

P-Channel MOSFET

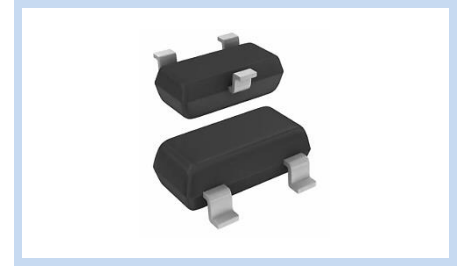
40V 6A SOT-23

MFT4P6A0S23

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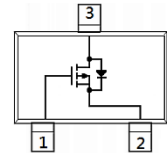
FEATURE

- $R_{DS(ON)} < 35m\Omega$ at $V_{GS} = -10V$
- $R_{DS(ON)} < 50m\Omega$ at $V_{GS} = -4.5V$
- Low Gate Charge
- Application: DC-DC Converter, Hard Switched and High Frequency Circuits, PWN Application



MECHANICAL DATA

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

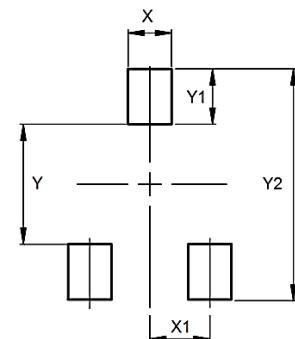
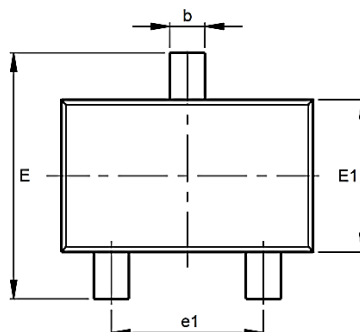
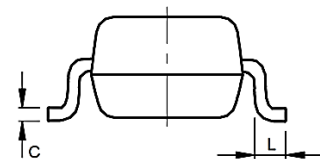
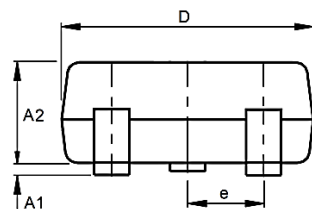


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	-6	A
Drain Current – Pulsed	I_{DM}	-24	A
Power Dissipation	P_D	1	W
Single-Pulse Avalanche Energy	E_{AS}	40	mJ
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	125	$^{\circ}C/W$
Operating Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature Range	T_{stg}	-55 to 150	$^{\circ}C$

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	0.000	0.100
A2	1.050	1.250
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
e	0.865	1.015
e1	1.800	2.000
E	2.650	2.950
E1	1.500	1.700
L	0.300	0.600
X	0.800	
X1	0.950	
Y	1.000	
Y1	1.000	
Y2	3.000	



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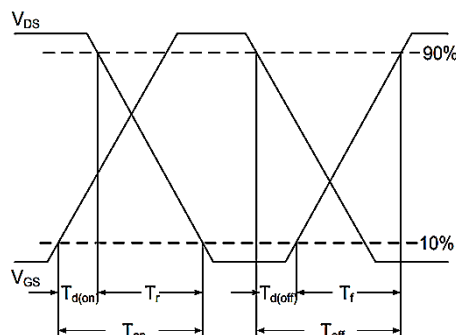
ELECTRICAL CHARACTERISTICS

Off 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	$V_{GS}=V_{DS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.2	-1.5	-2.5	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	I_{GSS}	--	--	± 0.1	μA
Zero Gate Voltage Drain Current	$V_{DS}=-32V, V_{GS}=0V$	I_{DSS}	--	--	-1	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-5A$	$R_{DS(on)}$	--	28	35	m Ω
	$V_{GS}=-4.5V, I_D=-4A$		--	38	50	
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, F=1.0MHz$	C_{iss}	--	1415	--	pF
Output Capacitance		C_{oss}	--	134	--	
Reverse Transfer Capacitance		C_{rss}	--	102	--	
Turn-On Delay Time	$V_{DS}=-15V, I_D=-1A, V_{GS}=-10V, R_G=3.3\Omega$	$T_{d(on)}$	--	22	--	nS
Rise Time		T_r	--	15.7	--	
Turn-Off Delay Time		$T_{d(off)}$	--	59	--	
Fall Time		T_f	--	5.5	--	
Total Gate Charge	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-1A$	Q_g	--	11.5	--	nC
Gate-Source Charge		Q_{gs}	--	3.5	--	
Gate-Drain Charge		Q_{gd}	--	3.3	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	-7	A
Diode Forward Voltage	$I_S=-1A, V_{GS}=0V, T_J=25^\circ C$	V_{SD}	--	--	-1.2	V

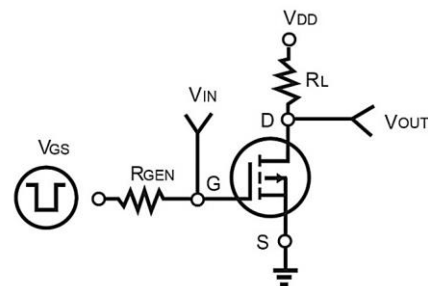
Note:

1. $T_A = 25^\circ C$ unless otherwise noted.
2. The pulsed drain current tested by surface mounted on a 1 inch² FR-4 board with 2oz copper.
3. $R_{DS(on)}$ tested by pulse, pulse width $\leq 300\mu s$, duty cycles $\leq 2\%$.
4. The E_{AS} data shows Max. rating. The test condition is $V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-27A$
5. The power dissipation is limited by junction temperature $T_{J(MAX)}=150^\circ C$

Switching Time Waveform



Switching Test Circuit



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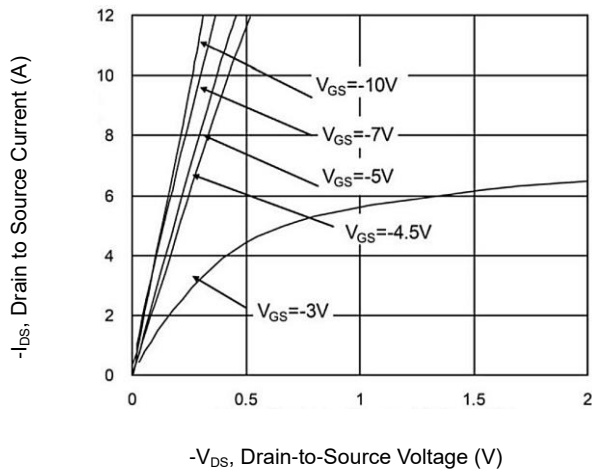
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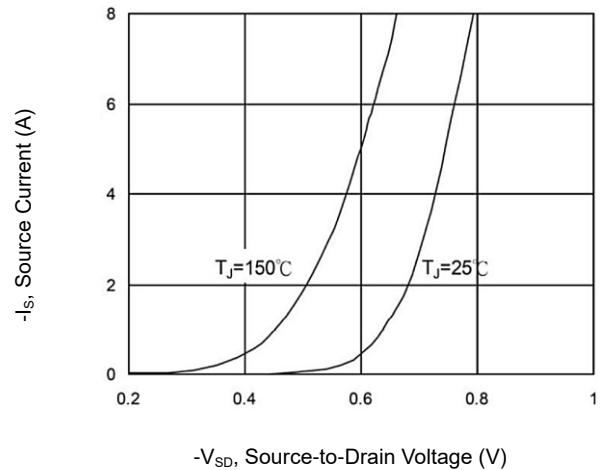
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CHARACTERISTIC CURVES

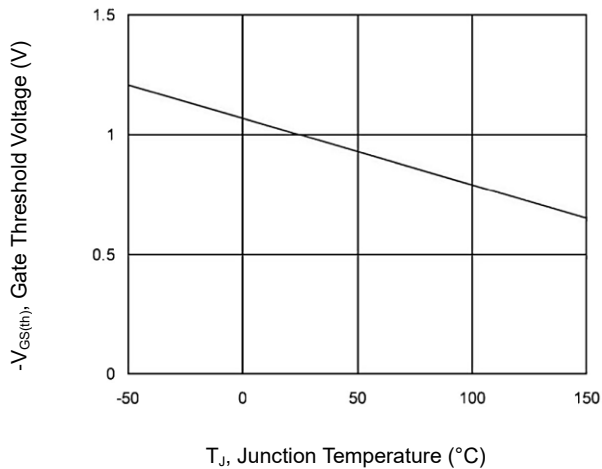
On Region Characteristics



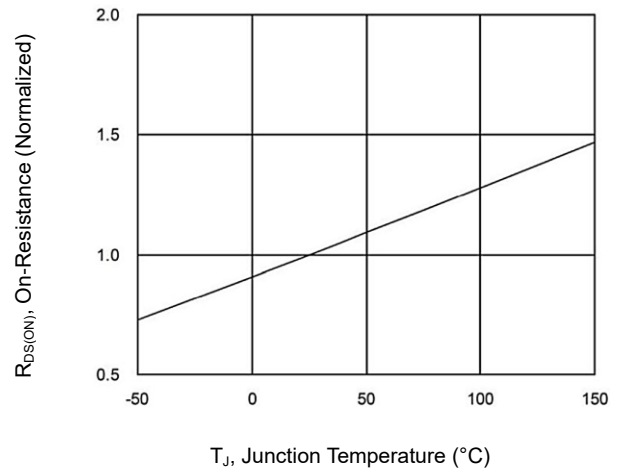
Body Diode Characteristics



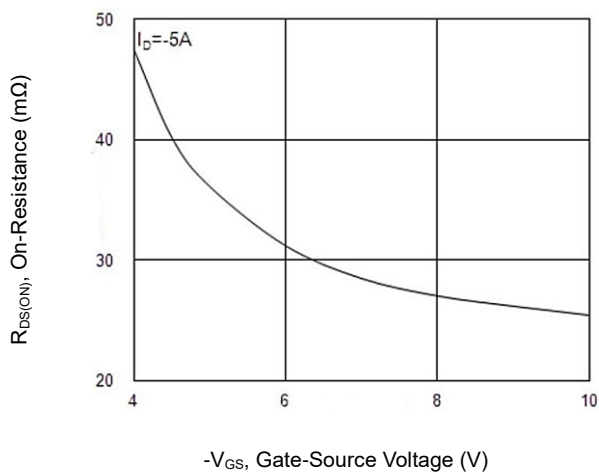
Threshold Voltage Variance vs. Temperature



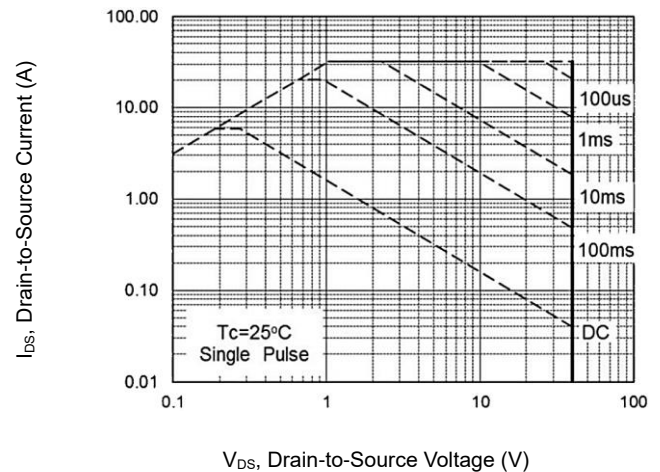
On-Resistance vs. Junction Temperature



On-Resistance Variation with V_{GS}



Maximum Safe Operating Area



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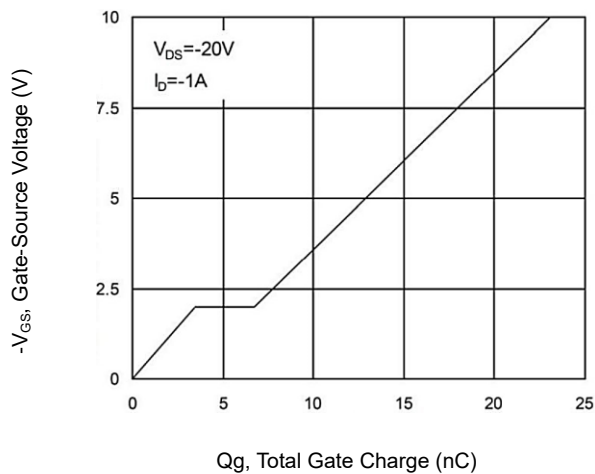
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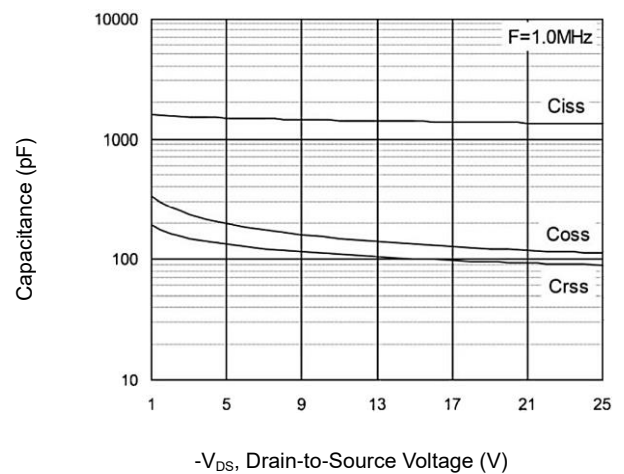
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CHARACTERISTIC CURVES

Gate Charge Characteristics



Capacitance vs. Drain-Source Voltage



Normalized Transient Thermal Impedance

