SD}	--	0.75	1.2	V

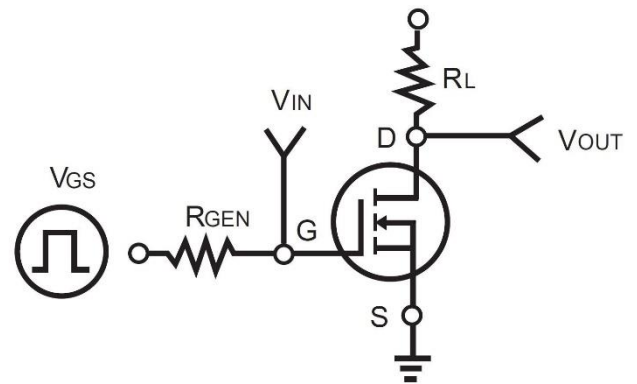
Note:

- $R_{\theta JA}$ 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 1 inch FR-4 with 2oz. Square pad of copper.
- Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- Essentially independent of operating temperature.
- The Maximum current rating is package limited.

Switching Time Waveform



Switching Test Circuit



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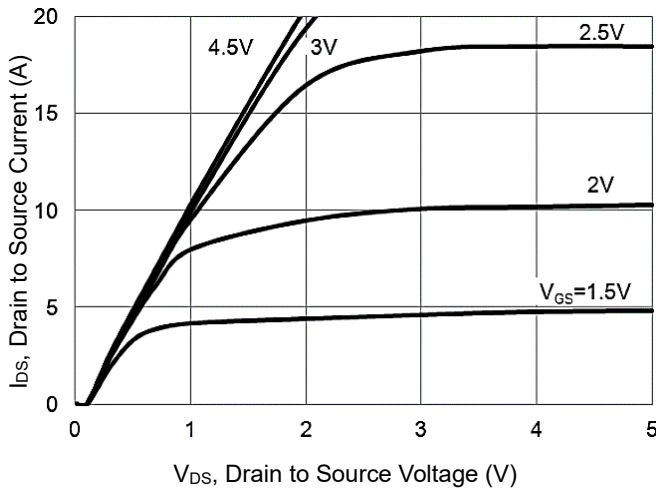
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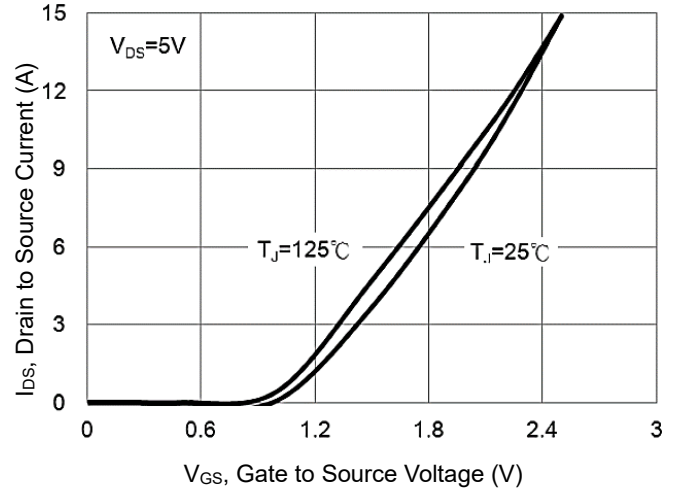
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CHARACTERISTIC CURVES

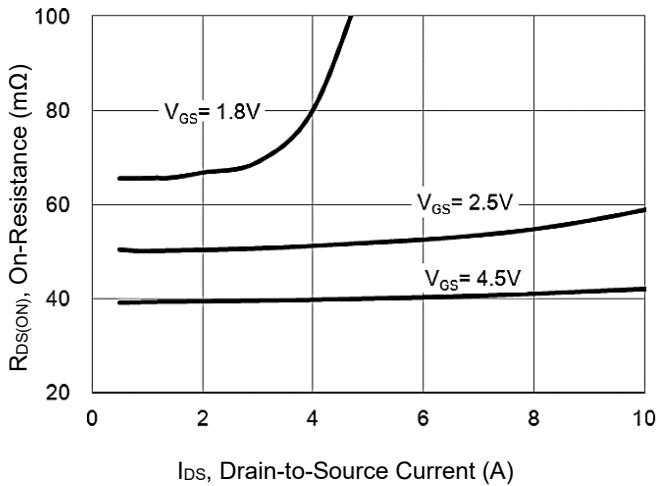
On-Region Characteristics



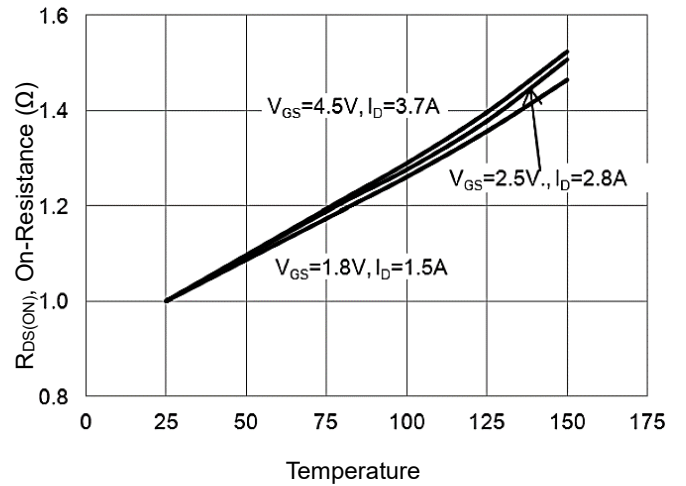
Transfer Characteristics



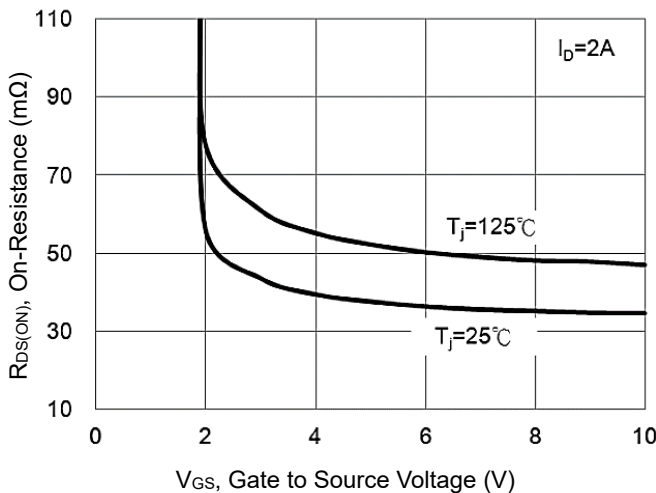
On-resistance vs Drain Current



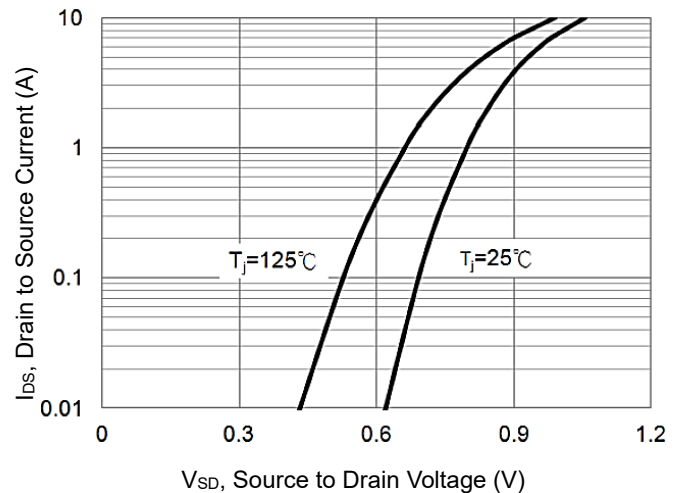
On-resistance vs Drain Current



On-Resistance vs. Junction Temperature

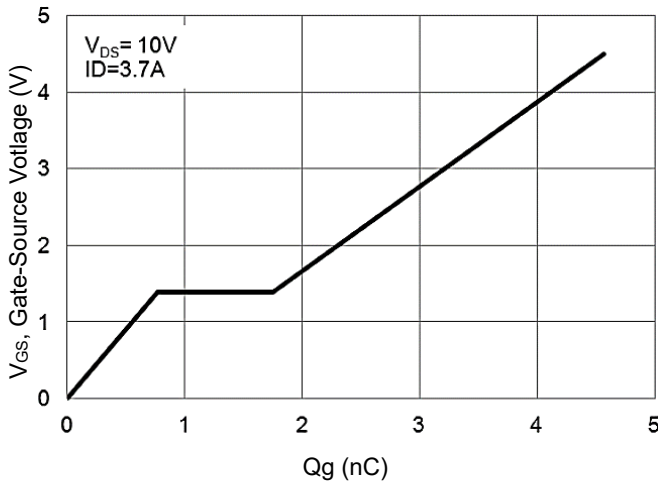


Body Diode

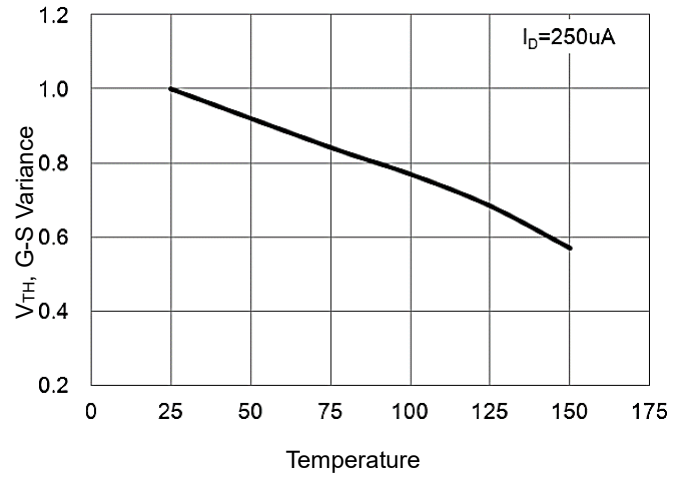


CHARACTERISTIC CURVES

Gate-Charge Characteristics



Threshold Voltage Variation with Temperature



Threshold Voltage Variance vs. Temperature

