

N-Channel MOSFET

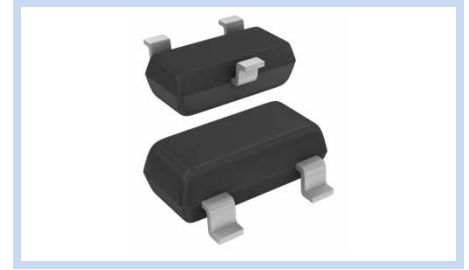
20V 0.5A SOT-323

MFT2NA5S323E

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FEATURE

- Operating temperature: -55 ~ 150 °C
- Advanced Trench Process Technology
- ESD Protected Design
- Designed for Switch Load, PWM Application

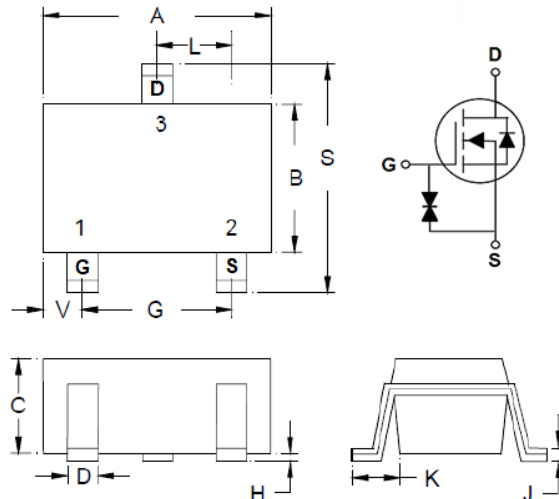


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 10	V
Drain Current – Continuous		I_D	0.5	A
Drain Current – Pulsed		I_{DM}	1.0	A
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	0.35	W
	Derate above 25°C		2.8	mW/°C
Operating Junction Temperature Range		T_J, T_{stg}	-55 to 150	°C
Thermal Resistance, Junction-to-Ambient		$R_{\theta JA}$	357	°C/W

DIMENSIONS

Item	Min (mm)	Max (mm)
A	1.80	2.20
B	1.5	1.35
C	0.90	1.10
D	0.20	0.40
G	1.20	1.40
H	0.00	0.10
J	0.05	0.15
K	0.30	0.67
L	--	--
S	2.10	2.95
V	--	--



SOT-323

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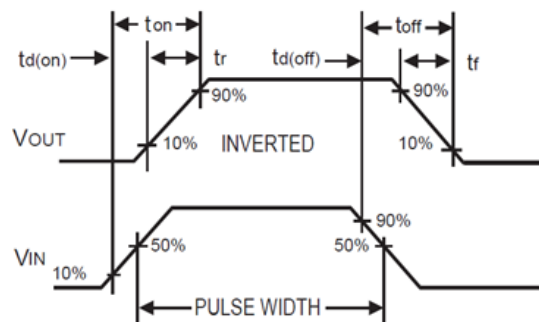
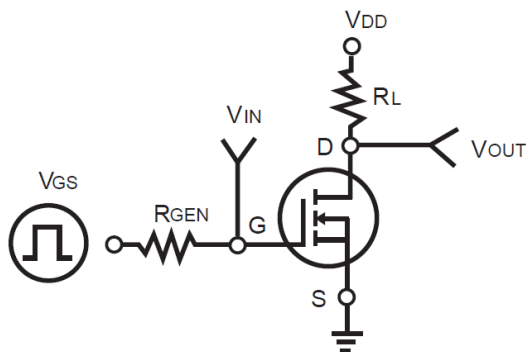
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ELECTRICAL CHARACTERISTICS

Static 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	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	0.3	0.65	0.9	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 8V$	I_{GSS}	--	± 0.5	± 10	μA
Zero Gate Voltage Drain Current	$V_{DS}=16V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=500mA$	$R_{DS(ON)}$	--	280	400	m Ω
	$V_{GS}=2.5V, I_D=200mA$		--	350	650	
	$V_{GS}=1.8V, I_D=100mA$		--	400	800	
	$V_{GS}=1.5V, I_D=50mA$		--	500	1200	
	$V_{GS}=1.2V, I_D=20mA$		--	700	3000	
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Input Capacitance	$V_{DS}=10V, V_{GS}=0V$ $F=1.0MHz$	C_{iss}	--	67	--	pF
Output Capacitance		C_{oss}	--	19	--	
Reverse Transfer Capacitance		C_{rss}	--	6	--	
Turn-On Delay Time	$V_{DS}=10V, I_D=150mA$ $V_{GS}=4.0V, R_{GEN}=3.3\Omega$	$T_{d(on)}$	--	2.8	--	nS
Rise Time		T_r	--	20	--	
Turn-Off Delay Time		$T_{d(off)}$	--	23	--	
Fall Time		T_f	--	23	--	
Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V,$ $I_D=500mA$	Q_g	--	1.4	--	nC
Gate-Source Charge		Q_{gs}	--	0.22	--	
Gate-Drain Charge		Q_{gd}	--	0.21	--	
Maximum Continuous Drain-Source Diode Forward Current	--	I_S	--	--	500	mA
Diode Forward Voltage	$I_S=500mA, V_{GS}=0V$	V_{SD}	--	0.87	1.3	V

Note:

1. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
2. Essentially independent of operating temperature typical characteristics
3. $R_{\theta JA}$ is the sum of the junction to case to ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins mounted on a 1inch FR-4 with 2oz. square pad of copper.
4. The maximum current rating is package limited.
5. Guaranteed by design, not subject to production testing.



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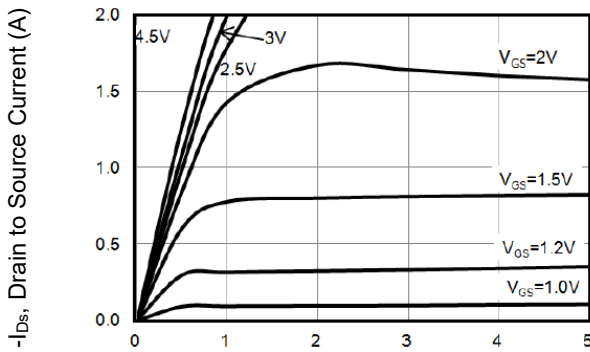
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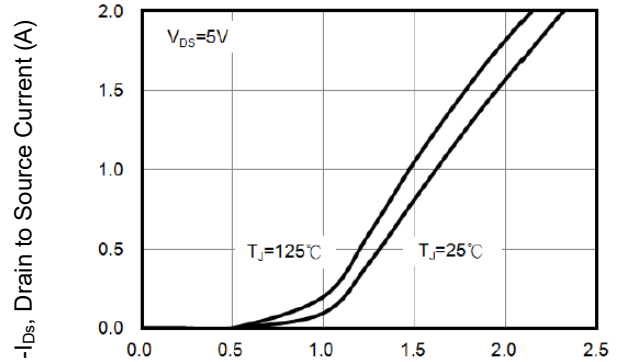
CHARACTERISTIC CURVES

Typical Characteristics



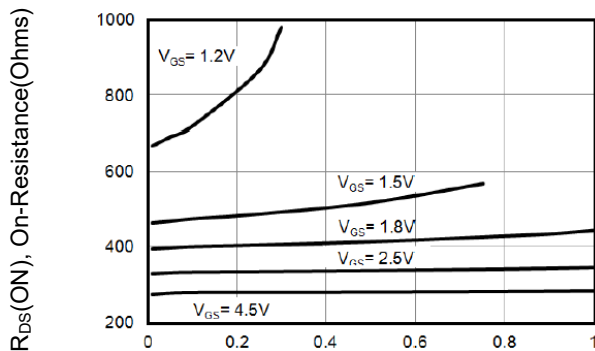
V_{DS} , Drain-to-Source Voltage (V)

Transfer Characteristics



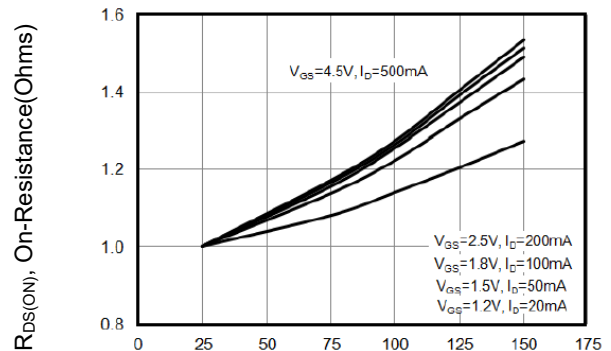
V_{GS} , Gate-to-Source Voltage (V)

On-Resistance Variation vs. Drain Current



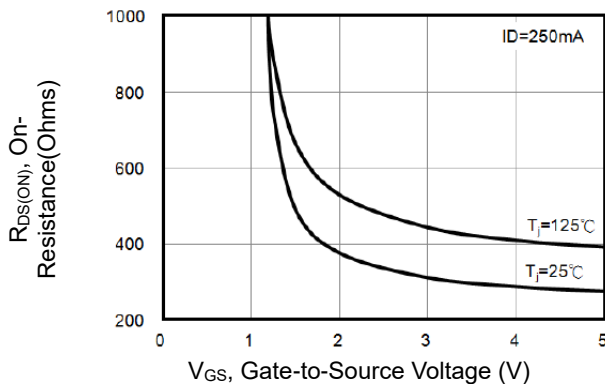
I_{DS} , Drain to Source Current (A)

On-Resistance Variation vs. Temperature



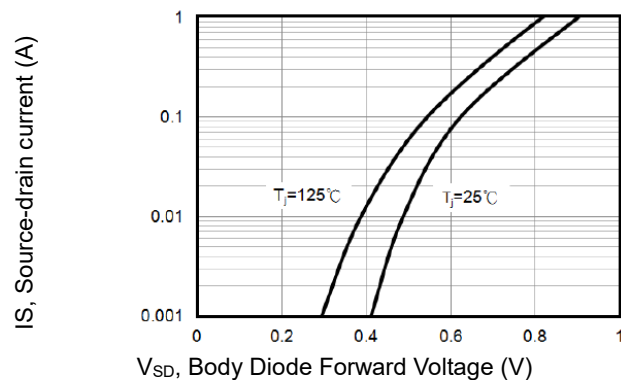
T_J , Junction Temperature($^\circ C$)

On-Resistance Variation vs. V_{GS}



V_{GS} , Gate-to-Source Voltage (V)

Body Diode Characteristics



V_{SD} , Body Diode Forward Voltage (V)

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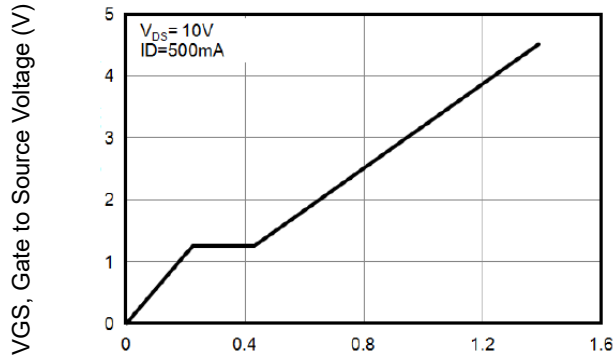
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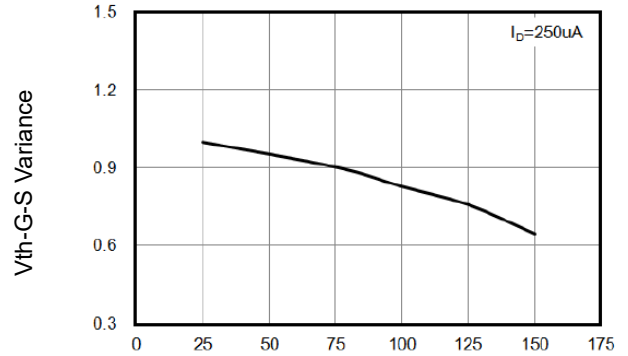
CHARACTERISTICS CURVES (CONTINUED)

Gate Charge Characteristics



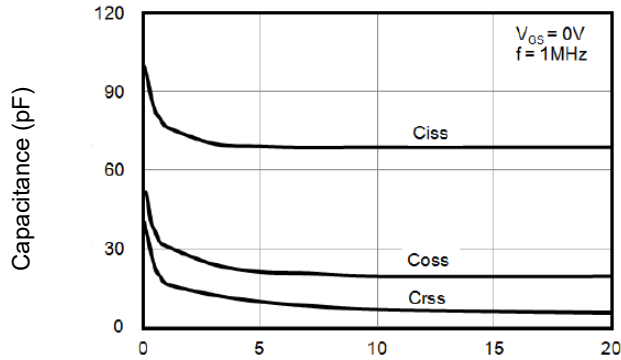
Qg, Total Gate Charge (nC)

Threshold Voltage Variation with Temperature



Temperature(°C)

Capacitance vs. Drain Source Voltage



VDS, Drain-to-Source Voltage (V)

*Specifications subject to change without notice.