

N-Channel MOSFET

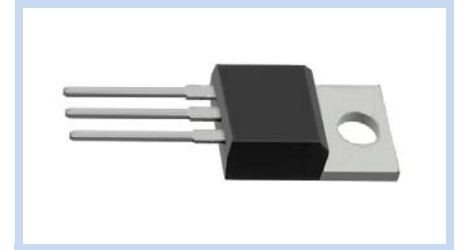
150V 200A 357W TO-220

MFT15N192T220

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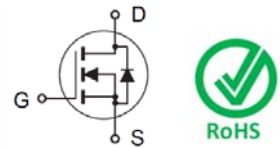
FEATURE

- $R_{DS(ON)} < 4.6m\Omega$ at $V_{GS}=10V, I_D=20A$
- High Power and Current Handling Capability
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$



MECHANICAL DATA

- Case: TO-220 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

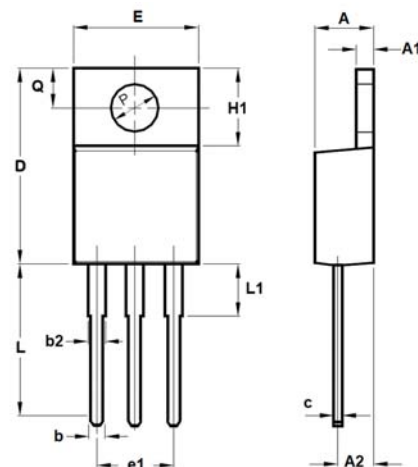


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	$T_C=25^\circ C$	192
		$T_C=100^\circ C$	122
Drain Current – Pulsed	I_{DM}	768	A
Power Dissipation	P_D	$T_C=25^\circ C$	357
		Derate above $25^\circ C$	2.85
Single Pulsed Avalanche Energy	E_{AS}	720	mJ
Single Pulsed Avalanche Current	I_{AS}	60	A
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.35	$^\circ C/W$
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 to 150	$^\circ C$

DIMENSIONS

Item	Min (mm)	Max (mm)
A	4.320	4.826
A1	1.220	1.397
A2	2.032	2.921
b	0.610	0.910
b2	1.143	1.778
c	0.356	0.530
D	14.224	16.510
E	9.652	10.668
e1	5.080	5.080
H1	5.842	6.858
L	12.700	14.732
L1	3.400	4.000
Q	2.540	3.429



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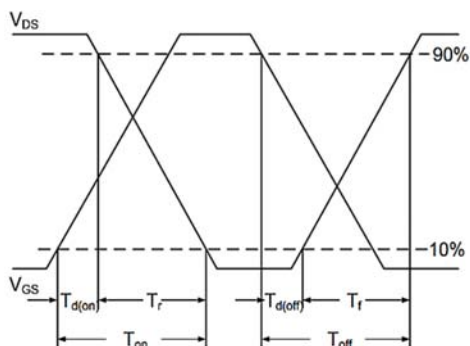
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	150	--	--	V
Drain-Source Leakage Current	$V_{DS}=150V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Body Leakage Current, Forward	$V_{GS}=20V, V_{DS}=0V$	I_{GSSF}	--	--	100	nA
Gate-Body Leakage Current, Reverse	$V_{GS}=-20V, V_{DS}=0V$	I_{GSSR}	--	--	-100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	--	3.8	4.6	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	$V_{DS}=75V, V_{GS}=10V, I_D=20A$	Q_g	--	64	--	nC
Gate-Source Charge		Q_{gs}	--	18	--	nC
Gate-Drain Charge		Q_{gd}	--	12	--	nC
Turn-On Delay Time	$V_{DD}=75V, V_{GS}=10V, R_G=10\Omega, I_D=20A$	$T_{d(on)}$	--	30	--	ns
Rise Time		T_r	--	25	--	ns
Turn-Off Delay Time		$T_{d(off)}$	--	80	--	ns
Fall Time		T_f	--	46	--	ns
Input Capacitance	$V_{DS}=75V, V_{GS}=0V, F=1MHz$	C_{iss}	--	3190	--	pF
Output Capacitance		C_{oss}	--	730	--	pF
Reverse Transfer Capacitance		C_{rss}	--	15	--	pF
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Diode Forward Current	--	I_S	--	--	192	A
Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	V_{SD}	--	--	1.5	V

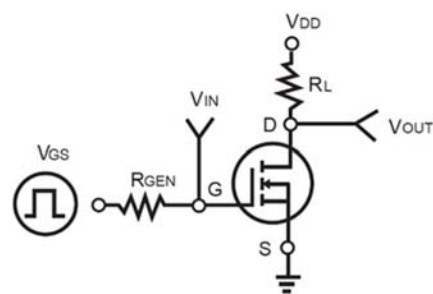
Note:

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. Limited only by maximum temperature allowed.
5. Pulse Width Limited by safe operating area.
6. Full package $I_{S(MAX)} = 96A$.
7. Full package VSD test condition $I_S = 96A$.
8. $L=0.4mH, I_{AS} = 60A, V_{DD}= 50V, R_G=25\Omega$, Starting $T_J=25^\circ C$.

Switching Time Waveform



Switching Test Circuit



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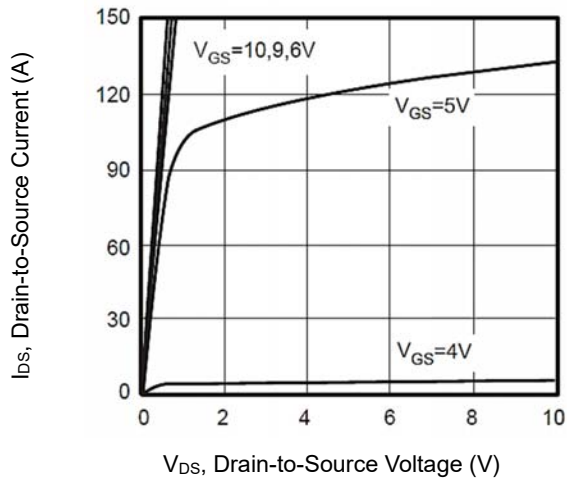
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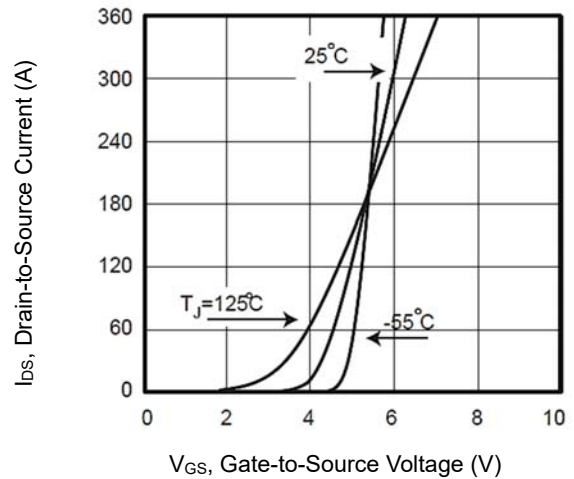
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CHARACTERISTIC CURVES

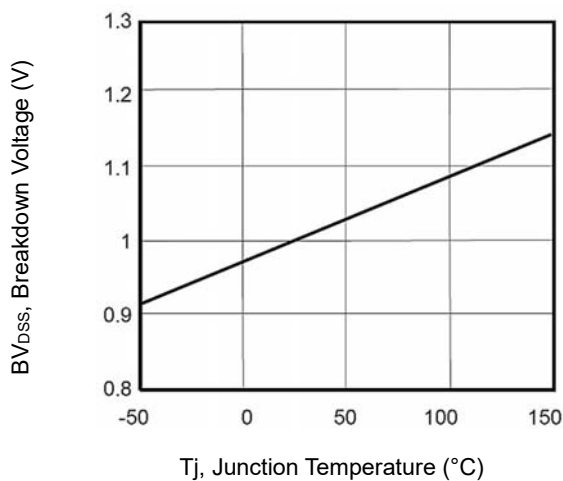
Output Characteristics



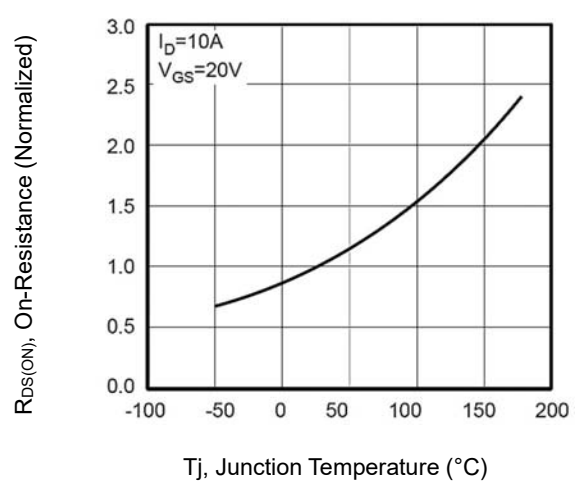
Transfer Characteristics



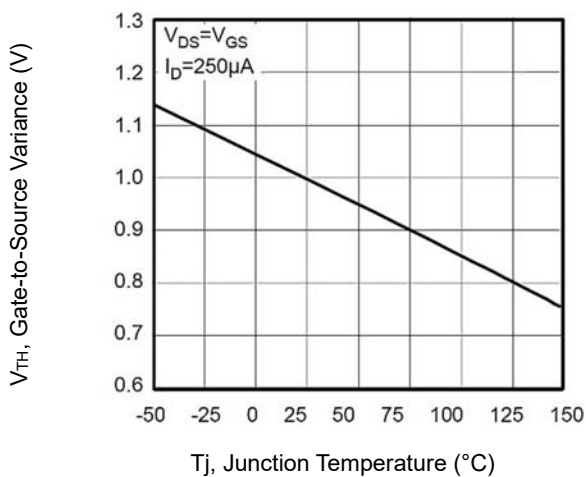
Breakdown Voltage vs. Temperature



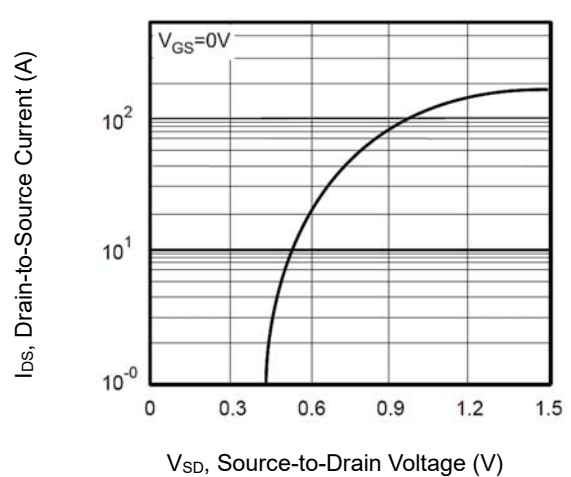
On-Resistance vs. Temperature



Threshold Voltage Variance vs. Temperature



Body Diode Characteristics



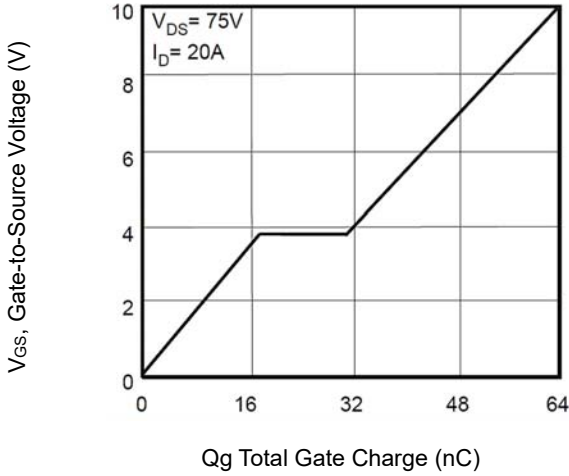
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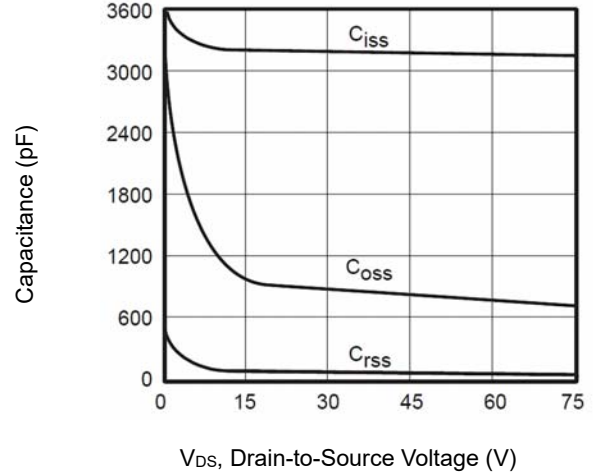
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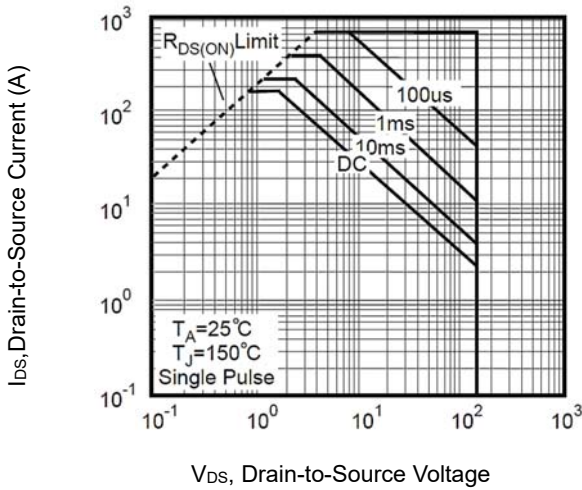
Gate-Charge Characteristics



Capacitance vs. Drain-Source Voltage



Maximum Safe Operating Area



Normalized Transient Thermal Impedance Curve

