

N-Channel MOSFET

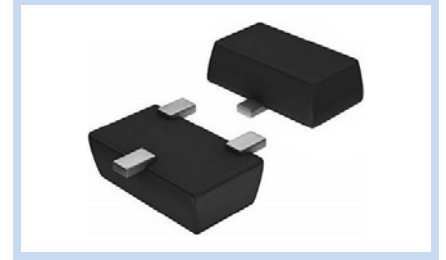
50V SOT-523 ESD AEC-Q101

MFT5NA35S523EA

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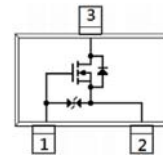
FEATURE

- $R_{DS(ON)} < 1.6\Omega$, $V_{GS}=10V$, $I_D=500mA$
- $R_{DS(ON)} < 2.5\Omega$, $V_{GS}=4.5V$, $I_D=200mA$
- $R_{DS(ON)} < 4.5\Omega$, $V_{GS}=2.5V$, $I_D=100mA$
- Advanced Trench Process Technology
- ESD Protected 2KV HBM
- AEC-Q101 qualified



MECHANICAL DATA

- Case: SOT-523 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

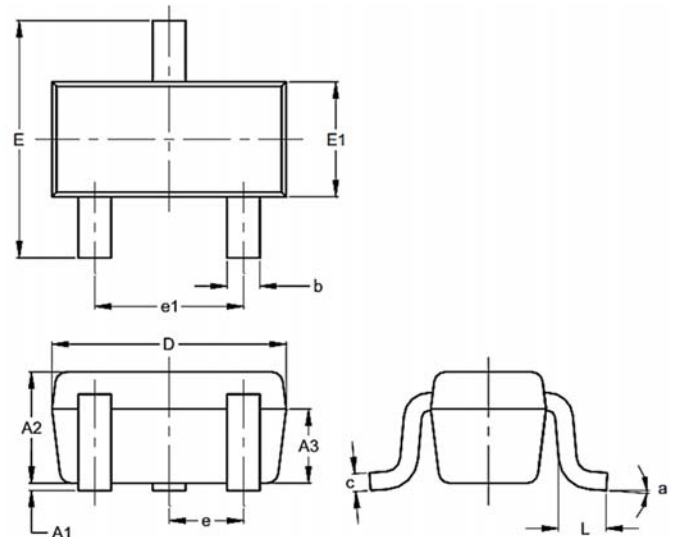


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	350	mA
Pulsed Drain Current	I_{DM}	1.2	A
Power Dissipation	P_D	$T_A=25^\circ C$	223
		Derate above $25^\circ C$	1.8
Operating and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	$^\circ C$
Typical Thermal Junction to Ambient	Re_{JA}	560	$^\circ C/W$

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	-	0.10
A2	0.60	0.80
A3	0.45	0.65
b	0.15	0.30
C	0.10	0.20
D	1.50	1.70
E	1.45	1.75
E1	0.75	0.85
e	0.50 BSC	
e1	0.90	1.10
L	0.20	0.40
a	0°	8°



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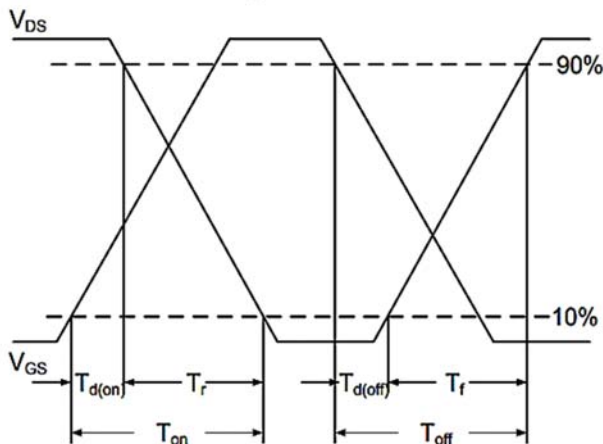
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	50	--	--	V
Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=50V$	I_{DSS}	--	--	1	μA
Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	--	--	± 10	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain Source On-Resistance	$V_{GS}=10V, I_D=500mA$	$R_{DS(ON)}$	--	0.96	1.6	Ω
	$V_{GS}=4.5V, I_D=200mA$		--	1.25	2.5	Ω
	$V_{GS}=2.5V, I_D=100mA$		--	2.73	4.5	Ω
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	0.8	1.0	1.5	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{GS}=4.5V, V_{DS}=25V, I_D=250mA$	Q_g	--	0.63	1	nC
Gate-Source Charge		Q_{gs}	--	0.2	--	
Gate-Drain Charge		Q_{gd}	--	0.23	--	
Input Capacitance	$V_{GS}=0V, V_{DS}=25V, f=1MHz$	C_{iss}	--	25	50	pF
Output Capacitance		C_{oss}	--	9.5	20	
Reverse Transfer Capacitance		C_{rss}	--	2.1	5	
Turn-On Delay Time	$V_{GS}=10V, V_{DD}=25V, I_D=500mA, R_G=6\Omega$	$t_{d(on)}$	--	2.2	5	nS
Rise Time		t_r	--	19.2	38	
Turn-Off Delay Time		$t_{d(off)}$	--	6.2	12	
Fall Time		t_f	--	23	50	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Maximum Continuous Drain-Source Forward Current	--	I_S	--	--	500	mA
Diode Forward Voltage	$V_{GS}=0V, I_S=500mA$	V_{SD}	--	0.86	1.5	V

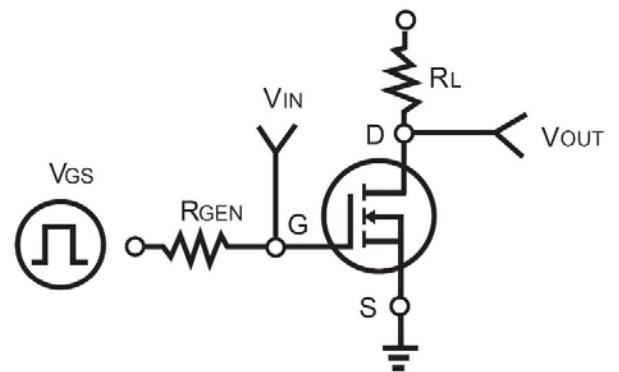
Note:

1. Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature.
3. $R_{\theta JA}$ 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.
4. The maximum current rating is package limited.
5. Guarantee by design, not test in mass production.

Switching Time Waveform



Switching Test Circuit



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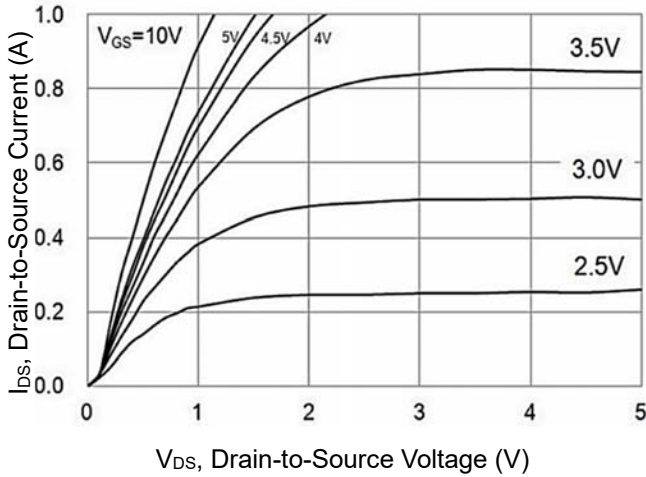
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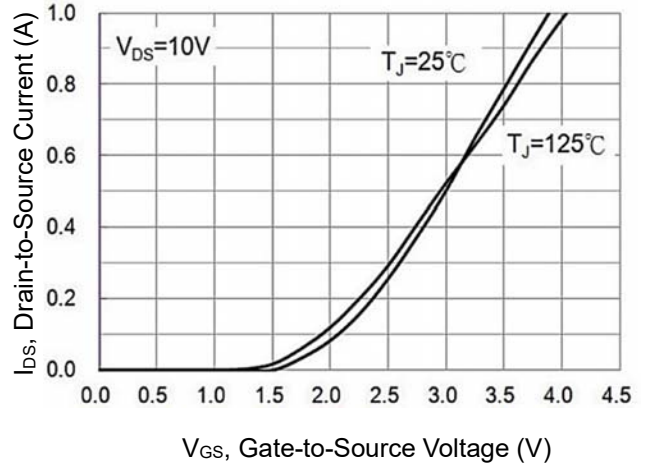
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CHARACTERISTIC CURVES

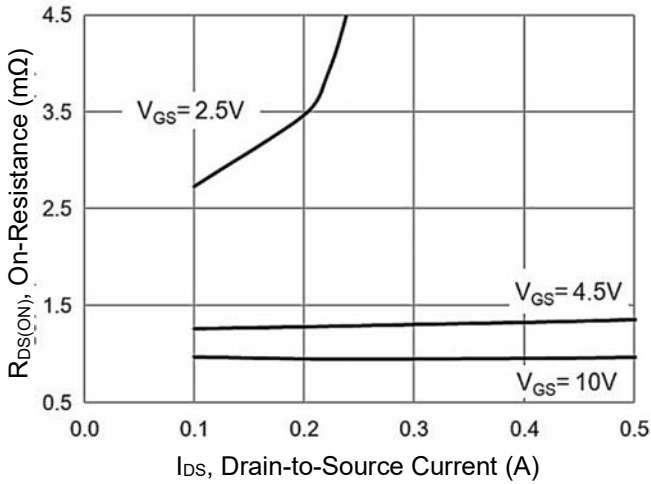
On-Region Characteristics



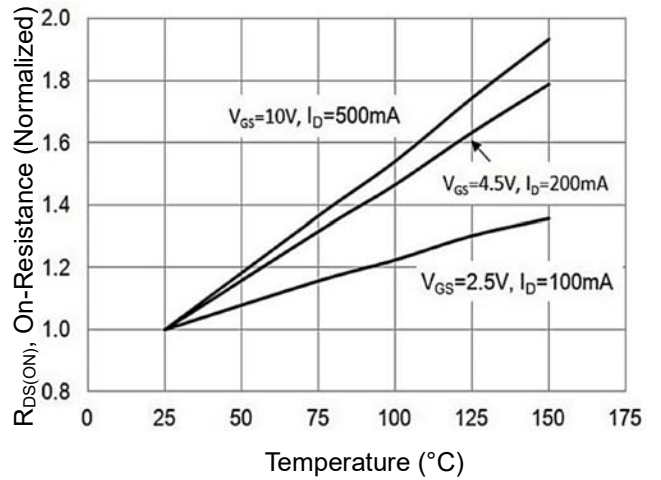
Transfer Characteristics



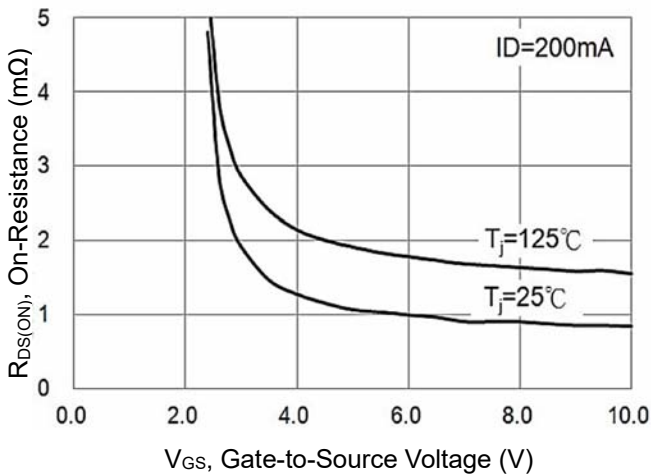
On-Resistance vs Drain Current



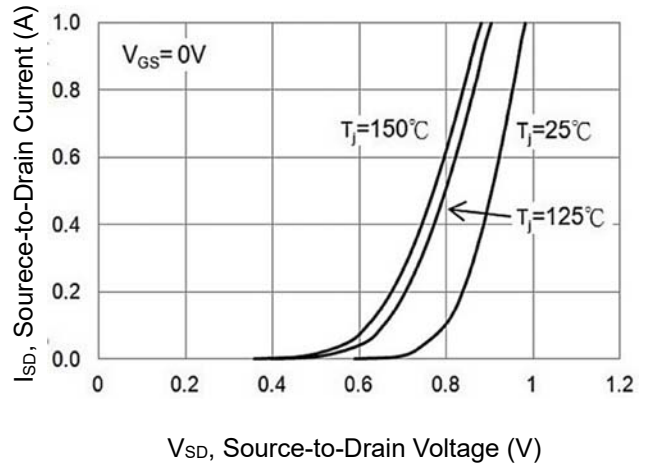
On-Resistance vs Junction Temperature



On-Resistance Variation with VGS



Body Diode Characteristics

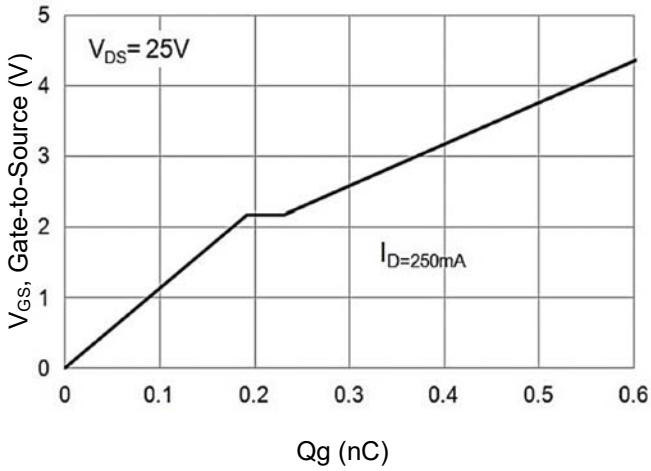


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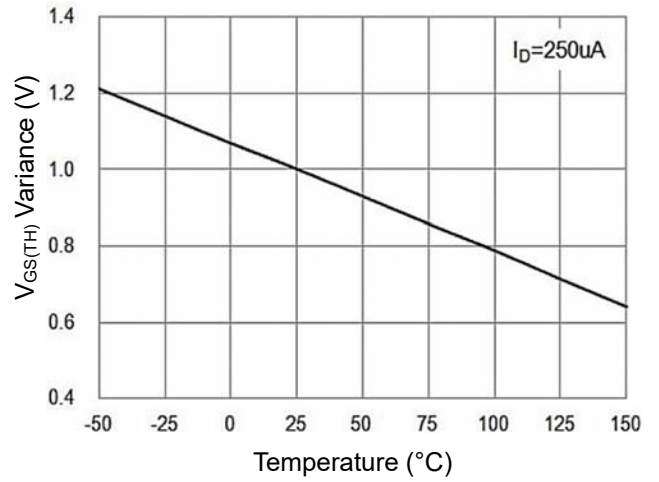
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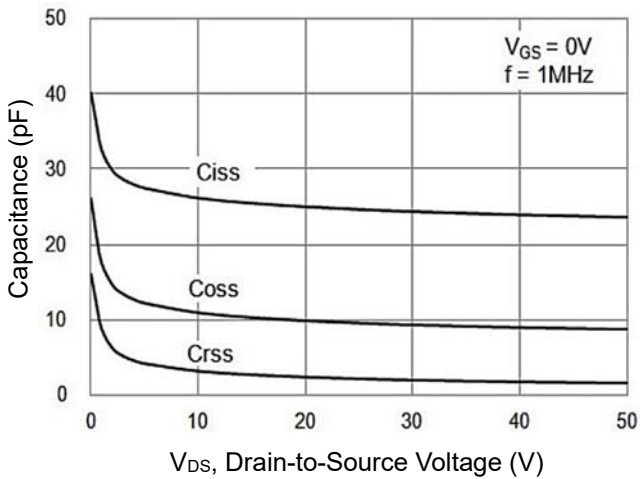
Gate-Charge Characteristics



Thershold Voltage Variation with Temperature



Capacitance vs Drain-Source Voltage



Breakdown Voltage vs Junction Temperature

