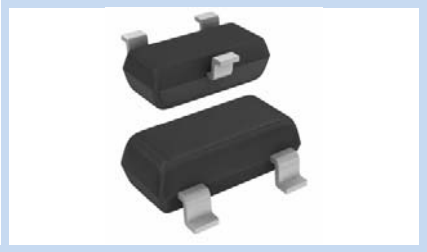
N-Channel MOSFET
60V 200mA 350mW SOT-323

MFT6NA20S323E

MERITEK

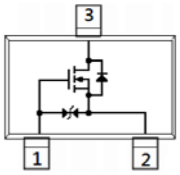
FEATURE

- $R_{DS(ON)}$<4.2Ω, V_{GS}=10V, I_D=200mA
- $R_{DS(ON)}$<5.0Ω, V_{GS}=4.5V, I_D=100mA
- $R_{DS(ON)}$<7.0Ω, V_{GS}=2.5V, I_D=50mA
- Advanced Trench Process Technology
- ESD Protected



MECHANICAL DATA

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



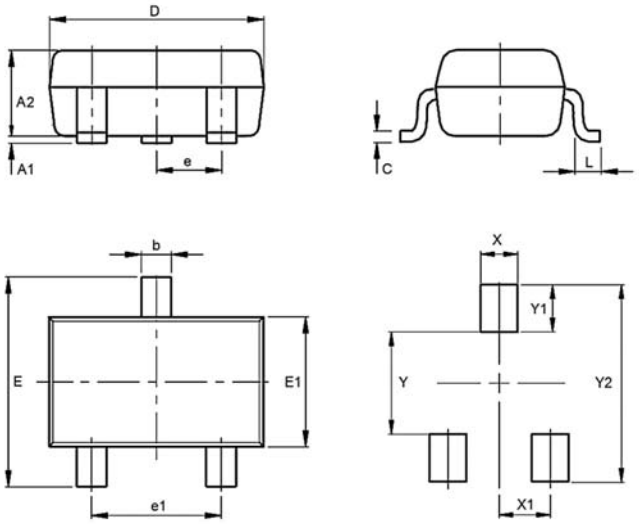
RoHS

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous		I_D	200	mA
Drain Current – Pulsed		I_{DM}	1000	mA
Power Dissipation	T_a=25°C	P_D	350	mW
	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)
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	

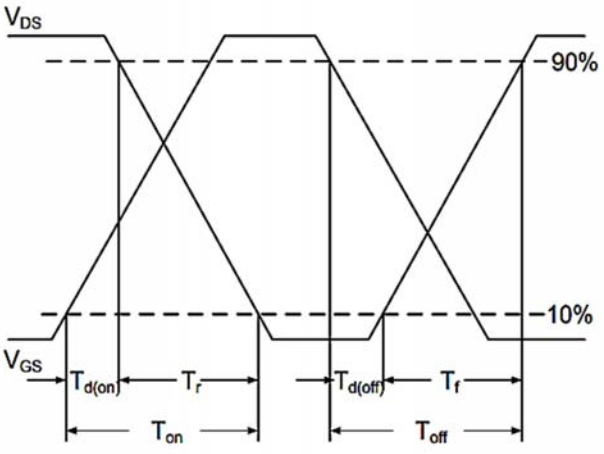


ELECTRICAL CHARACTERISTICS

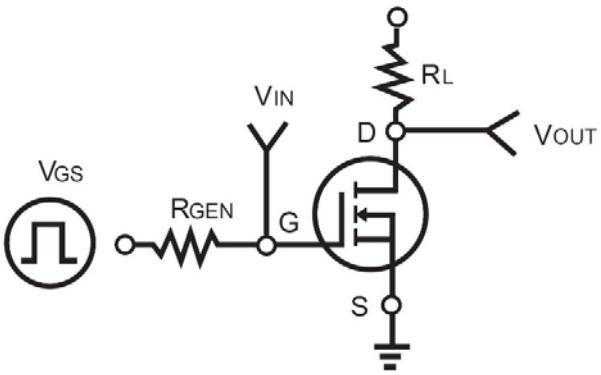
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= 250uA	BV_{DSS}	60	-	-	V
Zero Gate Voltage Drain Current	V_{DS}= 60V, V_{GS}=0V	I_{DSS}	-	0.01	1	μA
Gate Leakage Current	V_{DS}= 0V, V_{GS}= ±20V	I_{GSS}	-	±1.0	±10	μA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D= 250uA	$V_{GS(th)}$	0.8	1.2	1.5	V
Drain-Source On-Resistance	V_{GS}=10V, I_D= 200mA	$R_{DS(ON)}$	-	2.5	4.2	Ω
	V_{GS}= 4.5V, I_D= 100mA		-	2.8	5	
	V_{GS}= 2.5V, I_D= 50mA		-	3.7	7	
	V_{GS}= 1.8V, I_D= 50mA		-	12	-	
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}= 15V, V_{GS}= 4.5V, I_D= 200mA	Q_g	-	0.7	-	nC
Gate-Source Charge		Q_{gs}	-	0.33	-	
Gate-Drain Charge		Q_{gd}	-	0.2	-	
Input Capacitance	V_{DS}= 15V, V_{GS}=0V, F=1.0MHz	C_{iss}	-	15	-	pF
Output Capacitance		C_{oss}	-	8.4	-	
Reverse Transfer Capacitance		C_{rss}	-	4.2	-	
Turn-On Delay Time	V_{DD}= 10V, I_D= 200mA V_{GS}=10V, R_G= 6Ω	$T_{d(on)}$	-	7	-	nS
Rise Time		T_r	-	22	-	
Turn-Off Delay Time		$T_{d(off)}$	-	21	-	
Fall Time		T_f	-	25	-	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Current	-	I_S	-	-	200	mA
Diode Forward Voltage	I_S=200mA, V_{GS}=0V	V_{SD}	-	0.8	1.1	V

Note:
1. Pulse width≤ 300μs, duty cycle≤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 tested in mass production

Switching Time Waveform

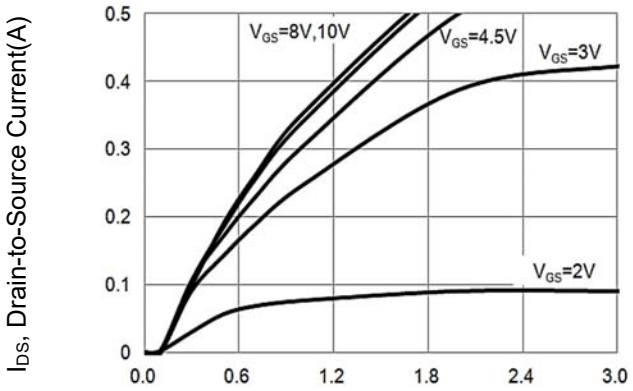


Switching Test Circuit

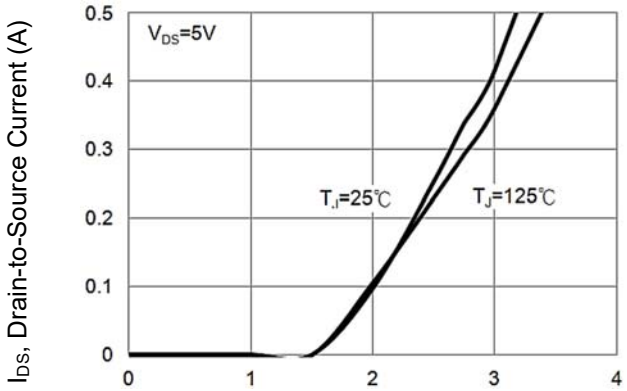


CHARACTERISTIC CURVES

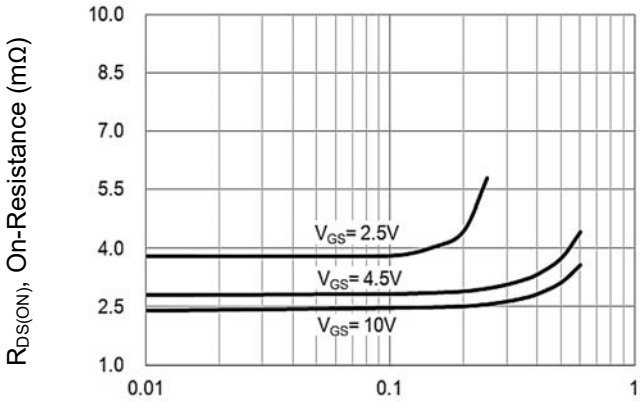
On-Region Characteristics



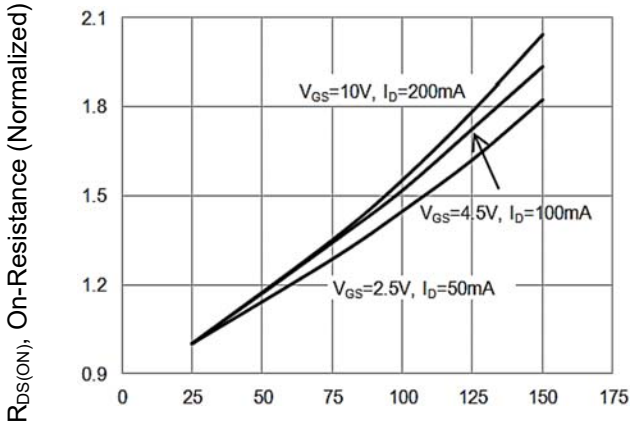
Transfer Characteristics



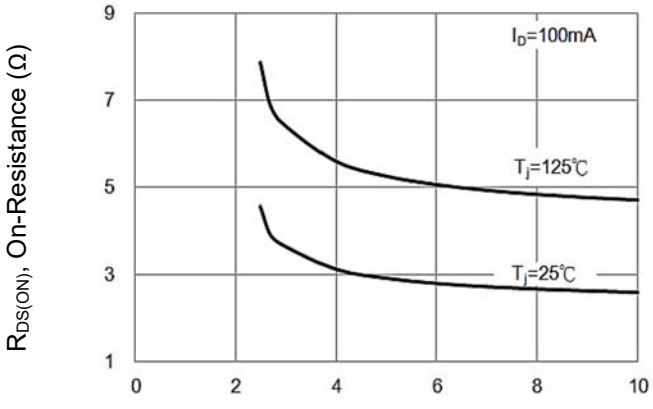
On-Resistance vs. Drain Current



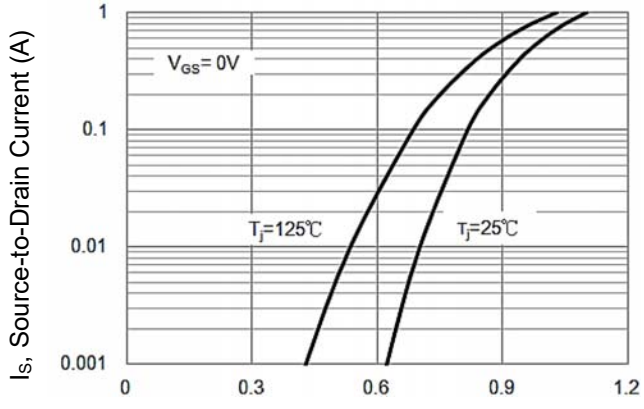
On-Resistance vs. Junction temperature



On-Resistance Variation with VGS

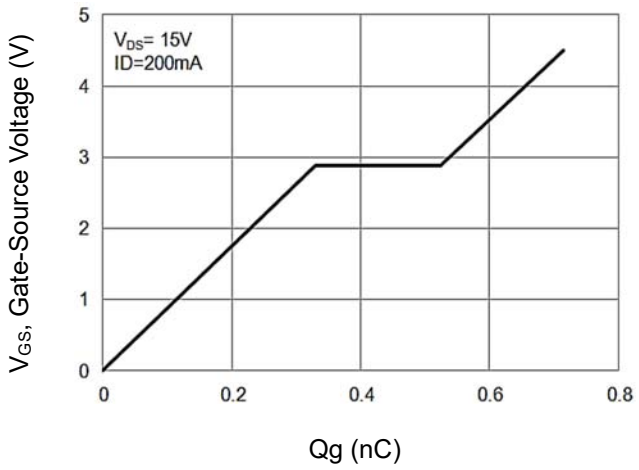


Body Diode Characteristics

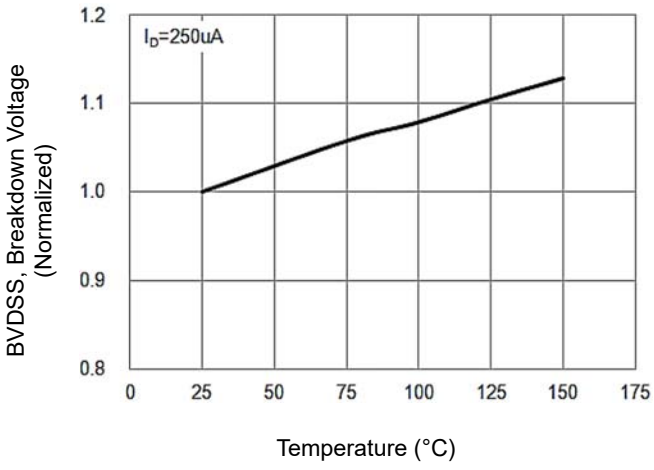


CHARACTERISTIC CURVES

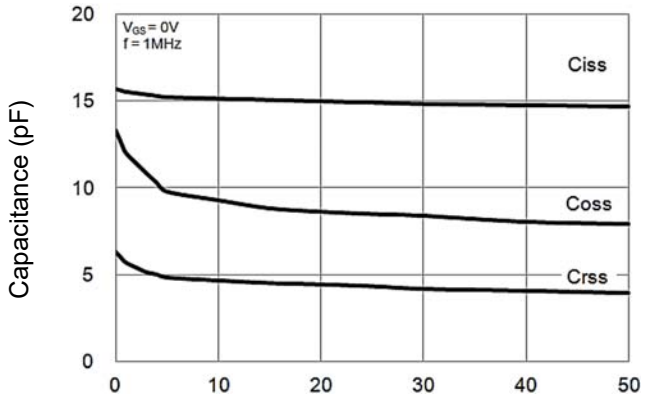
Gate-Charge Characteristics



Threshold Voltage Variation with Temperature



Capacitance vs. Drain-Source Voltage



Threshold Voltage Variation with Temperature