

P-Channel MOSFET

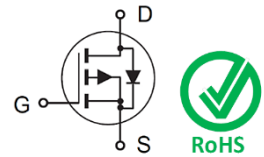
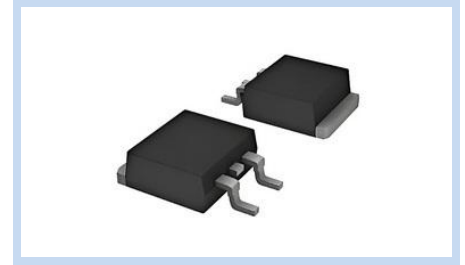
100V 15A 50W TO-252

MFT10P15T252

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FEATURE

- $R_{DS(ON)} < 185m\Omega$ at $V_{GS} = -10V$
- $R_{DS(ON)} < 200m\Omega$ at $V_{GS} = -4.5V$
- Low Gate Charge
- Extremely Low On-Resistance
- Application: Brushless Motor, Load Switch, Uninterruptible Power Supply



MECHANICAL DATA

- Case: TO-252 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

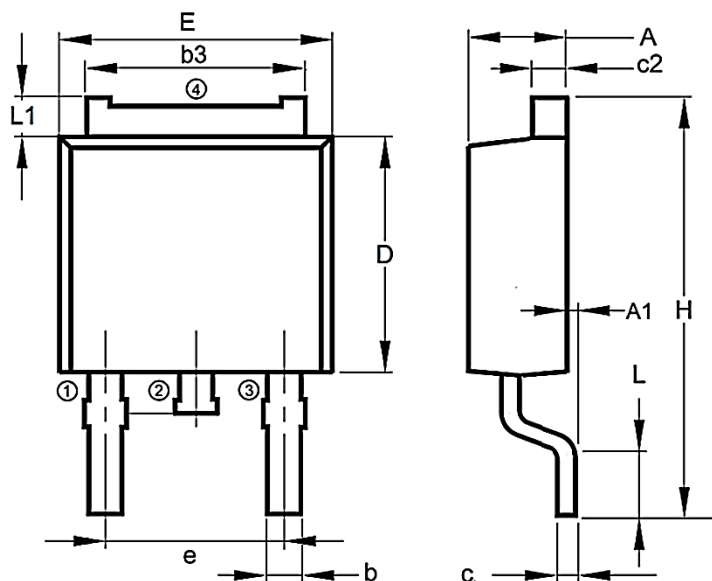
MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$T_C = 25^\circ C$	I_D	-15	A
	$T_C = 100^\circ C$		-12	
Drain Current – Pulsed		I_{DM}	-45	A
Power Dissipation		P_D	50	W
Single Pulse Avalanche Energy		E_{AS}	56	mJ
Thermal Resistance Junction to Case		$R_{\theta JC}$	2.5	$^\circ C/W$
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to 150	$^\circ C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	2.10	2.50
A1	0.00	0.10
b	0.66	0.86
b3	5.18	5.48
c	0.40	0.60
c2	0.44	0.58
D	5.90	6.30
E	6.40	6.80
e	4.47	4.67
H	9.50	10.70
L	1.35	1.65
L1	1.09	1.21

Note: 1: Gate, 2: Drain, 3: Source



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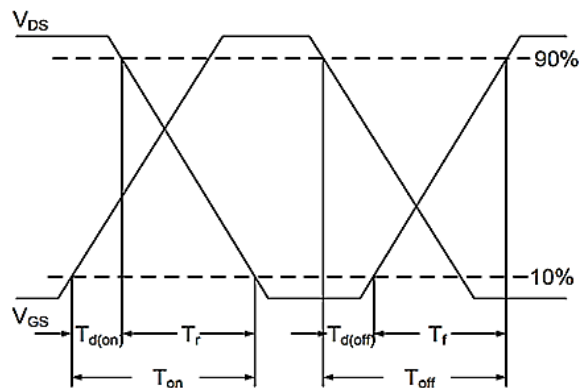
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	BV_{DSS}	-100	--	--	V
Drain-Source Leakage Current	$V_{DS}=-80V, V_{GS}=0V$	I_{DSS}	--	--	-1	μA
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-2A$	$R_{DS(ON)}$	--	145	185	m Ω
	$V_{GS}=-4.5V, I_D=-1A$		--	170	200	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.0	--	-2.5	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=-50V, V_{GS}=-10V, I_D=-2A$	Q_g	--	27	--	nC
Gate-Source Charge		Q_{GS}	--	5.3	--	
Gate-Drain Charge		Q_{GD}	--	3.2	--	
Turn-On Delay Time	$V_{DD}=-50V, V_{GS}=-10V, R_G=4.5\Omega, I_D=-2A, R_L=25\Omega$	$T_{d(on)}$	--	10	--	nS
Rise Time		T_r	--	27	--	
Turn-Off Delay Time		$T_{d(off)}$	--	288	--	
Fall Time		T_f	--	88	--	
Input Capacitance	$V_{DS}=-50V, V_{GS}=0V, F=1MHz$	C_{iss}	--	1545	--	pF
Output Capacitance		C_{oss}	--	37	--	
Reverse Transfer Capacitance		C_{rss}	--	25	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Diode Forward Current	--	I_S	--	--	-15	A
Diode Forward Voltage	$V_{GS}=0V, I_S=-2A$	V_{SD}	--	--	-1.3	V
Reverse Recovery Time	$I_S=-6A, di/dt=100A/\mu s$	t_{rr}	--	40	--	nS
Reverse Recovery Charge		Q_{rr}	--	28	--	nC

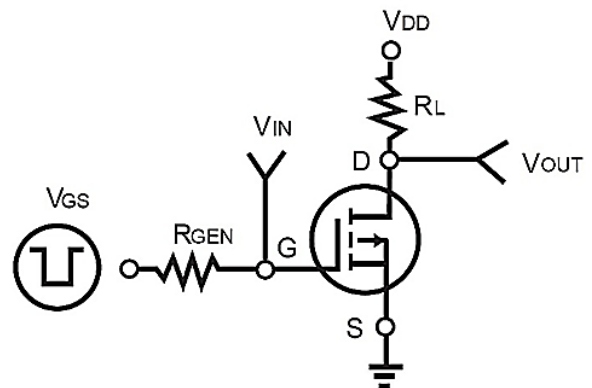
Note:

1. Power dissipation is limited by maximum junction temperature $T_{J(MAX)}=150^\circ C$.
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$.
3. The E_{AS} data shows Max. rating. The test condition is $L=0.1mH, I_{AS}=-15A, V_{GS}=-10V, V_{DD}=-72V$.
4. Device mounted on 1 inch square FR-4 board with 2oz copper.

Switching Time Waveform



Switching Test Circuit



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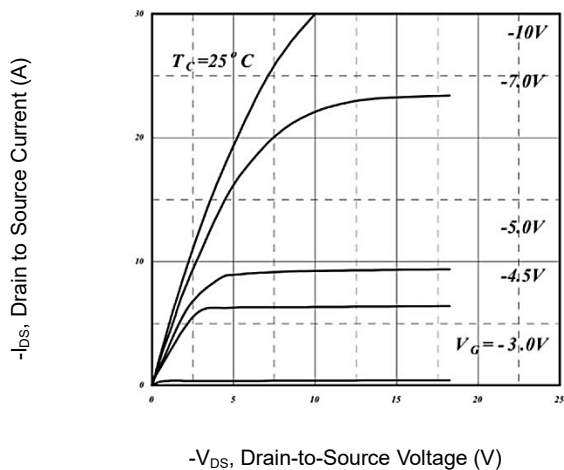
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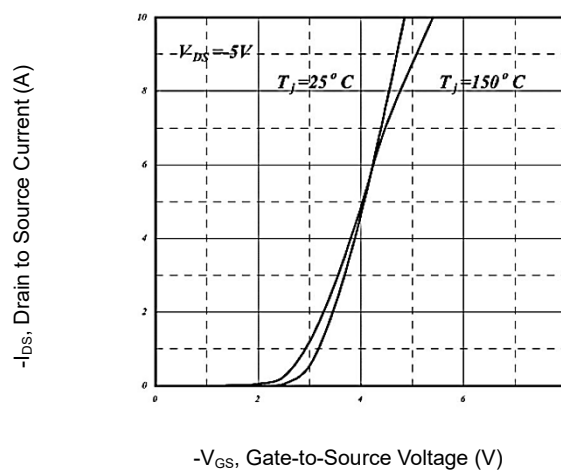
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CHARACTERISTIC CURVES

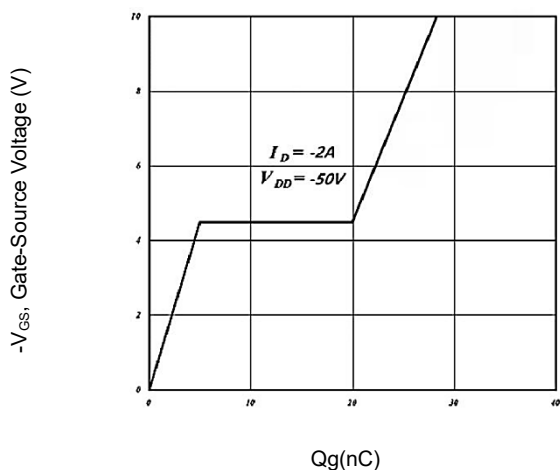
On Region Characteristics



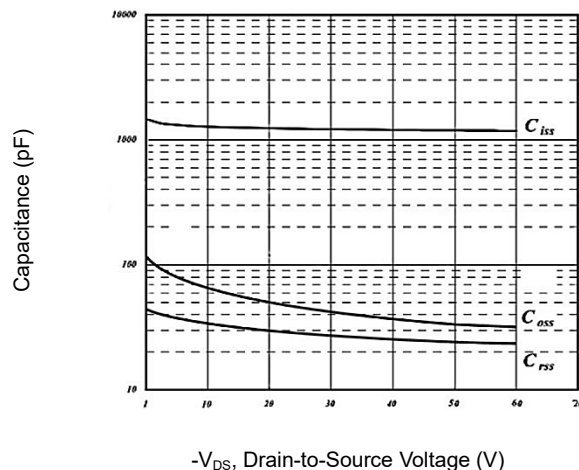
Transfer Characteristics



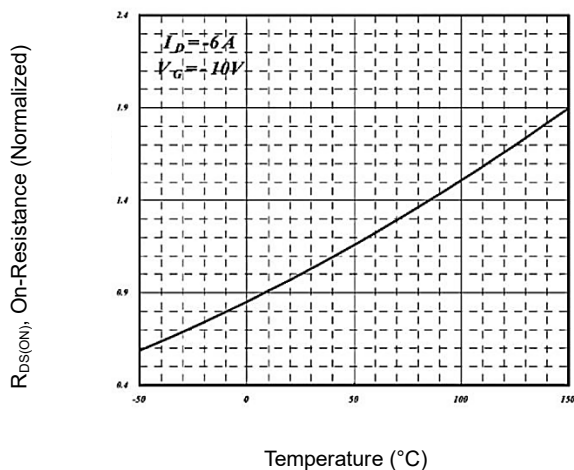
Gate Charge Characteristics



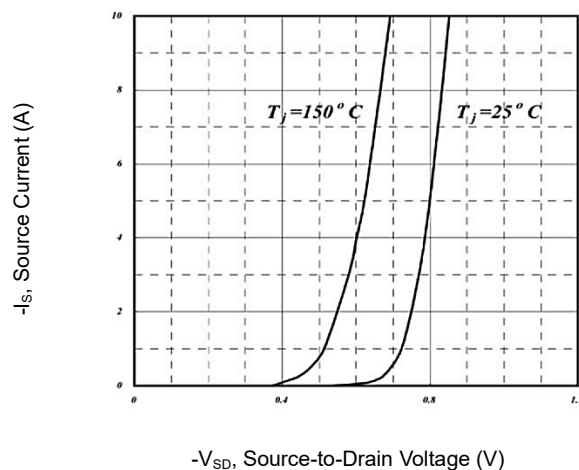
Capacitance vs. Drain-Source Voltage



On-Resistance vs. Junction temperature



Body Diode Characteristics



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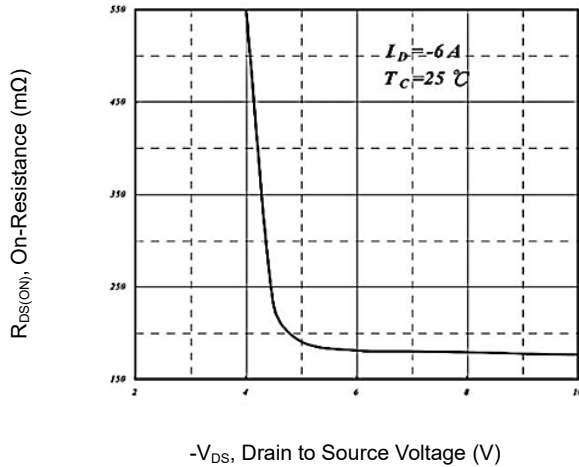
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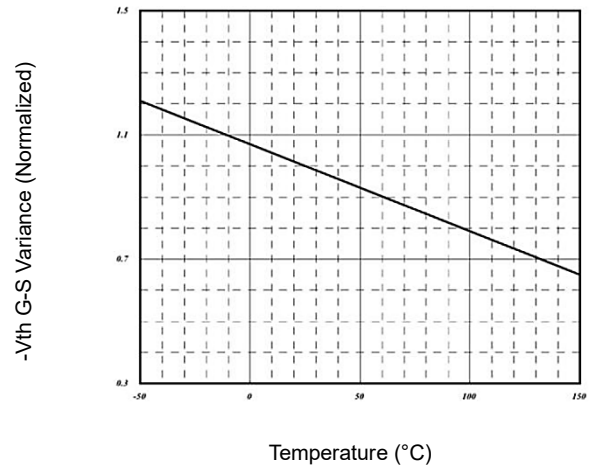
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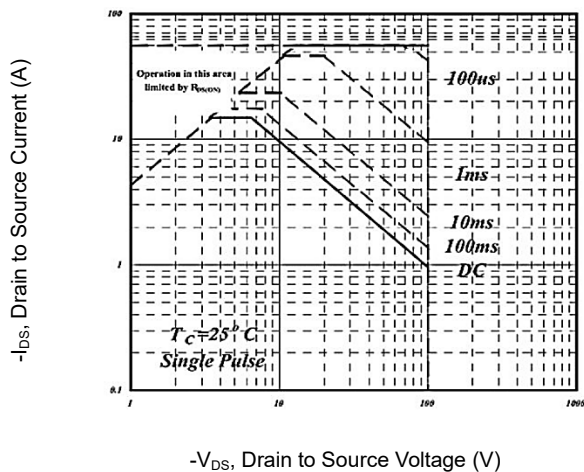
On-Resistance vs. Gate-Source Voltage



Threshold Voltage Variance vs. Temperature



Maximum Safe Operating Area



Maximum Transient Thermal Impedance

