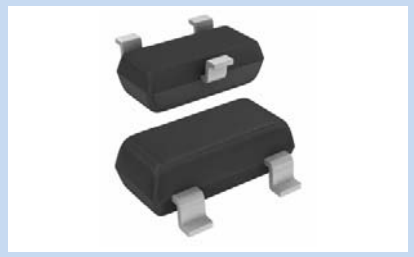
N-Channel MOSFET
20V 4.2A SOT-23

MFT2N4A2S23

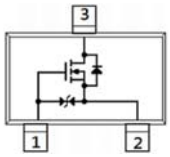
MERITEK

FEATURE



- $R_{DS(ON)}$ =45mΩ, V_{GS} at 4.5V, I_D at 4.2A
- $R_{DS(ON)}$ =80mΩ, V_{GS} at 2.5V, I_D at 4.2A
- High dense cell design for extremely low $R_{DS(ON)}$
- Lead free product is acquired
- Rugged and reliable

MECHANICAL DATA



RoHS

- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

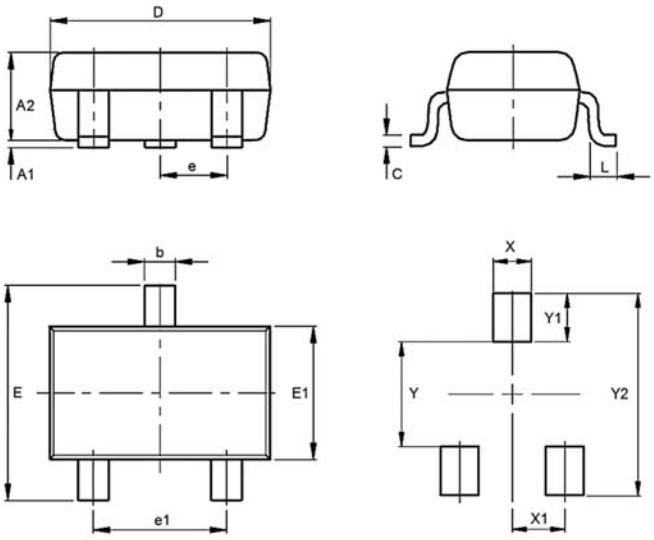
MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current – Continuous	I_D	4.2	A
Drain Current – Pulsed	I_{DM}	16	A
Power Dissipation	P_D	1.25	W
Operating Junction Temperature Range	T_J,T_{stg}	-55 to 150	°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	100	°C/W

Note:
1. T_A=25˚C unless otherwise noted

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	0.00	0.10
A2	0.90	1.10
b	0.35	0.50
C	0.08	0.20
D	2.80	3.04
e	0.90	1.00
e1	1.80	2.00
E	2.20	2.60
E1	1.20	1.40
L	0.15	
X	0.80	
X1	0.95	
Y	1.10	
Y1	0.90	
Y2	2.90	

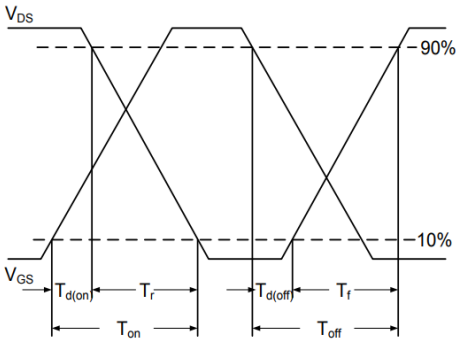


ELECTRICAL CHARACTERISTICS

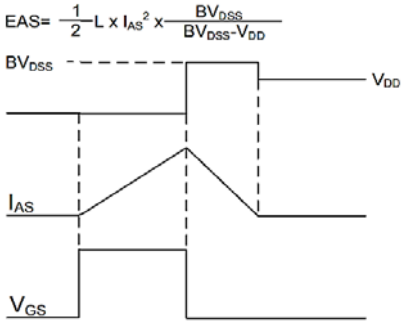
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= 10uA	BV_{DSS}	20	-	-	V
Zero Gate Voltage Drain Current	V_{DS}= 16V, V_{GS}=0V	I_{DSS}	-	-	1	μA
Gate Leakage Current, Forward	V_{DS}=0V, V_{GS}=12V	I_{GSSF}	-	-	100	nA
Gate Leakage Current, Reverse	V_{DS}=0V, V_{GS}=-12V	I_{GSSR}	-	-	-100	
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D= 250uA	$V_{GS(th)}$	0.5	-	1.5	V
Drain-Source On-Resistance	V_{GS}=4.5V, I_D=4.2A	$R_{DS(ON)}$	-	35	45	mΩ
	V_{GS}=2.5V, I_D=3.6A		-	50	80	
Forward Transconductance	V_{DS}=10V, I_D=4.0A	g_{FS}	-	8	-	S
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}= 10V, V_{GS}= 4.5V, I_D= 4.2A	Q_g	-	10	15	nC
Gate-Source Charge		Q_{gs}	-	2.3	-	
Gate-Drain Charge		Q_{gd}	-	2.9	-	
Input Capacitance	V_{DS}= 8V, V_{GS}=0V, F=1.0MHz	C_{iss}	-	500	-	pF
Output Capacitance		C_{oss}	-	300	-	
Reverse Transfer Capacitance		C_{rss}	-	140	-	
Turn-On Delay Time	V_{DD}= 10V, I_D= 1A R_G= 6Ω, V_{GS}=4.5V	$T_{d(on)}$	-	20	40	nS
Rise Time		T_r	-	18	40	
Turn-Off Delay Time		$T_{d(off)}$	-	2.3	108	
Fall Time		T_f	-	2.9	56	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Current	-	I_S	-	-	1.3	A
Diode Forward Voltage	I_S=1.3A, V_{GS}=0V	V_{SD}	-	-	1.2	V

Note:
1. Pulse width≤ 300μs, duty cycle≤2%
2. Essentially independent of operating temperature. $R_{\theta JA}$ 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
3. Guarantee by design,not test in mass production
4. T_C=25°C unless otherwise noted

Switching Time Waveform

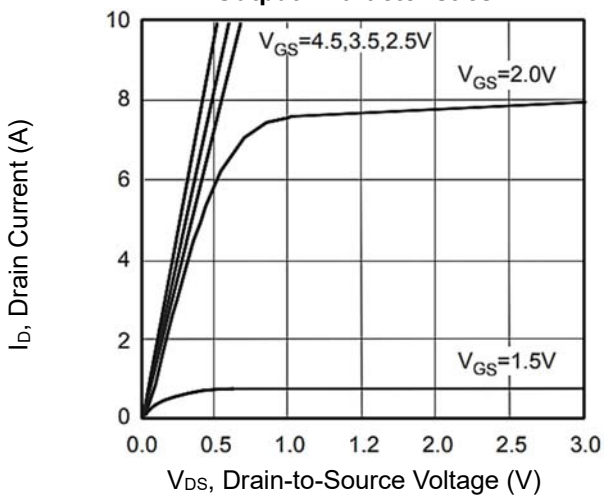


EAS Waveform

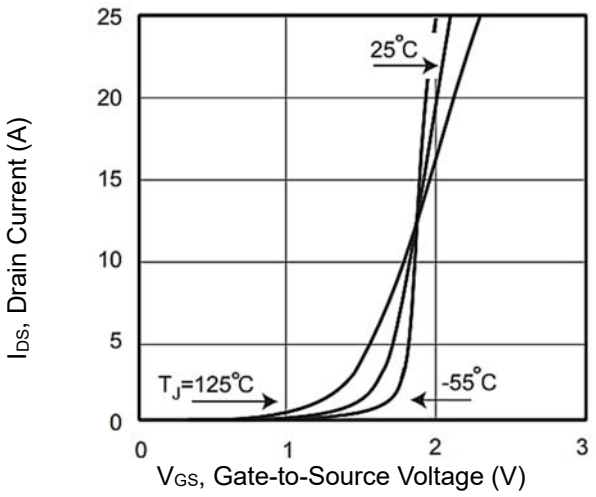


CHARACTERISTIC CURVES

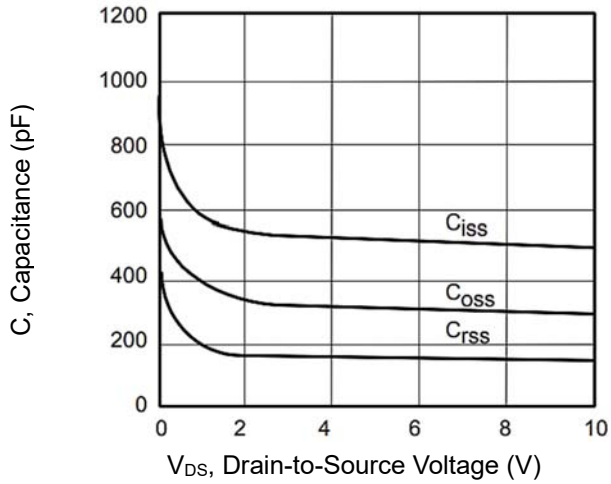
Output Characteristics



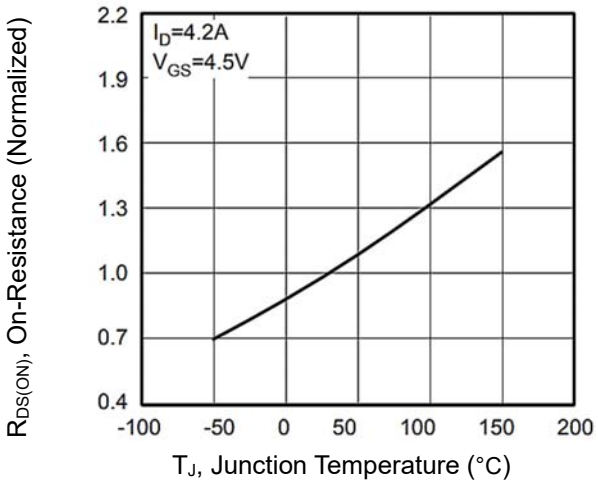
Transfer Characteristics



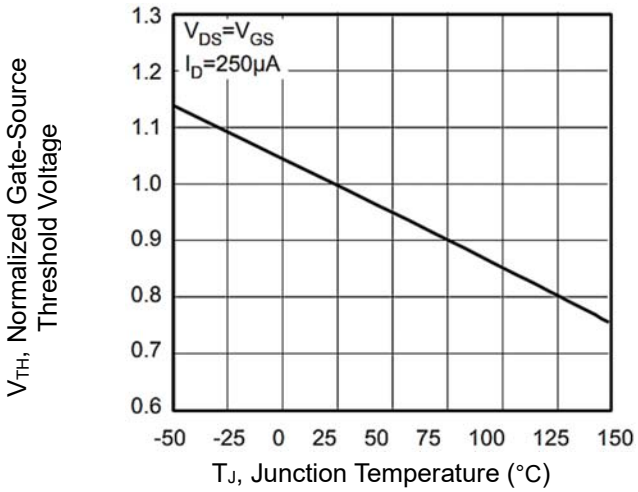
Capacitance



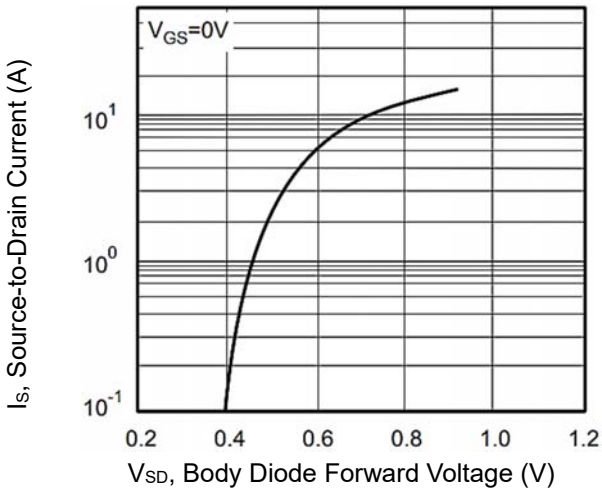
On-Resistance Variation with Temperature



Gate Threshold Variation with Temperature

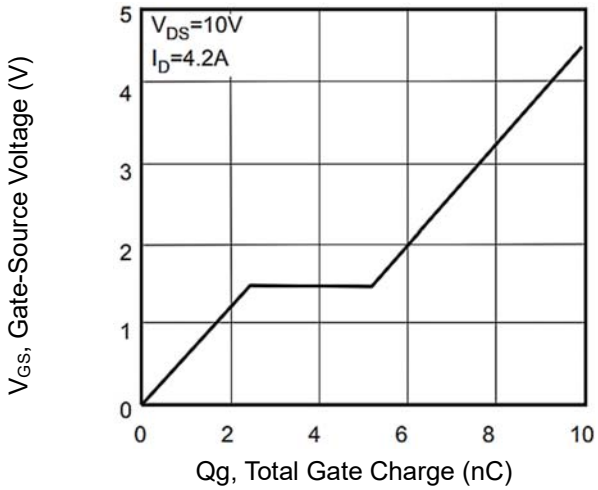


Body Diode Characteristics

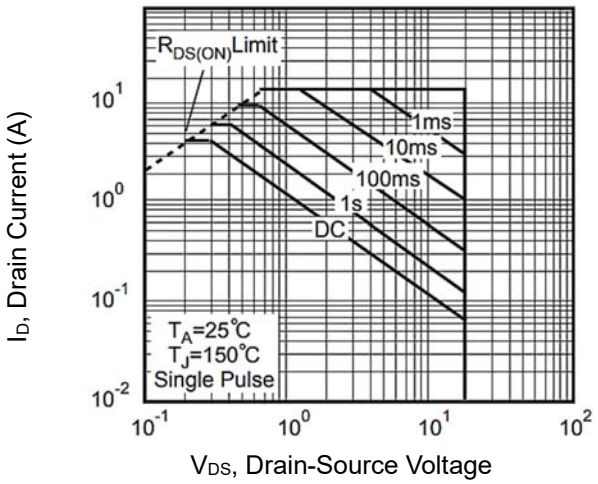


CHARACTERISTIC CURVES

Gate-Charge Characteristics



Maximum Safe Operating Area



Normalized Thermal Transient Impedance Curve