

N-Channel MOSFET

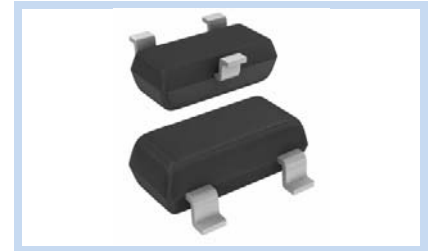
20V 2.2A SOT-323

MFT6NA20S323E

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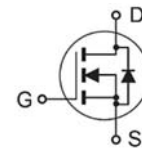
FEATURE

- $R_{DS(ON)} = 45m\Omega$, V_{GS} at 4.5V, I_D at 2.2A
- $R_{DS(ON)} = 55m\Omega$, V_{GS} at 2.5V, I_D at 2.2A
- $R_{DS(ON)} = 80m\Omega$, V_{GS} at 1.8V, I_D at 2.2A
- High dense cell design for extremely low $R_{DS(ON)}$
- Rugged and reliable



MECHANICAL DATA

- Case: SOT-323 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

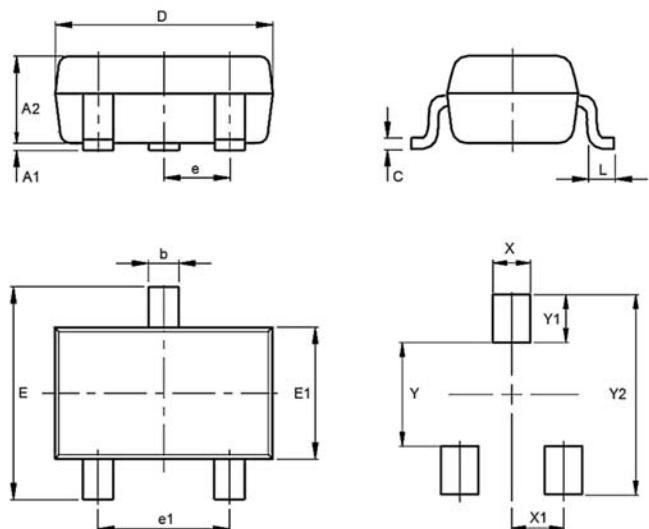


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current – Continuous	I_D	2.2	mA
Drain Current – Pulsed	I_{DM}	8.8	mA
Power Dissipation	P_D	0.35	mW
Operating Junction Temperature Range	T_J, T_{stg}	-55 to 150	$^{\circ}C$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	360	$^{\circ}C/W$

DIMENSIONS

SOT-323	Min (mm)	Max (mm)
A1	-	0.10
A2	0.90	1.10
b	0.20	0.40
C	0.05	0.15
D	1.80	2.20
e	0.60	0.70
e1	1.20	1.40
E	2.00	2.20
E1	1.15	1.35
L	-	0.15
X	0.66	
X1	0.65	
Y	0.99	
Y1	0.86	
Y2	1.85	



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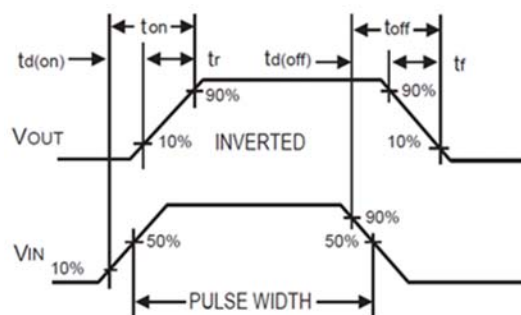
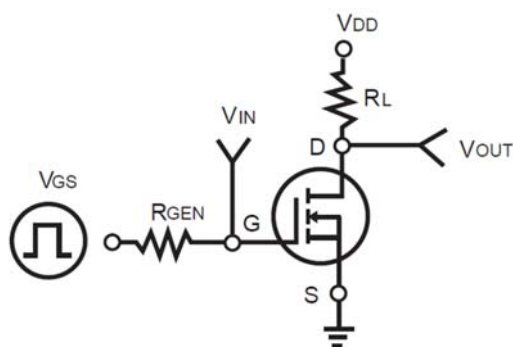
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ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	20	-	-	V
Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Gate Leakage Current, Forward	$V_{DS}=0V, V_{GS}=12V$	I_{GSSF}	-	-	100	nA
Gate Leakage Current, Reverse	$V_{DS}=0V, V_{GS}=-12V$	I_{GSSR}	-	-	-100	
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	0.4	-	1	V
Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=1A$	$R_{DS(on)}$	-	32	45	m Ω
	$V_{GS}=2.5V, I_D=1A$		-	39	55	
	$V_{GS}=1.8V, I_D=1A$		-	51	80	
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=10V,$ $V_{GS}=4.5V,$ $I_D=2A$	Q_g	-	4.7	-	nC
Gate-Source Charge		Q_{gs}	-	0.4	-	
Gate-Drain Charge		Q_{gd}	-	1.2	-	
Input Capacitance	$V_{DS}=10V,$ $V_{GS}=0V,$ $F=1.0MHz$	C_{iss}	-	470	-	pF
Output Capacitance		C_{oss}	-	85	-	
Reverse Transfer Capacitance		C_{rss}	-	50	-	
Turn-On Delay Time	$V_{DD}=10V,$ $I_D=2A$ $R_G=6\Omega,$ $V_{GS}=4.5V$	$T_{d(on)}$	-	10	-	nS
Rise Time		T_r	-	5	-	
Turn-Off Delay Time		$T_{d(off)}$	-	36	-	
Fall Time		T_f	-	9	-	
Static Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	-	I_S	-	-	0.29	A
Diode Forward Voltage	$I_S=1A, V_{GS}=0V$	V_{SD}	-	-	1.2	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 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 square pad of copper
4. Guaranteed by design, not test in mass production



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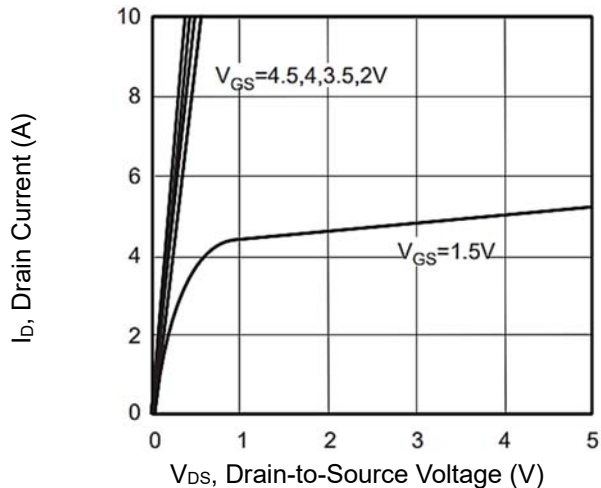
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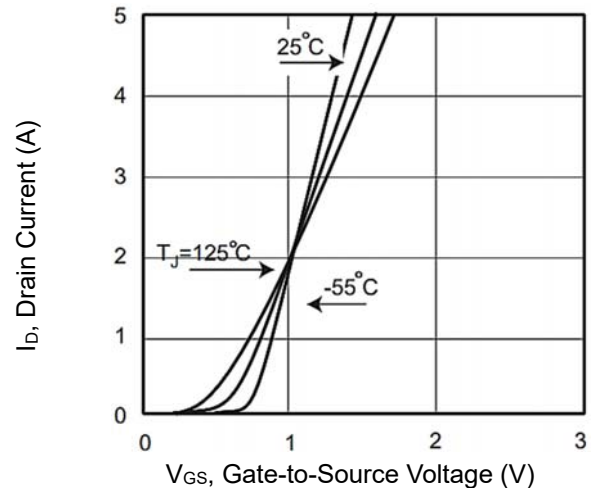
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CHARACTERISTIC CURVES

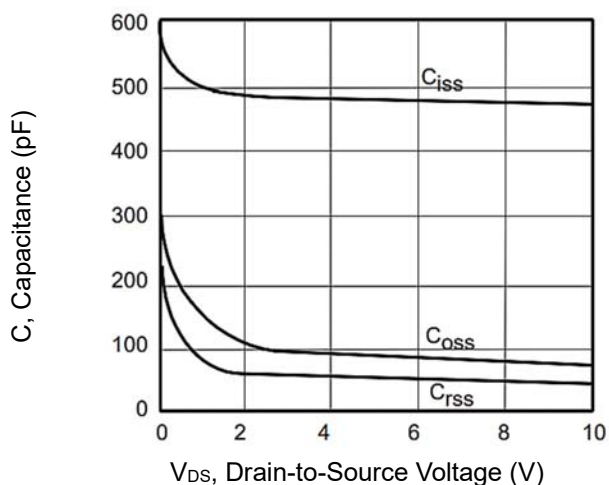
Output Characteristics



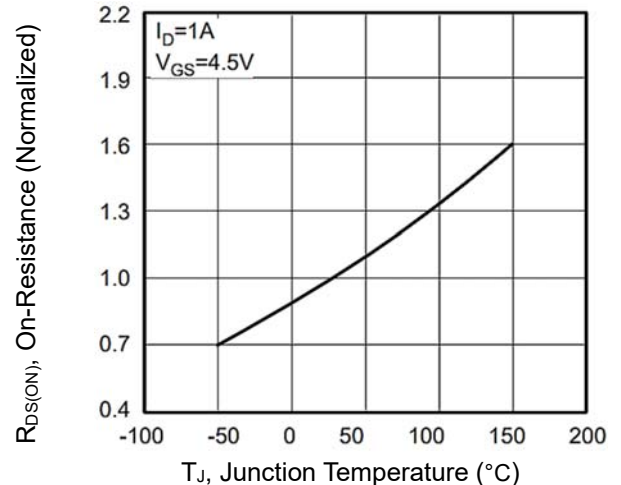
Transfer Characteristics



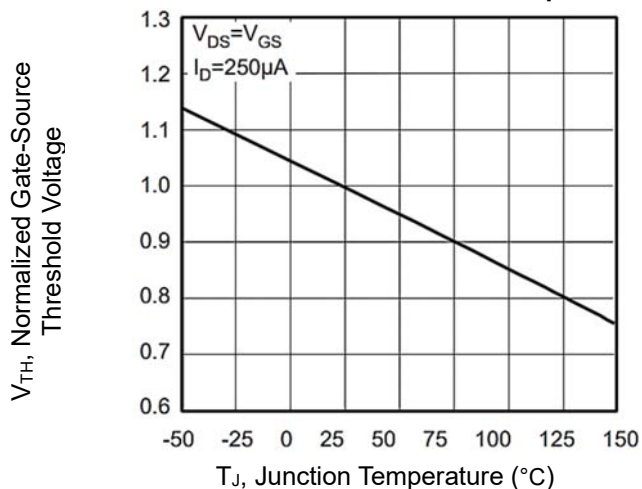
Capacitance



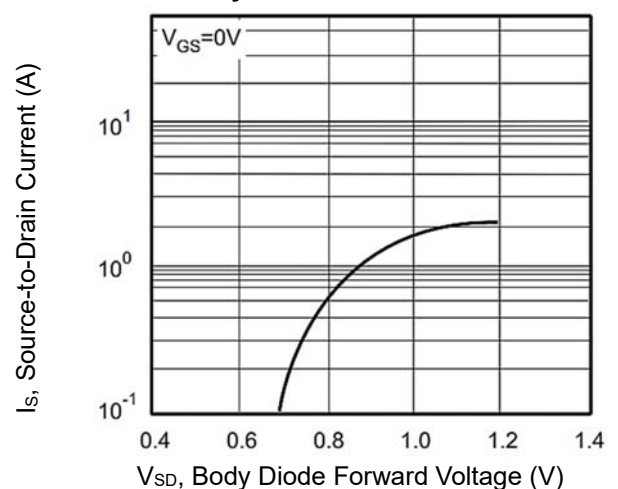
On-Resistance vs. Junction temperature



Gate Threshold Variation with Temperature



Body Diode Characteristics



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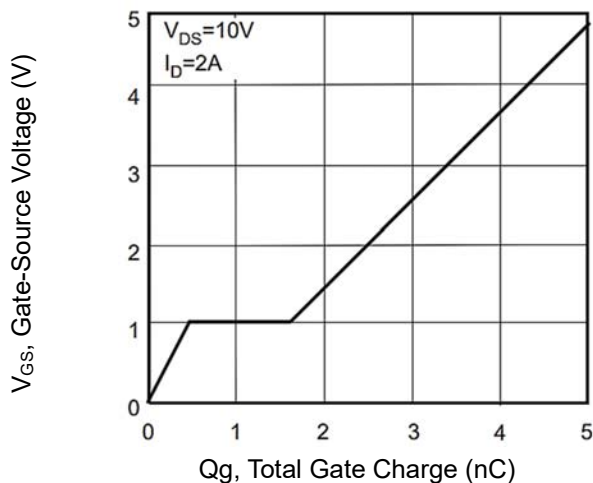
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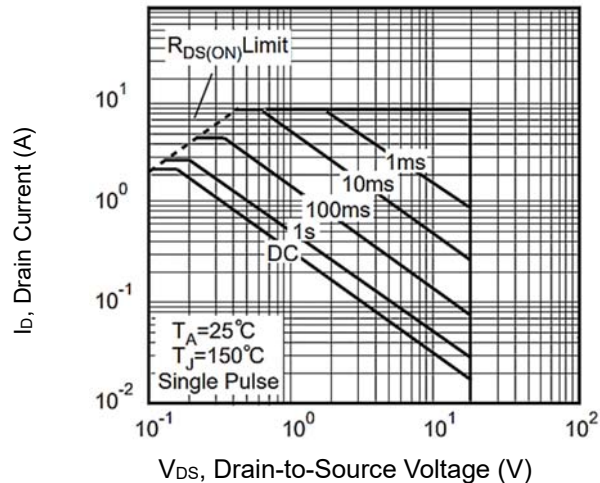
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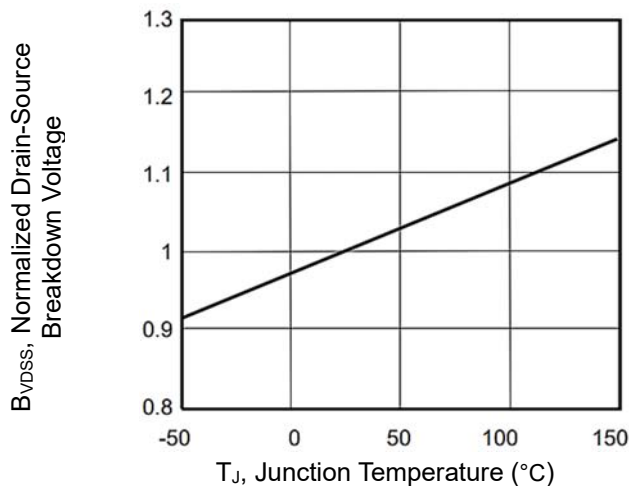
Gate-Charge Characteristics



Maximum Safe Operating Area



Breakdown Voltage Variation with Temperature



Normalized Thermal Transient Impedance Curve

