

N-Channel MOSFET

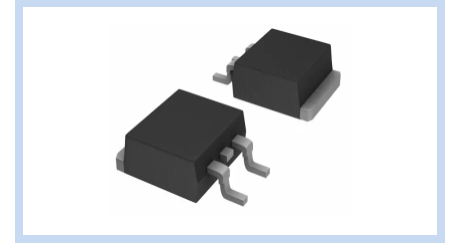
100V 53A TO-252

MFT10N53T252

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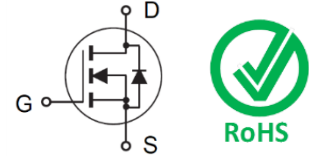
FEATURE

- $R_{DS(ON)}=12m\Omega$ at $V_{GS}=10V$
- High Power and Current Handling Capability
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$



MECHANICAL DATA

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

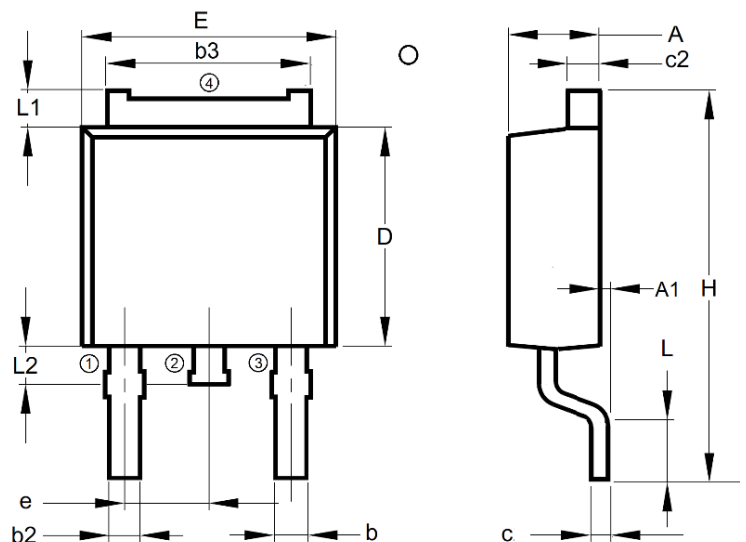


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	$T_C=25^\circ C$	53
		$T_C=100^\circ C$	34
Drain Current – Pulsed	I_{DM}	212	A
Power Dissipation	P_D	$T_C=25^\circ C$	65
		Derate above $25^\circ C$	0.52
Single Pulse Avalanche Energy	E_{AS}	84.5	mJ
Single Pulse Avalanche Current	I_{AS}	13	A
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	50	$^\circ C/W$
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.9	$^\circ C/W$
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 to 150	$^\circ C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	2.20	2.40
A1	--	0.13
b	0.50	0.90
b2	0.76	1.14
b3	4.95	5.59
c	0.40	0.61
c2	0.45	0.89
D	5.40	6.63
E	6.05	7.10
e	1.98	2.59
H	8.80	10.60
L	0.25	--
L1	0.70	1.78
L2	0.50	1.20



Note: 1: Gate, 2, 4: Drain, 3: Source

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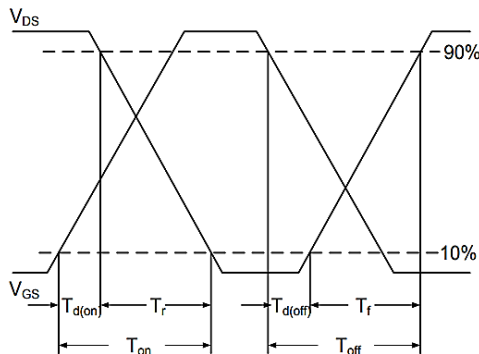
ELECTRICAL CHARACTERISTICS

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	$V_{DS}=100V, V_{GS}=0V$	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	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	--	9.5	12	m Ω
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	2	--	4	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=20A$	Q_g	--	19	--	nC
Gate-Source Charge		Q_{gs}	--	4	--	nC
Gate-Drain Charge		Q_{gd}	--	7	--	nC
Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_G=6\Omega, I_D=1A$	$T_{d(on)}$	--	23	--	ns
Rise Time		T_r	--	6	--	ns
Turn-Off Delay Time		$T_{d(off)}$	--	43	--	ns
Fall Time		T_f	--	39	--	ns
Input Capacitance	$V_{DS}=30V, V_{GS}=0V, F=1MHz$	C_{iss}	--	1135	--	pF
Output Capacitance		C_{oss}	--	700	--	pF
Reverse Transfer Capacitance		C_{rss}	--	5	--	pF
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Diode Forward Current	--	I_S	--	--	53	A
Diode Forward Voltage	$V_{GS}=0V, I_S=20A, T_J=25^\circ C$	V_{SD}	--	--	1.2	V

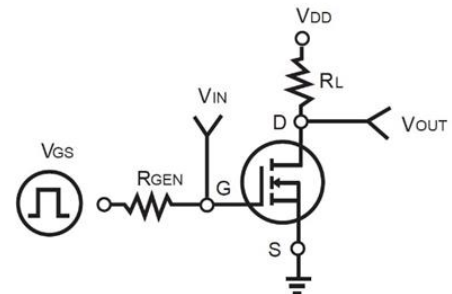
Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
3. Guaranteed by design, not subject to production testing.
4. L=1mH $I_{AS}=13A, V_{DD}=25V, R_G=25\Omega$

Switching Time Waveform

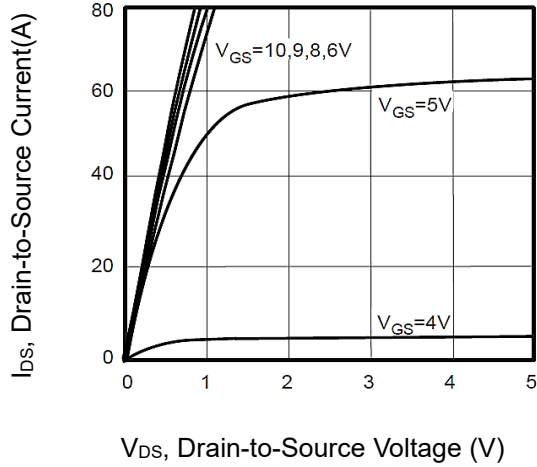


Switching Test Circuit

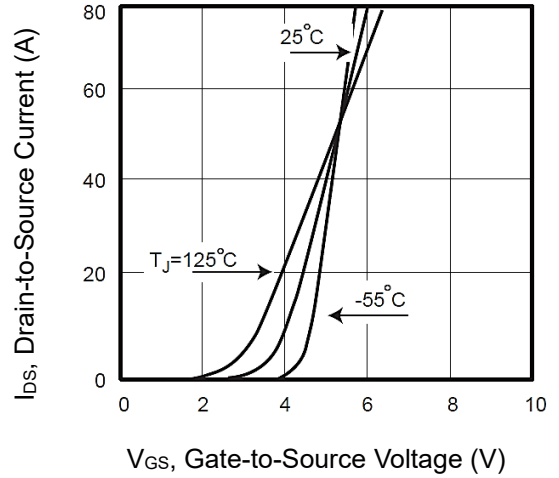


CHARACTERISTIC CURVES

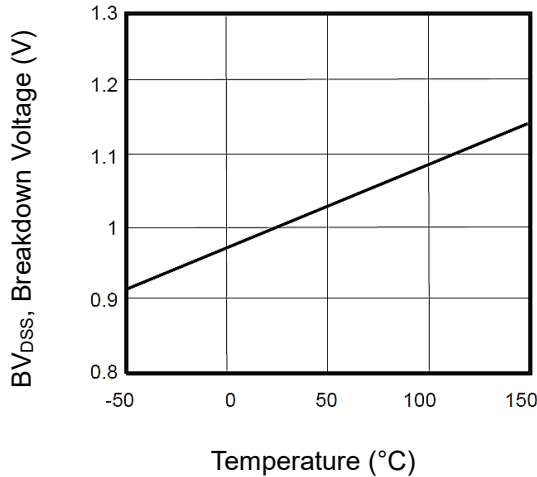
Output Characteristics



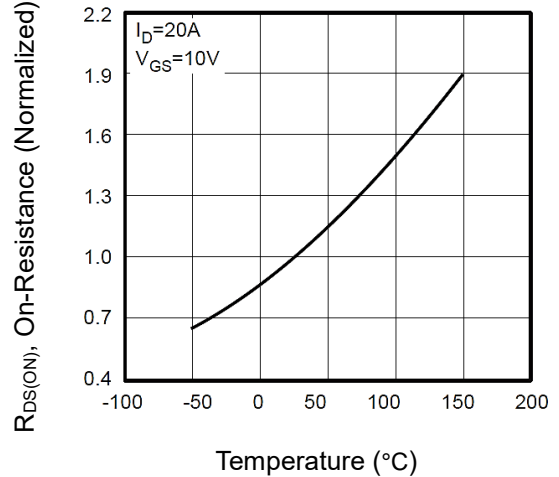
Transfer Characteristics



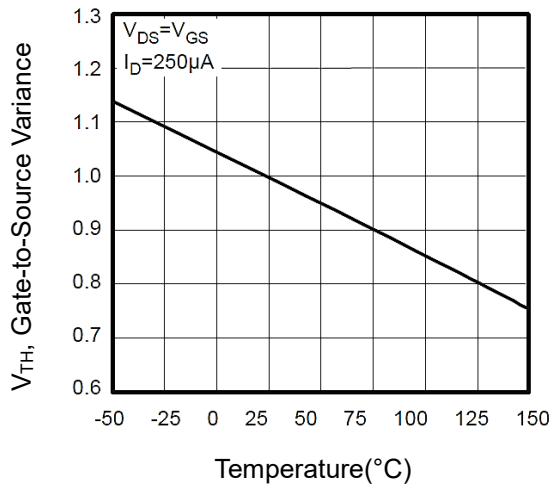
Breakdown Voltage vs. Temperature



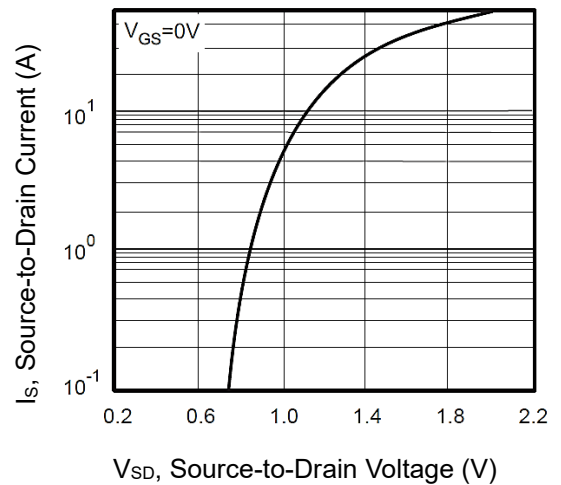
On-Resistance vs. Junction temperature



Threshold Voltage Variation with Temperature



Body Diode Characteristics



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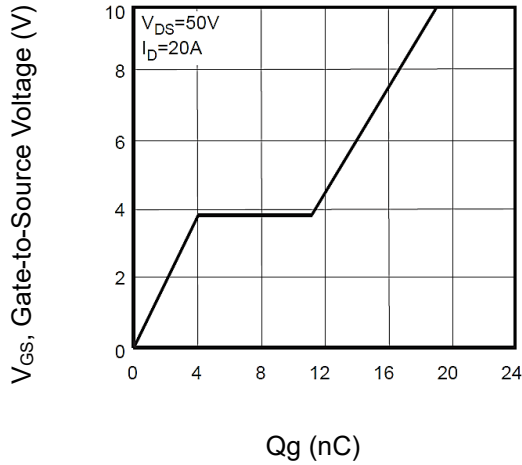
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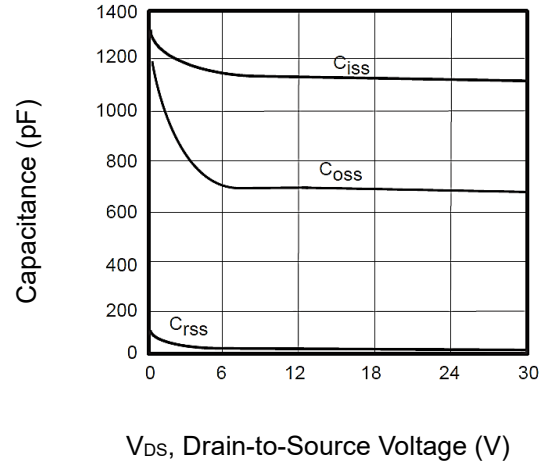
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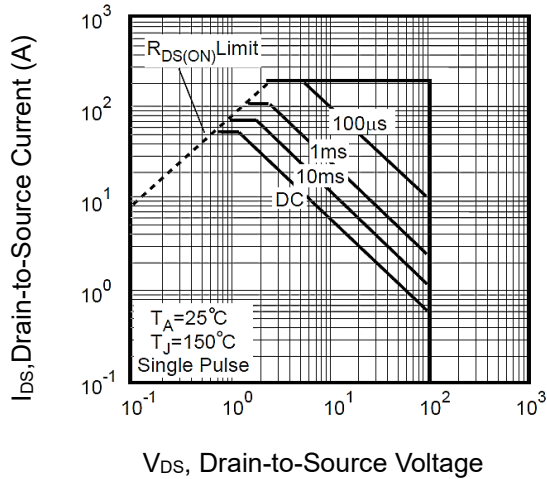
Gate-Charge Characteristics



Capacitance vs. Drain-Source Voltage



Maximum Safe Operating Area



Normalized Transient Thermal Impedance vs Pulse Width

