

P-Channel MOSFET -40V -3.1A SOT-23

MFT4P3A1S23

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FEATURE

- High dense cell design for extremely low RDS(ON)
- Exceptional on-resistance and maximum DC current capability
- Advanced Trench Process Technology
- Application: Switch Load, Pulse Width Modulation



MAXIMUM RATINGS

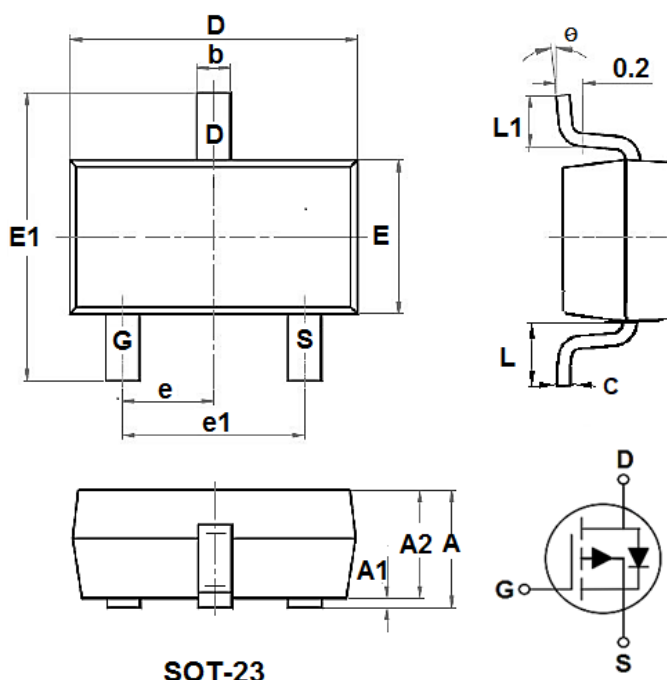
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	-3.1	A
Drain Current – Pulsed	I_{DM}	-12.4	A
Power Dissipation	P_D	$T_A=25^\circ\text{C}$	1.25
		Derate above $T_A=25^\circ\text{C}$	10
Operating Junction Temperature	T_J	-55 to 150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 150	$^\circ\text{C}$

Thermal RATINGS

Parameter	Symbol	Value	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	100	$^\circ\text{C} / \text{W}$

DIMENSIONS

Item	Min (mm)	Max (mm)
A	0.90	1.10
A1	0.00	0.10
A2	0.90	1.10
b	0.300	0.500
c	0.08	0.20
D	2.800	3.04
E	1.20	1.40
E1	2.250	2.550
e	0.950 TYP	
E1	2.250	2.550
L	0.550 REF	
L1	0.300	0.500
θ	0°C	8°C



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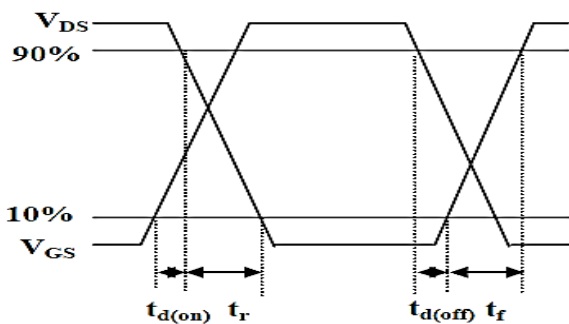
ELECTRICAL CHARACTERISTICS

Static Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D = -250\mu A$	BV_{DSS}	-40	--	--	V
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D = -250\mu A$	$V_{GS(th)}$	-1.0	-1.5	-2.5	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = -40V, V_{GS}=0V$	I_{DSS}	--	-0.01	-1	μA
Static Drain-Source On-Resistance	$V_{GS} = -10V, I_D = -3.1A$	$R_{DS(ON)}$	--	74	88	m Ω
	$V_{GS} = -4.5V, I_D = -2.6A$		--	88	108	
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Input Capacitance	$V_{DS} = -20V, V_{GS}=0V$ $F=1.0MHz$	C_{iss}	--	505	--	pF
Output Capacitance		C_{oss}	--	48	--	
Reverse Transfer Capacitance		C_{rss}	--	33	--	
Turn-On Delay Time	$V_{DD} = -20V, I_D \equiv -2.5A,$ $V_{GS} = -10V, R_G = 10\Omega$	$T_{d(on)}$	--	6.0	--	nS
Rise Time		T_r	--	35	--	
Turn-Off Delay Time		$T_{d(off)}$	--	18	--	
Fall Time		T_f	--	10	--	
Total Gate Charge	$V_{DS} = -20V, V_{GS} = -4.5V,$ $I_D \equiv -3.1A$	Q_g	--	6.0	--	nC
Gate-Source Charge		Q_{gs}	--	1.6	--	
Gate-Drain Charge		Q_{gd}	--	2.3	--	
Drain-Source Diode Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Voltage	$I_S = -1.0A, V_{GS}=0V$	V_{SD}	--	-0.82	-1.2	V
Maximum Continuous Drain-Source Diode Forward Current	--	I_S	--	--	-1.0	A
Reverse Recovery Time	$V_{GS} = 0V, I_S = -2.5A,$ $di_F/dt=100A/us$	trr	--	13	--	Ns
Reverse Recovery Charge		Q_{rr}	--	8.7	--	nC

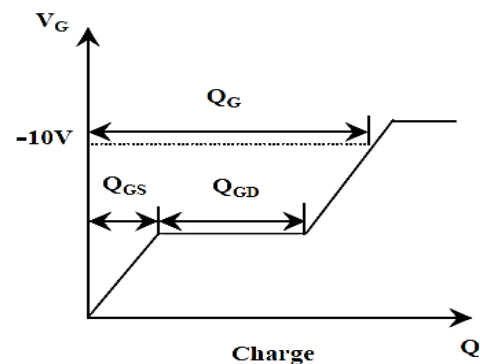
Note: 1. $T_A = 25^\circ C$ unless otherwise noted

TYPICAL CHARACTERISTICS

Switching Time Waveform

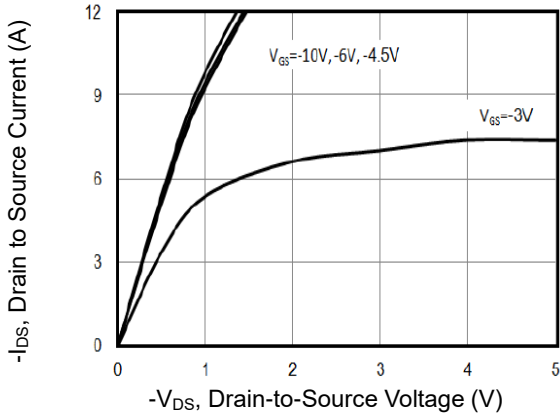


Gate Charge Waveform

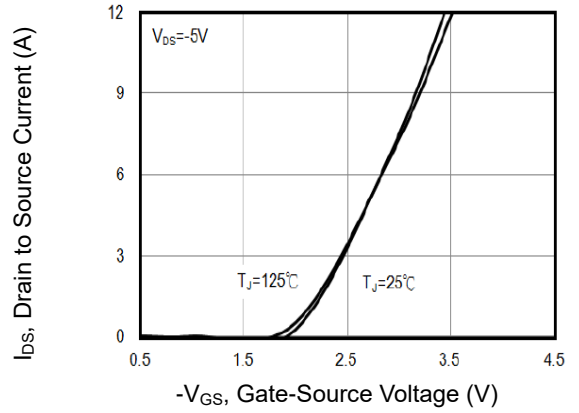


CHARACTERISTIC CURVES

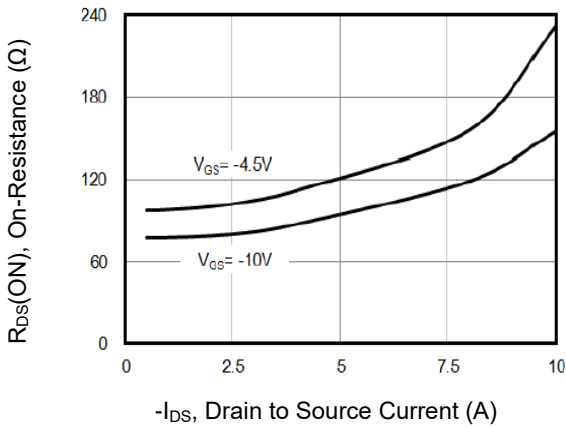
On Region Characteristics



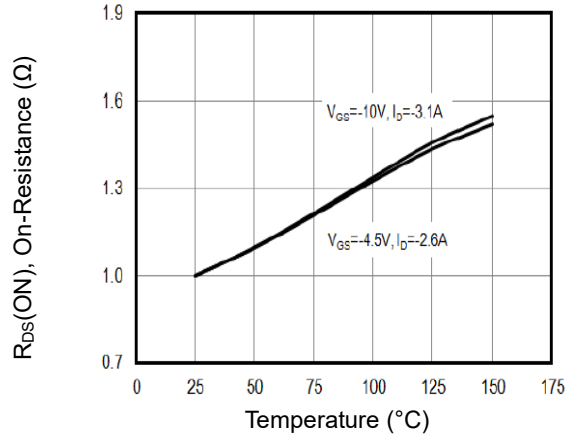
Transfer Characteristics



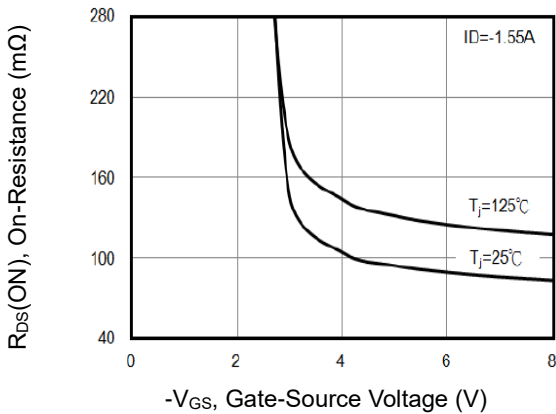
On-Resistance vs. Drain Current



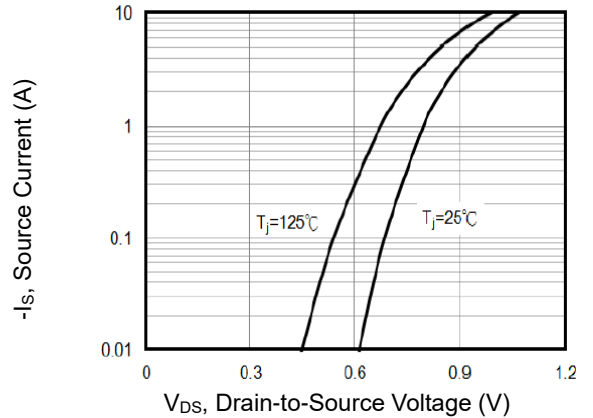
Capacitance



On-Resistance Variation with V_GS



On-Resistance vs. Junction Temperature



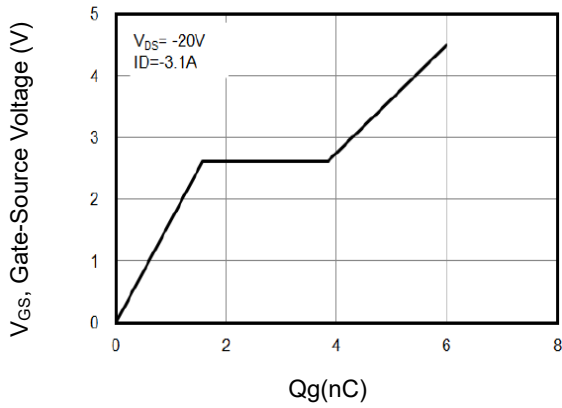
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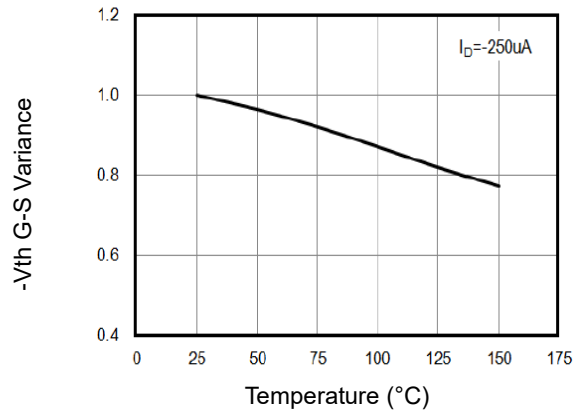
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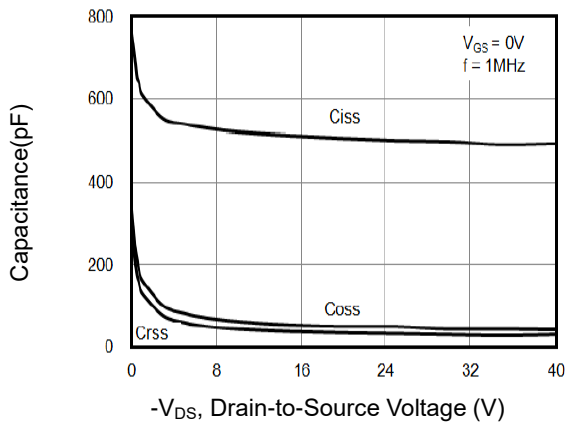
Gate charge Characteristics



Threshold Voltage Variance vs. Temperature



Capacitance vs. Drain-Source Voltage



*Specifications subject to change without notice.