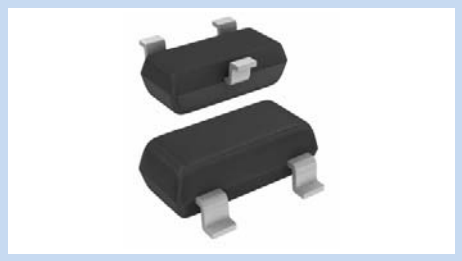
P-Channel MOSFET
-20V -3.1A 1.25W SOT-23

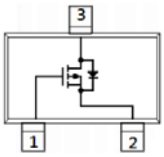
MFT2P3A1S23

MERITEK

FEATURE

- $R_{DS(ON)}$<100mΩ, V_{GS}=-4.5V, I_D=-3.1A
- $R_{DS(ON)}$<135mΩ, V_{GS}=-2.5V, I_D=-2.0A
- $R_{DS(ON)}$<190mΩ, V_{GS}=-1.8V, I_D=-1.1A
- Advanced Trench Process Technology
- Designed for Switch Load, PWM Application





RoHS

MECHANICAL DATA

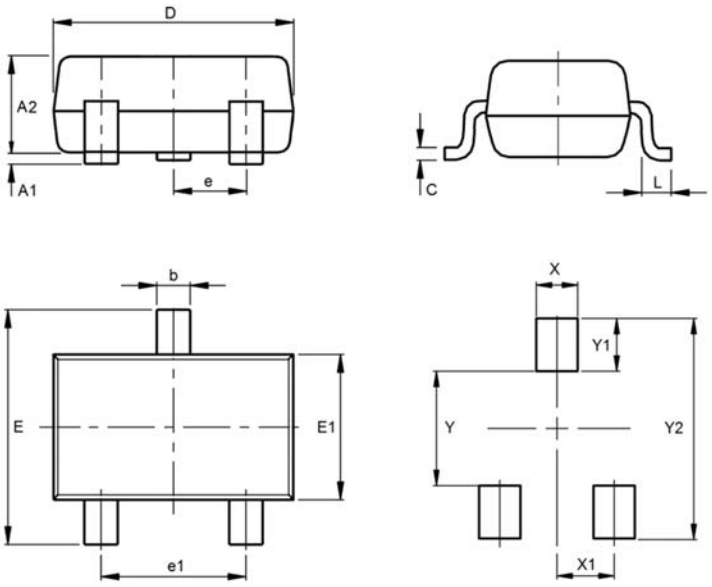
- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

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	-3.1	A
Drain Current – Pulsed		I_{DM}	-12.4	A
Power Dissipation	T_C= 25°C	P_D	1.25	W
	Derate above 25°C		10	mW/°C
Operating Junction Temperature Range		T_J,T_{stg}	-55 to 150	°C
Thermal Resistance, Junction-to-Ambient		$R_{\theta JA}$	100	°C/W

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	



P-Channel MOSFET
-20V -3.1A 1.25W SOT-23

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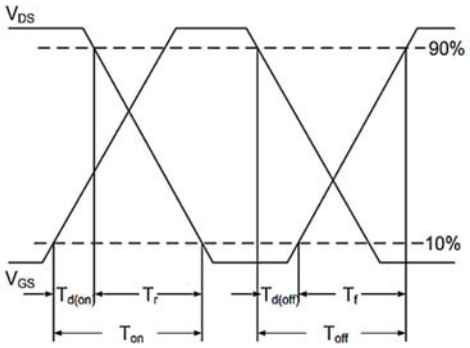
ELECTRICAL CHARACTERISTICS

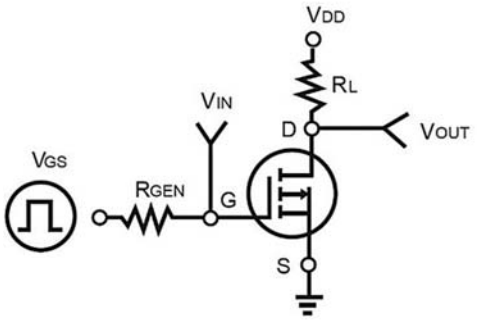
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	BV_{DSS}	-20	-	-	V
Zero Gate Voltage Drain Current	V_{DS}=-20V, V_{GS}=0V	I_{DSS}	-	-0.01	-1	μA
Gate Leakage Current	V_{DS}=0V, V_{GS}=±12V	I_{GSS}	-	±10	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=-250uA	$V_{GS(th)}$	-0.4	-0.71	-1.2	V
Drain-Source On-Resistance	V_{GS}=-4.5V, I_D=-3.1A	$R_{DS(ON)}$	-	84	100	mΩ
	V_{GS}=-2.5V, I_D=-2.0A		-	104	135	mΩ
	V_{GS}=-1.8V, I_D=-1.1A		-	134	190	mΩ
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=-10V, I_D=-3.1A V_{GS}=-4.5V,	Q_g	-	5.4	-	nC
Gate-Source Charge		Q_{gs}	-	0.7	-	nC
Gate-Drain Charge		Q_{gd}	-	1.3	-	nC
Input Capacitance	V_{DS}=-10V, V_{GS}=0V F=1.0MHz	C_{iss}	-	416	-	pF
Output Capacitance		C_{oss}	-	43	-	pF
Reverse Transfer Capacitance		C_{rss}	-	32	-	pF
Turn-On Delay Time	V_{DS}=-10V, I_D=-3.1A V_{GS}-4.5V, R_G=6Ω	$T_{d(on)}$	-	4	-	nS
Rise Time		T_r	-	27	-	nS
Turn-Off Delay Time		$T_{d(off)}$	-	78	-	nS
Fall Time		T_f	-	45	-	nS
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	I_S=-1.0A, V_{GS}=0V	V_{SD}	-	0.8	-1.2	V
Drain-Soure Diode Forward Current	---	I_S	-	-	-1.5	A

Note:
1. Pulse width≤ 300μs, duty cycle≤2%
2. Essentially independent of operating temperature typical characteristics
3. Re_{JA} is the sum of the junction to 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 FR-4 with 2oz. square pad of copper.
4. The maximum current rating is package limited.
5. Guaranteed by design, not subject to production testing.

Switching Time Waveform

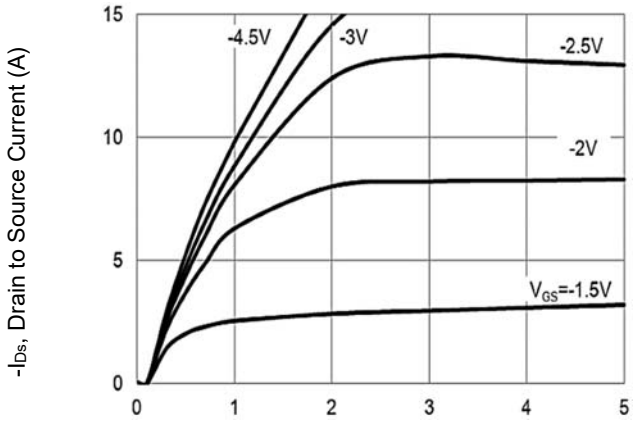


Switching Test Circuit

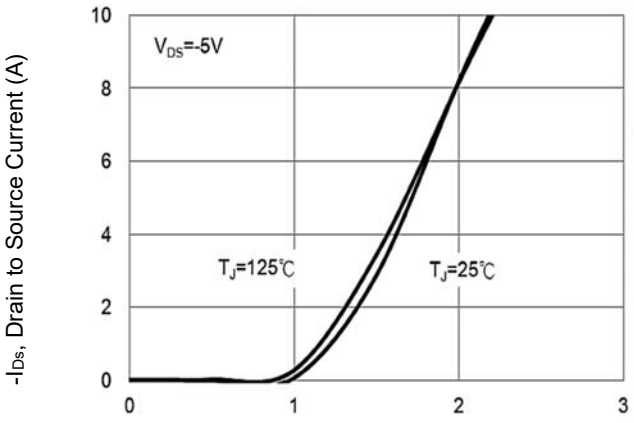


CHARACTERISTIC CURVES

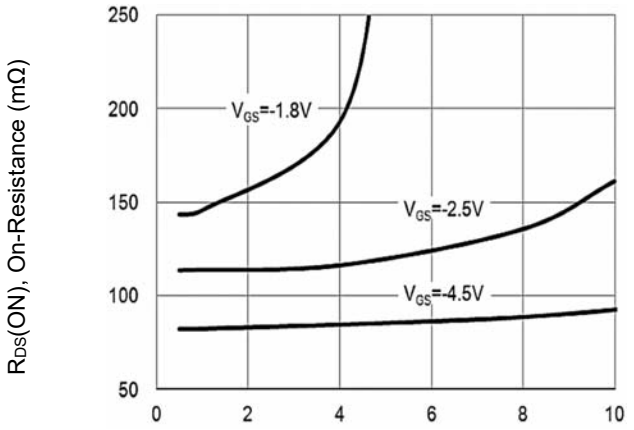
On-Region Chatacteristics



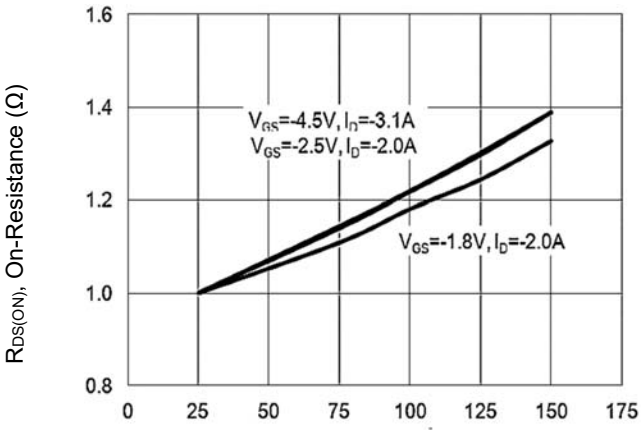
Transfer Characteristics



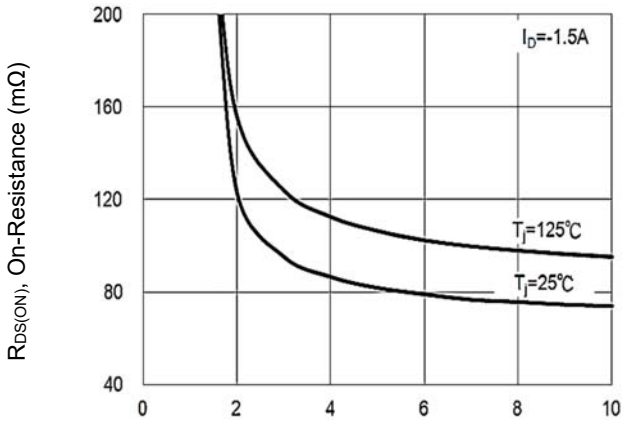
On-Resistance Variation vs. Drain Current



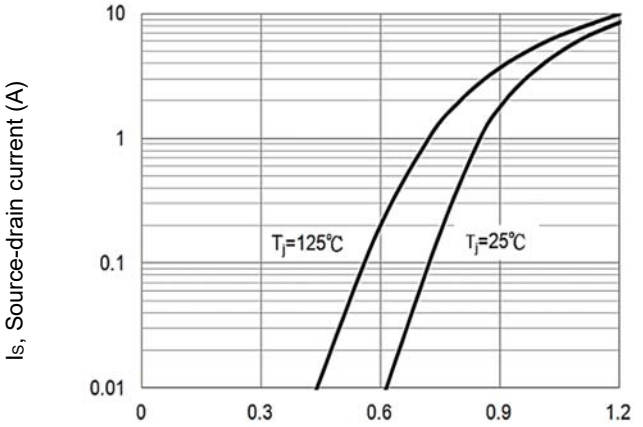
On-Resistance Variation vs. Junction Temperature



On-Resistance Variation vs. V_{GS}

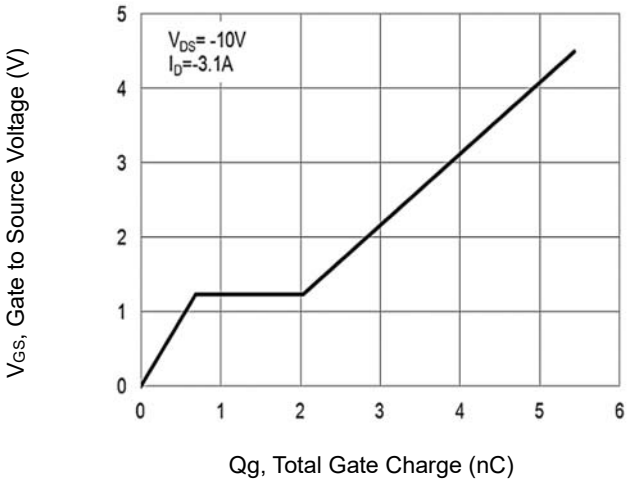


Body Diode Characteristics

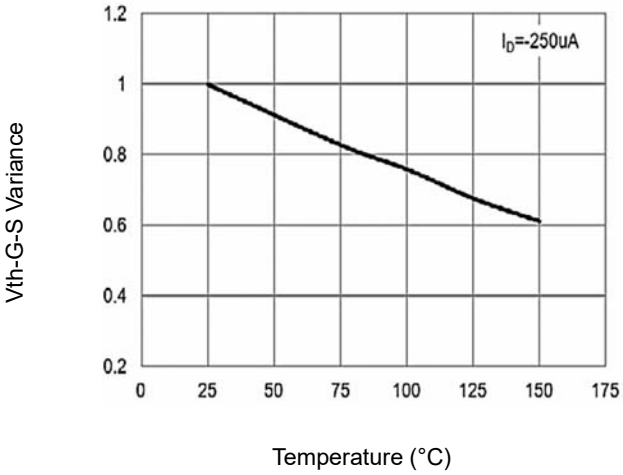


CHARACTERISTICS CURVES

Gate Charge Characteristics



Threshold Voltage Variation with Temperature



Capacitance vs. Drain Source Voltage