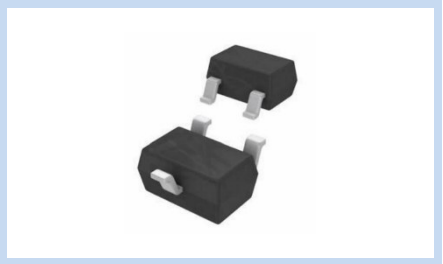
N-Channel MOSFET
60V 0.3A SOT-323 ESD AEC-Q101

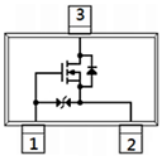
MFT6NA30S323EA

MERITEK

FEATURE



- $R_{DS(ON)}$ <3Ω at V_{GS}=10V
- $R_{DS(ON)}$ <4Ω at V_{GS}=4.5V
- Low Gate Threshold Voltage
- Low On-Resistance
- Low Input Capacitance
- ESD Protected Gate
- Application: Battery Operated Systems, Solid-State Relays, Displays, Lamps, Solenoids, and Memories
- AEC-Q101 Compliant



RoHS

MECHANICAL DATA

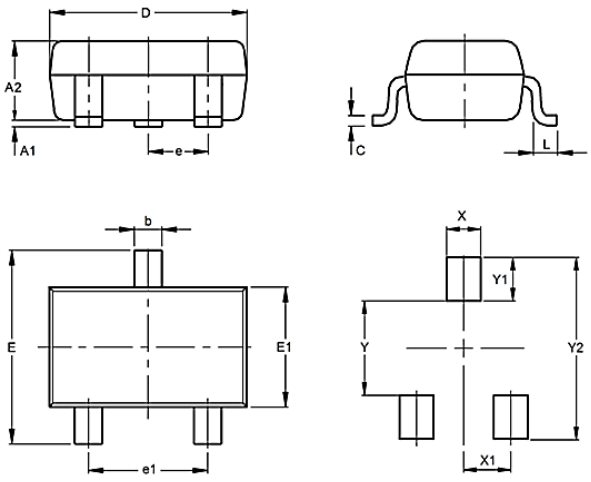
- Case: SOT-323 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter, T_A=°25C		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous		I_D	300	mA
Drain Current – Pulsed	t_P ≤ 10μs	I_{DM}	800	mA
Power Dissipation		P_D	200	mW
Typical Thermal Resistance	Junction to Ambient	$R_{\theta JA}$	625	°C / W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	--	0.10
A2	0.70	1.00
b	0.20	0.40
c	0.05	0.25
D	1.80	2.20
e	0.65 TYP	
e1	1.20	1.40
E	2.00	2.40
E1	1.15	1.35
L	0.10	--

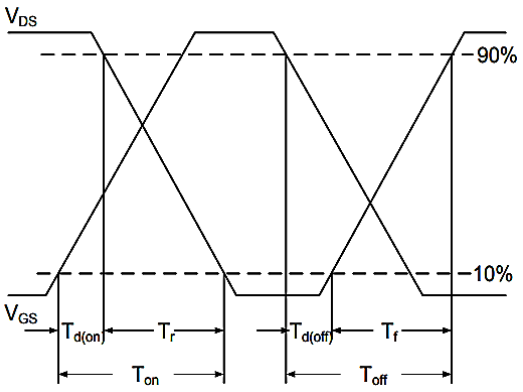


ELECTRICAL CHARACTERISTICS

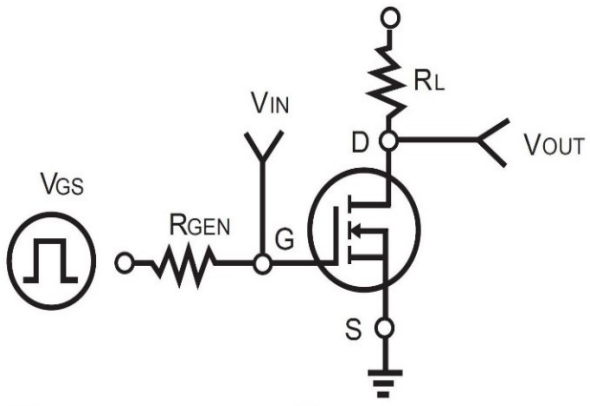
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= 10μA	BV_{DSS}	60	--	--	V
Gate Threshold Voltage	V_{DS}=10V, I_D= 250μA	$V_{GS(th)}$	1.0	--	2.5	V
Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	--	--	±10	μA
Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V	I_{DSS}	--	--	1	μA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}= 10V, I_D= 500mA	$R_{DS(ON)}$	--	--	3	Ω
	V_{GS}= 4.5V, I_D= 200mA		--	--	4	
Forward Transconductance	V_{DS}=10V, I_D= 200mA	g_{FS}	80	--	--	mS
Dynamic Characteristics	**Conditions**	**Symbol**	**--**	**Typ.**	**Max**	**Unit**
Gate Resistance	V_{GS}= 0V, V_{DS}= 0V, F=1.0MHz	R_g	--	200	--	Ω
Input Capacitance	V_{DS}= 25V, V_{GS}= 0V, F=1.0MHz	C_{iss}	--	22.5	50.0	pF
Output Capacitance		C_{oss}	--	12.0	25.0	
Reverse Transfer Capacitance		C_{rss}	--	0.5	10.0	
Turn-On Delay Time	V_{DS}= 30V, I_D= 500mA, V_{GS}=10V, R_g= 25Ω	$T_{d(on)}$	--	2.7	--	nS
Rise Time		T_r	--	2.5	--	
Turn-Off Delay Time		$T_{d(off)}$	--	13.0	--	
Fall Time		T_f	--	8.0	--	
Total Gate Charge	V_{DS}= 10V, V_{GS}= 4.5V, I_D= 500mA	Q_g	--	0.44	--	nC
Gate-Source Charge		Q_{gs}	--	0.20	--	
Gate-Drain Charge		Q_{gd}	--	0.10	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	I_S=500mA,V_{GS}=0V	V_{SD}	--	0.85	--	V
Diode Continuous Source Current	--	I_S	--	--	0.3	A
Reverse Recovery Time	I_S=500mA, dI/dt=100A/μs	t_{rr}	--	30	--	nS
Reverse Recovery Charge		Q_{rr}	--	29	--	nC

Note: Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.

Switching Time Waveform

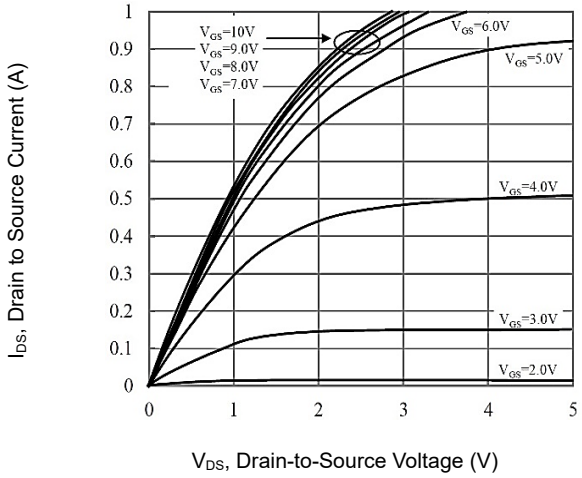


Switching Test Circuit

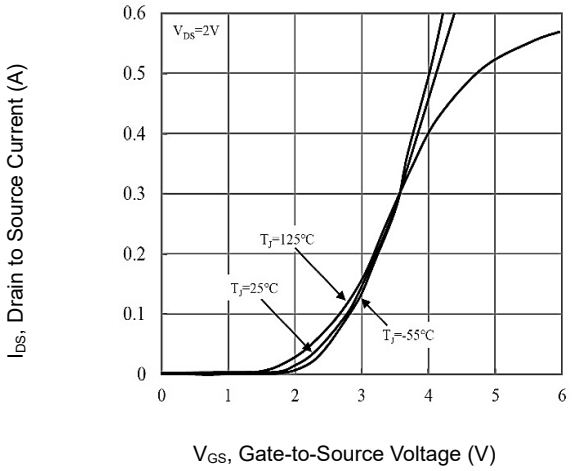


CHARACTERISTIC CURVES

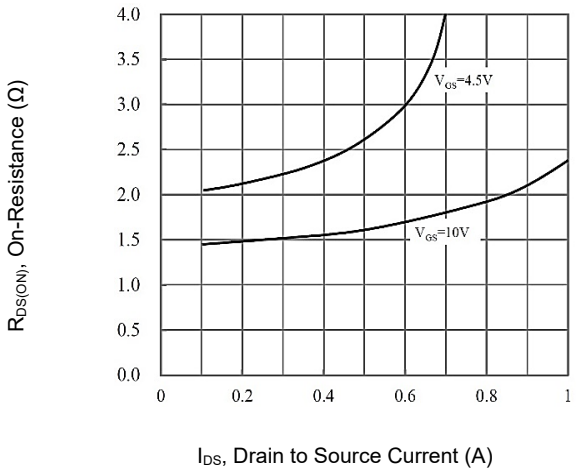
On Region Characteristics



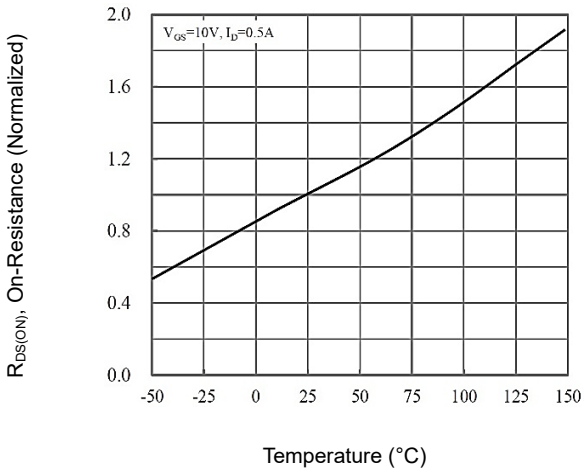
Transfer Characteristics



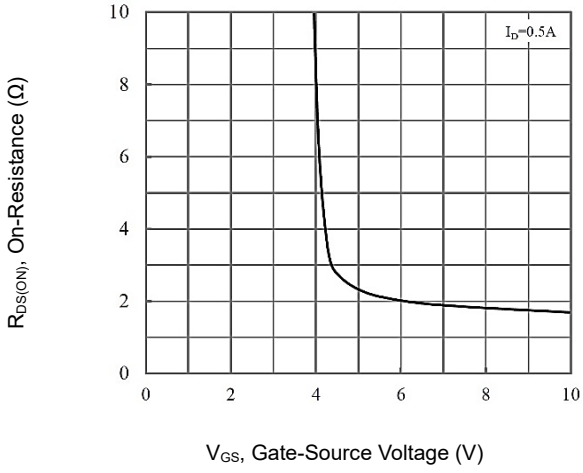
On-Resistance vs. Drain Current



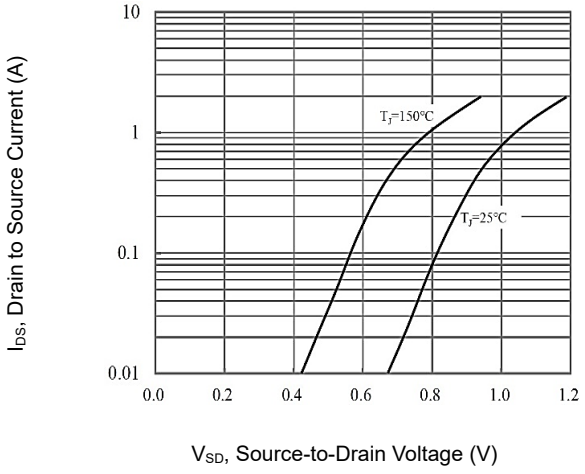
On-Resistance vs. Junction Temperature



On-Resistance Variation with V_{GS}

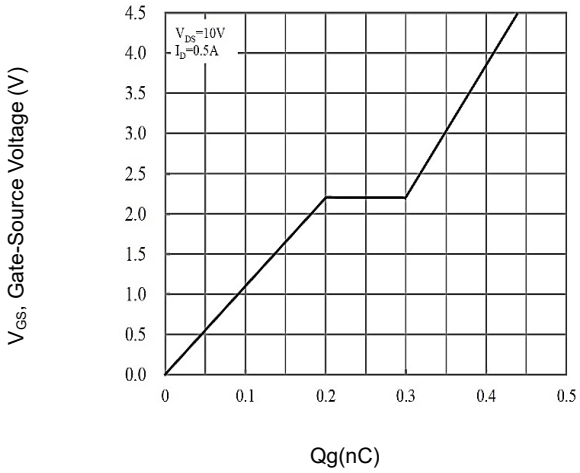


Body Diode Characteristics

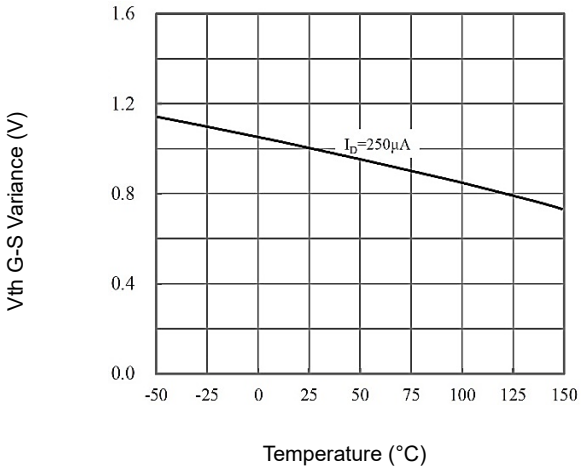


CHARACTERISTIC CURVES

Gate Charge Characteristics



Threshold Voltage Variance vs. Temperature



Capacitance vs. Drain-Source Voltage