

N-Channel MOSFET
60V 53A TO-252

MFT6N53T252

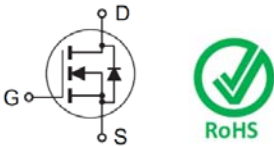
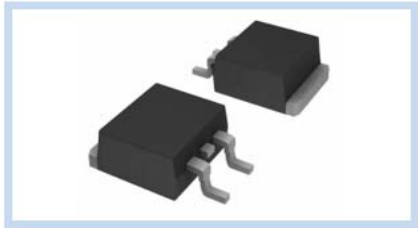
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FEATURE

- Simple Drive Requirement
- Low on Resistance
- Fast Switching Characteristics

MECHANICAL DATA

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

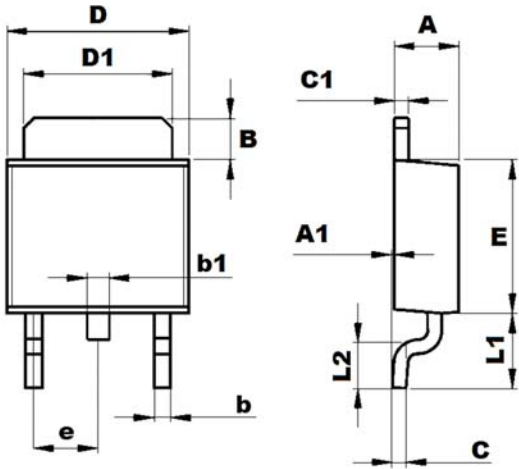


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$V_{GS}=10V, T_C=25^{\circ}C$	I_D	53	A
	$V_{GS}=10V, T_C=100^{\circ}C$		33	A
	$V_{GS}=10V, T_A=25^{\circ}C$		12	A
	$V_{GS}=10V, T_A=70^{\circ}C$		9.6	A
Drain Current – Pulsed		I_{DM}	214	A
Pulsed Body Diode Forward Current	$T_A=25^{\circ}C$	I_S	10	A
Avalanche Current	$L=0.1mH$	I_{AS}	25	A
Avalanche Energy	$L=0.5mH$	E_{AS}	56	mJ
Power Dissipation	$T_C=25^{\circ}C$	P_D	50	W
	$T_C=100^{\circ}C$		20	W
	$T_A=25^{\circ}C$		2.5	W
	$T_A=70^{\circ}C$		1.0	W
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	50	$^{\circ}C/W$
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

TO-252	Min (mm)	Max (mm)
A	2.18	2.39
A1	--	0.13
B	0.89	1.27
b	0.64	0.89
C	0.508 BSC	
C1	0.46	0.89
D	6.35	6.73
D1	4.95	5.46
E	5.97	6.22
e	2.29	--
L1	2.74 BSC	
L2	1.40	1.78



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ELECTRICAL CHARACTERISTICS

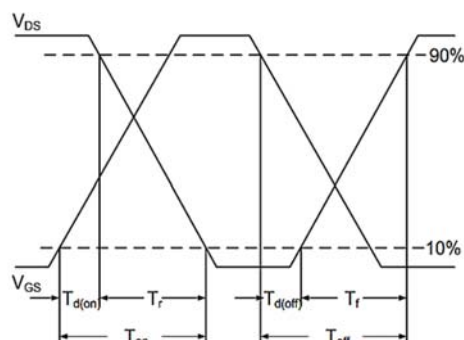
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	60	--	--	V
Drain-Source Leakage Current	$V_{DS}=48V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=12A$	$R_{DS(ON)}$	--	6	8	m Ω
	$V_{GS}=4.5V, I_D=12A$		--	9.5	13.5	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1	--	2.5	V
Forward Transconductance	$V_{DS}=5V, I_D=10A$	G_{FS}	--	21	--	S
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=48V, V_{GS}=10V, I_D=12A$	Q_g	--	37	--	nC
Gate-Source Charge		Q_{gs}	--	9	--	nC
Gate-Drain Charge		Q_{gd}	--	8	--	nC
Turn-On Delay Time	$V_{DS}=30V, V_{GS}=10V, R_G=3\Omega, I_D=12A$	$T_{d(on)}$	--	20	--	ns
Rise Time		T_r	--	19	--	ns
Turn-Off Delay Time		$T_{d(off)}$	--	62	--	ns
Fall Time		T_f	--	13	--	ns
Input Capacitance	$V_{DS}=30V, V_{GS}=0V, F=1MHz$	C_{iss}	--	2333	--	pF
Output Capacitance		C_{oss}	--	338	--	pF
Reverse Transfer Capacitance		C_{rss}	--	37	--	pF
Intrinsic Gate Resistance	$f=1MHz$	R_g	--	2	--	Ω
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Reverse Recovery Time	$I_F=10A, dI_F/dt=100A/\mu S$	t_{rr}	--	24	--	ns
Reverse Recovery Charge		Q_{rr}	--	19	--	nC
Diode Forward Voltage	$V_{GS}=0V, I_S=10A, T_J=25^\circ C$	V_{SD}	--	0.8	1.2	V

Note:

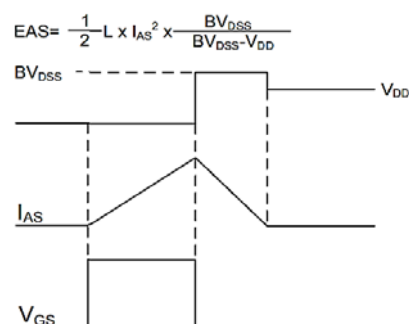
1. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. Independent of operating temperature.
3. The Power Dissipation P_D is based on $T_{J(MAX)}=150^\circ C$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used
4. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with $T_A=25^\circ C$. The power Dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of $150^\circ C$.

The value in any given application depends on the user's specific board design.

Switching Time Waveform



EAS Waveform



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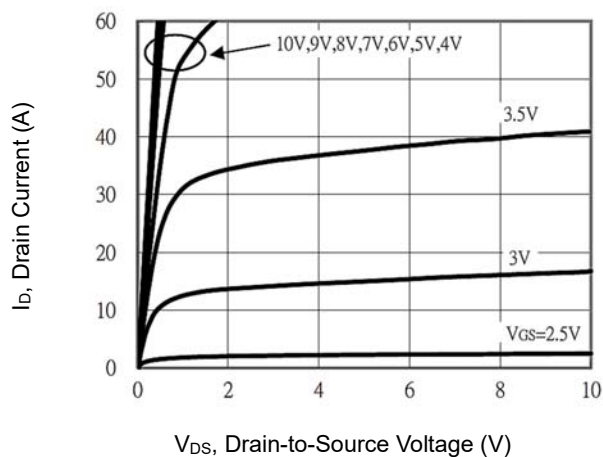
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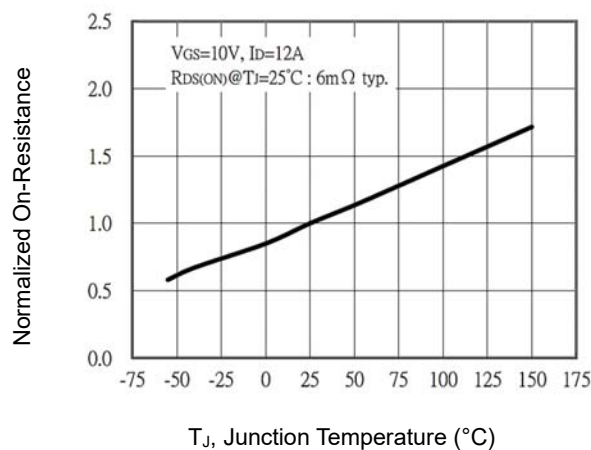
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CHARACTERISTICS CURVES

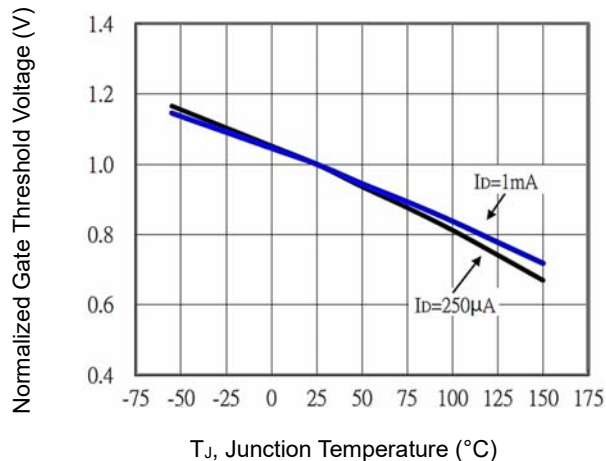
Output Characteristics



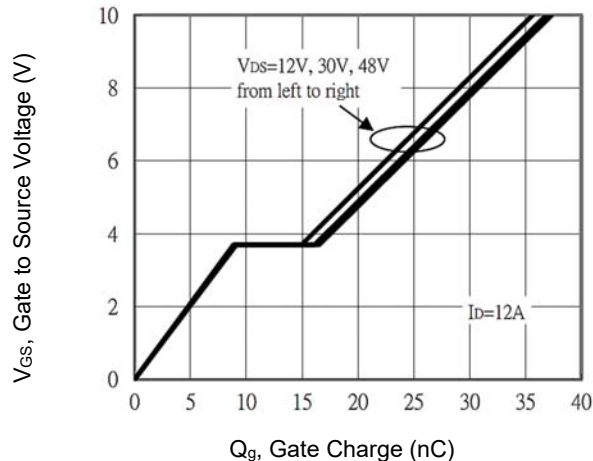
On-Resistance vs. Junction Temperature



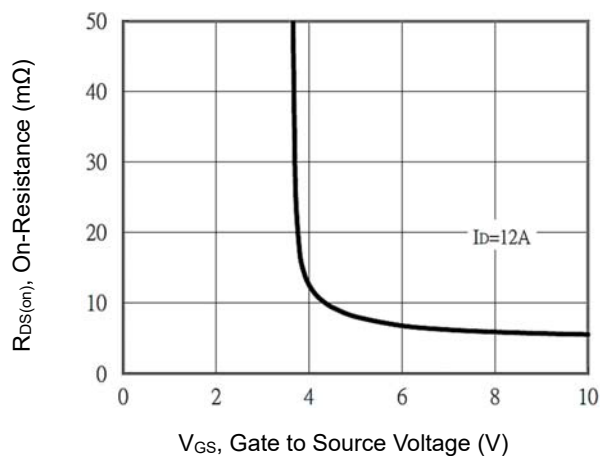
Threshold Voltage vs. Junction Temperature



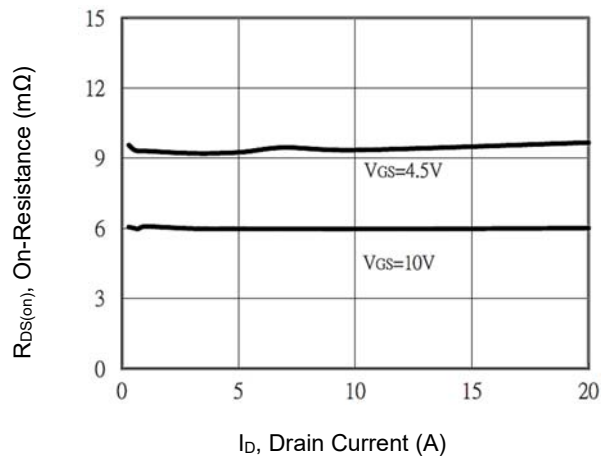
Gate Charge Characteristics



On-Resistance Variation with V_{GS}



On-Resistance vs. Drain Current



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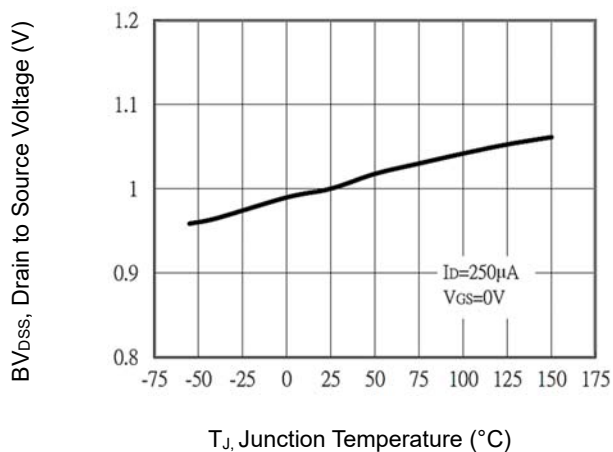
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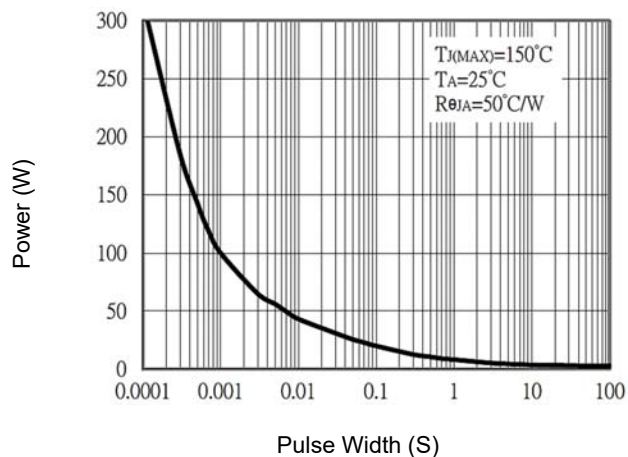
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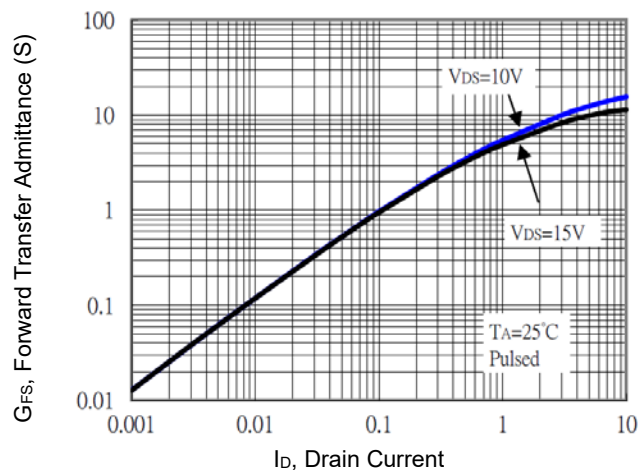
Breakdown Voltage Variation vs. Temperature



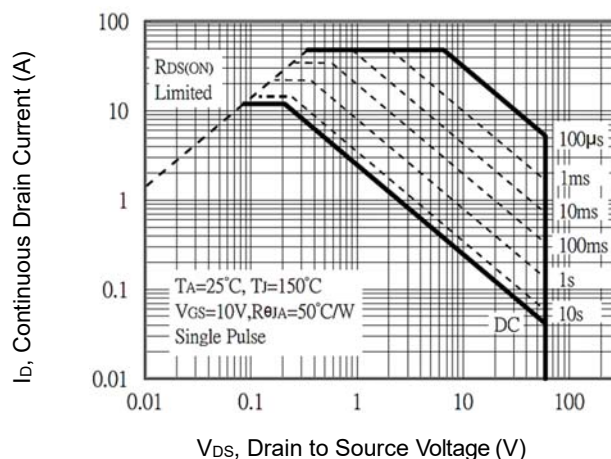
Single Pulse Power Rating, Junction to Case



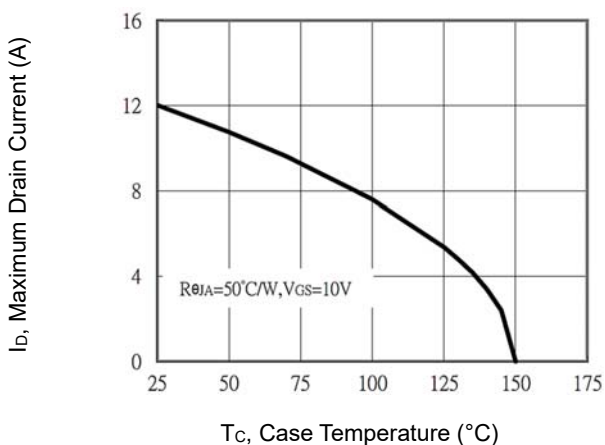
Forward Transfer Admittance vs Drain Current



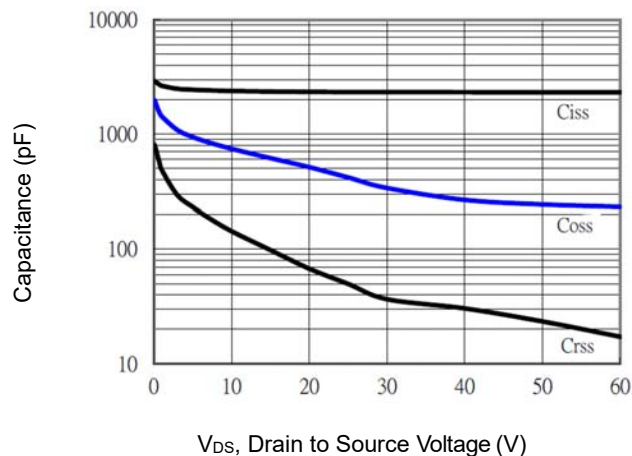
Maximum Safe Operation Area



Maximum Drain Current vs Case Temperature



Capacitance vs. Drain-Source Voltage



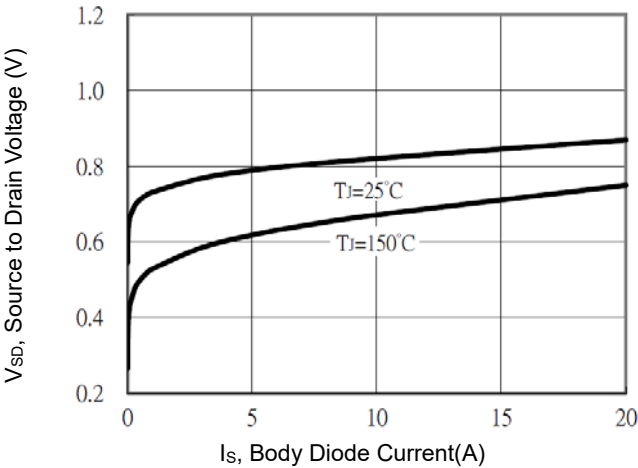
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CHARACTERISTICS CURVES

Body Diode Current vs. Source-Drain Voltage



Normalized Transient Impedance

