

N-Channel MOSFET

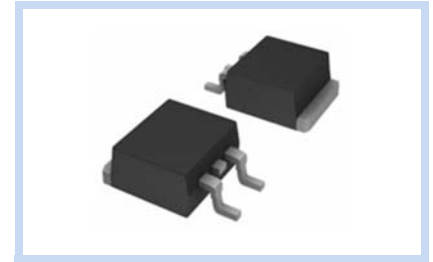
200V 19A TO-263

MFT20N19T263

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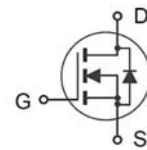
FEATURE

- $R_{DS(ON)} < 0.15\Omega$ at $V_{GS}=10V$, $I_D=10A$
- High Power and Current Handling Capability
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$



MECHANICAL DATA

- Case: TO-263 Package
- Terminals: Solderable per MIL-STD-750, Method 2026



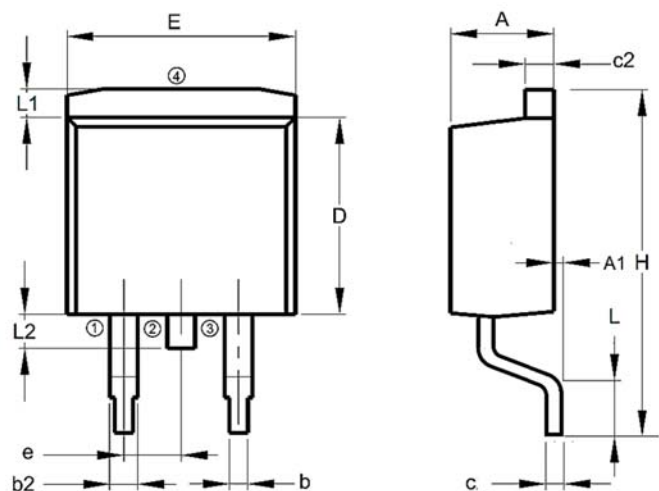
MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous		I_D	19	A
Drain Current – Pulsed		I_{DM}	76	A
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	125	W
	Derate above 25°C		1.0	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy		E_{AS}	400	mJ
Single Pulsed Avalanche Current		I_{AS}	4	A
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Thermal Resistance Junction to Case		$R_{\theta JC}$	1.0	$^\circ\text{C/W}$
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

DIMENSIONS

Item	Min (mm)	Max (mm)
A	4.29	4.70
A1	--	0.25
b	0.69	0.94
b2	1.22	1.40
c	0.36	0.56
c2	1.22	1.40
D	8.64	9.65
E	9.70	10.54
e	2.29	2.79
H	14.61	15.88
L	2.24	2.84
L1	--	1.40
L2	0.96	1.78

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



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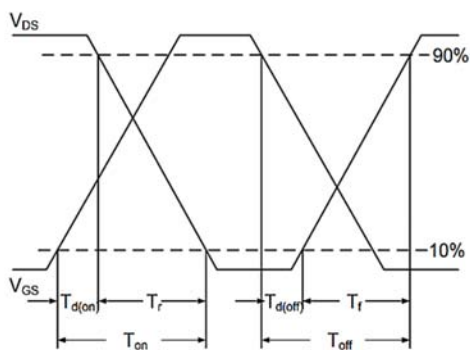
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	200	--	--	V
Drain-Source Leakage Current	$V_{DS}=160V, V_{GS}=0V$	I_{DSS}	--	--	25	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	$V_{GS}=10V, I_D=10A$	$R_{DS(ON)}$	--	0.125	0.150	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	$V_{DS}=160V, V_{GS}=10V, I_D=19A$	Q_g	--	44	57	nC
Gate-Source Charge		Q_{gs}	--	8	--	
Gate-Drain Charge		Q_{gd}	--	14	--	
Turn-On Delay Time	$V_{DD}=100V, V_{GS}=10V, R_G=9.1\Omega, I_D=11A$	$T_{d(on)}$	--	21	42	ns
Rise Time		T_r	--	5	10	
Turn-Off Delay Time		$T_{d(off)}$	--	66	132	
Fall Time		T_f	--	11	22	
Input Capacitance	$V_{DS}=25V, V_{GS}=0V, F=1.0MHz$	C_{iss}	--	1955	--	pF
Output Capacitance		C_{oss}	--	355	--	
Reverse Transfer Capacitance		C_{rss}	--	55	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Diode Forward Current	--	I_S	--	--	19	A
Diode Forward Voltage	$V_{GS}=0V, I_S=19A$	V_{SD}	--	--	1.5	V

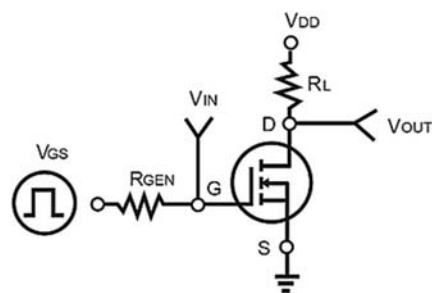
Note:

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. Pulse width limited by safe operating area .
5. Full Package $I_{S(max)}=10.5A$
6. Full Package V_{SD} test condition $I_S=10.5A$

Switching Time Waveform



Switching Test Circuit



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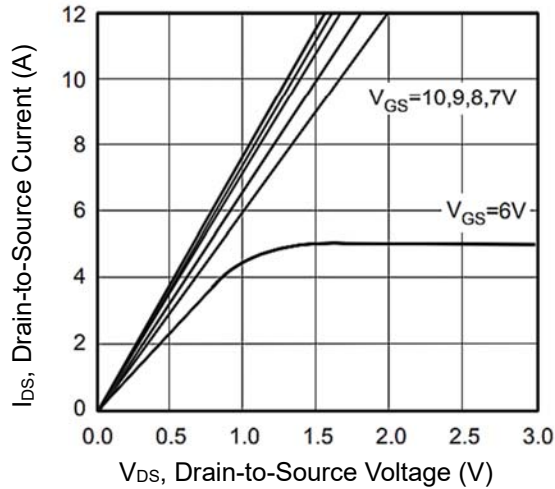
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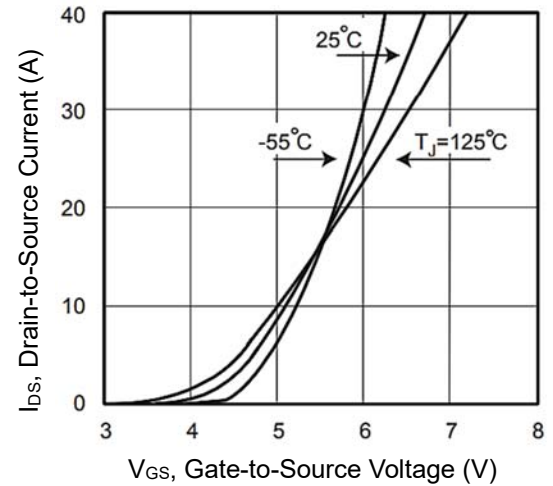
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CHARACTERISTIC CURVES

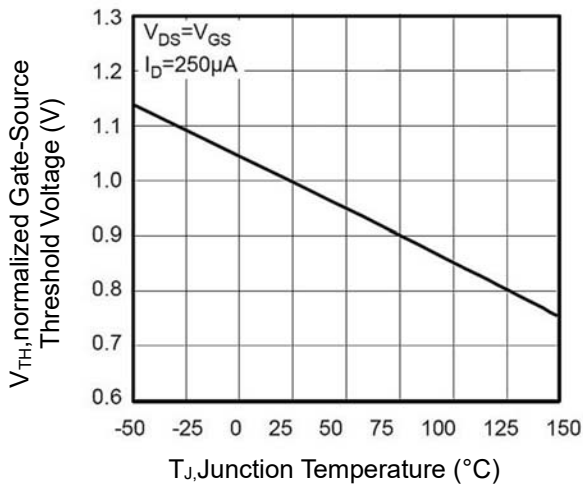
Output Characteristics



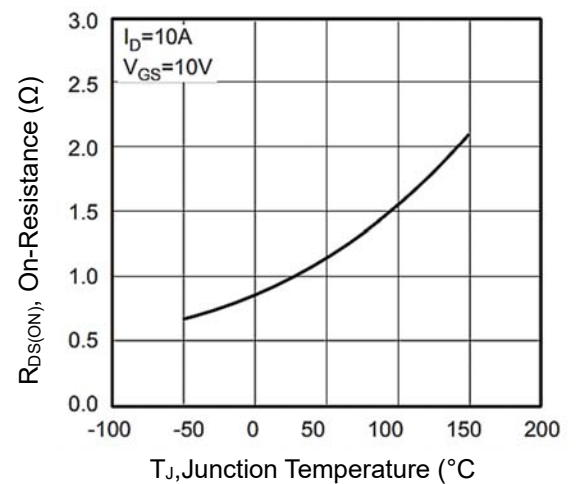
Transfer Characteristics



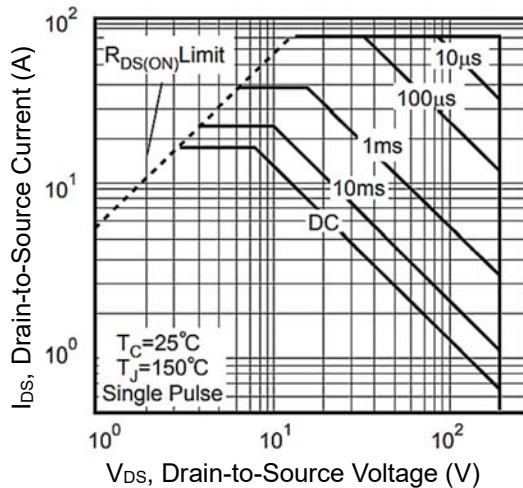
Threshold Voltage Variation with Temperature



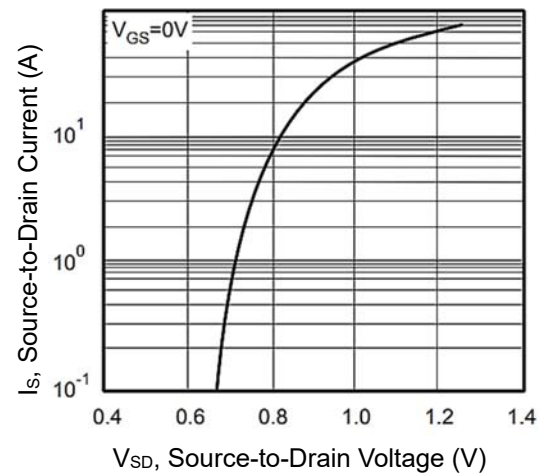
On-Resistance vs. Junction temperature



Maximum Safe Operating Area



Body Diode Characteristics



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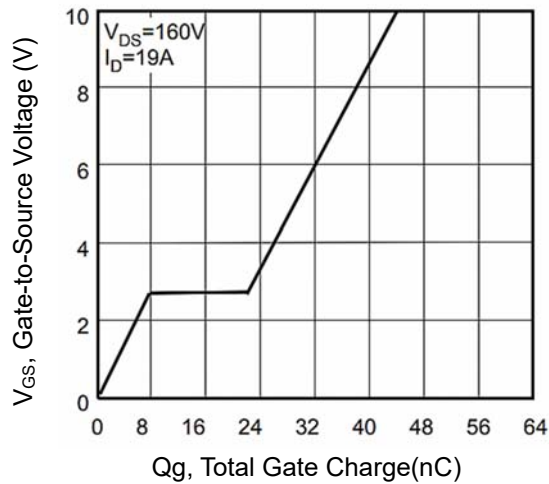
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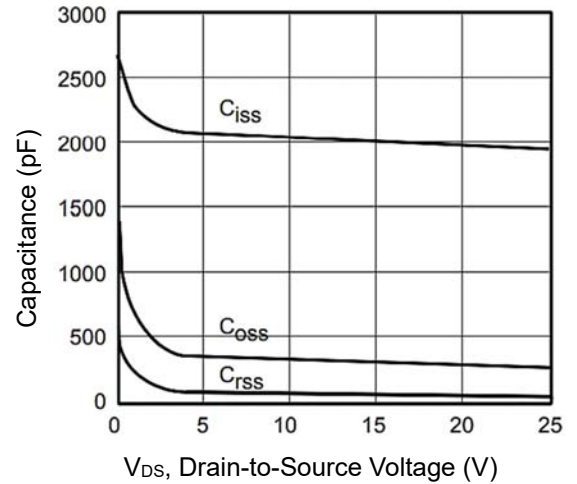
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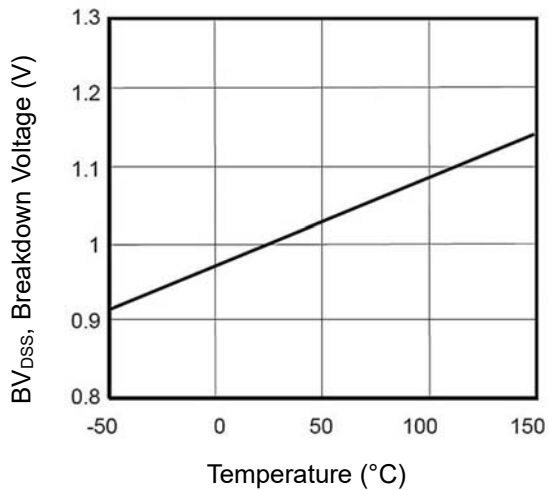
Gate-Charge Characteristics



Capacitance vs. Drain-Source Voltage



Breakdown Voltage vs. Temperature



Normalized Transient Thermal Impedance vs Pulse Width

