

N-Channel MOSFET

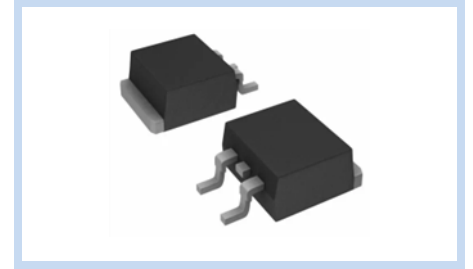
250V 80A TO-263

MFT25N80T263

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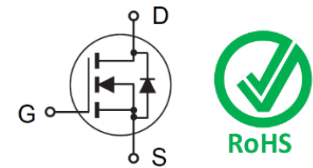
FEATURE

- $R_{DS(ON)} < 18.5m\Omega$ at $V_{GS}=10V, I_D=40A$
- High Power and Current Handling Capability
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- Application: DC/DC Converter, High-Frequency Switching and Synchronous Rectification



MECHANICAL DATA

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



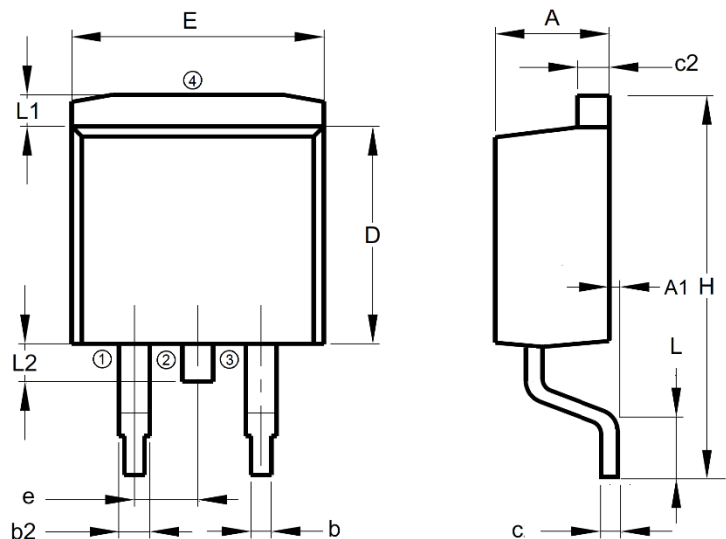
MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	250	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$T_C=25^\circ C$	I_D	80	A
Drain Current – Continuous	$T_C=100^\circ C$	I_D	56.6	A
Drain Current – Pulsed		I_{DM}	320	A
Power Dissipation		P_D	300	W
Single Pulsed Avalanche Energy		E_{AS}	1200	mJ
Thermal Resistance Junction to Case		$R_{\theta JC}$	0.5	$^\circ C/W$
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to 150	$^\circ C$

DIMENSIONS

Item	Min (mm)	Max (mm)
A	4.47	4.67
A1	--	0.15
b	0.71	0.91
b2	1.17	1.37
c	0.31	0.53
c2	1.17	1.37
D	8.50	8.90
E	10.01	10.31
e	2.54 TYP	
H	15.05	15.45
L	2.34	2.74
L1	1.17	1.37
L2	1.30	1.70

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



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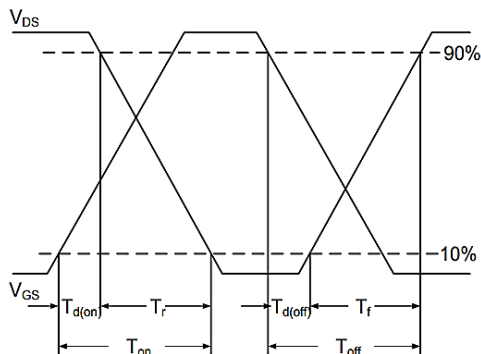
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	250	-	-	V
Drain-Source Leakage Current	$V_{DS}=0V, V_{GS}=250V$	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	$V_{GS}=10V, I_D=40A$	$R_{DS(ON)}$	-	16	18.5	m Ω
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	2.5	3.5	4.4	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=125V, V_{GS}=10V, I_D=40A$	Q_g	-	76.7	-	nC
Gate-Source Charge		Q_{gs}	-	22.7	-	
Gate-Drain Charge		Q_{gd}	-	20	-	
Turn-On Delay Time	$V_{DD}=125V, V_{GS}=10V, R_G=4.7\Omega, I_D=40A$	$T_{d(on)}$	-	18	-	ns
Rise Time		T_r	-	26	-	
Turn-Off Delay Time		$T_{d(off)}$	-	41	-	
Fall Time		T_f	-	11	-	
Input Capacitance	$V_{DS}=125V, V_{GS}=0V, F=1MHz$	C_{iss}	-	5400	-	pF
Output Capacitance		C_{oss}	-	329	-	
Reverse Transfer Capacitance		C_{rss}	-	12	-	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Diode Forward Current	--	I_S	-	-	80	A
Diode Forward Voltage	$V_{GS}=0V, I_S=80A, T_J=25^\circ C$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$T_J=25, I_F=40A, di/dt=100A/\mu s^2$	t_{rr}	-	140	-	nS
Reverse Recovery Charge		Q_{rr}	-	600	-	nC

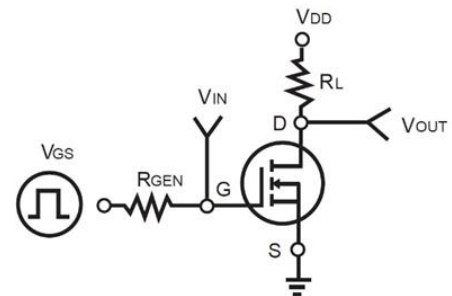
Note:

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. EAS condition: $T_J=25^\circ C, V_G=10V, V_{DD}=50V, R_G=25\Omega, L=0.5mH$

Switching Time Waveform



Switching Test Circuit



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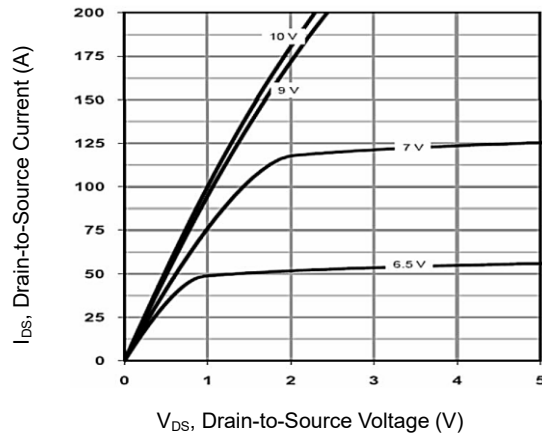
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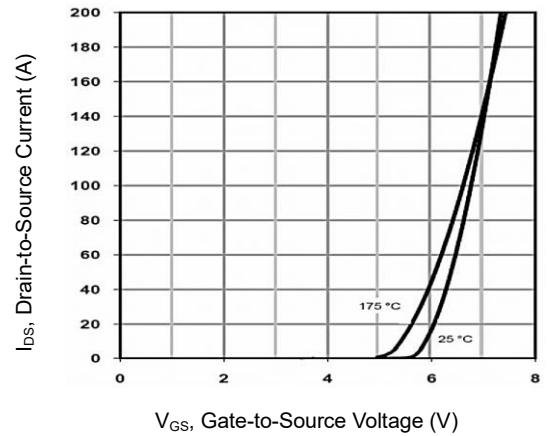
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CHARACTERISTIC CURVES

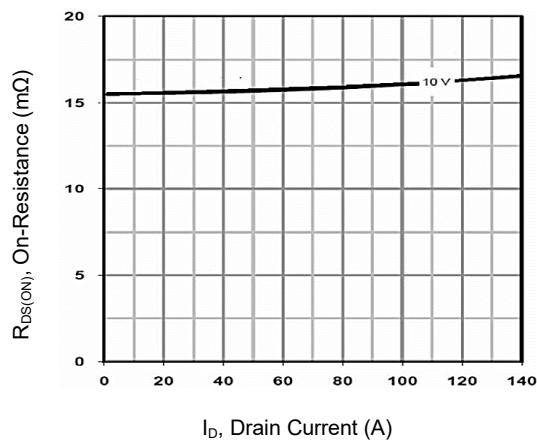
Output Characteristics



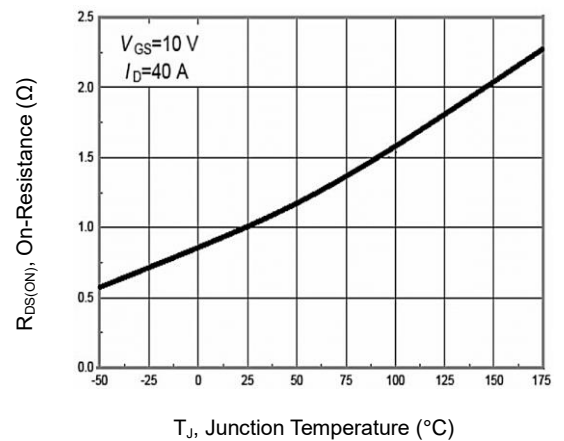
Transfer Characteristics



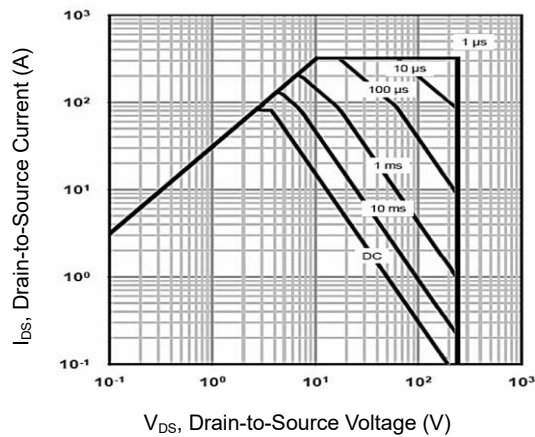
On-Resistance vs. Drain Current



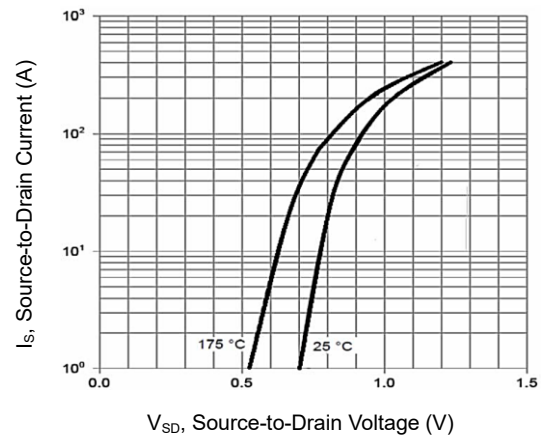
On-Resistance vs. Junction temperature



Maximum Safe Operating Area

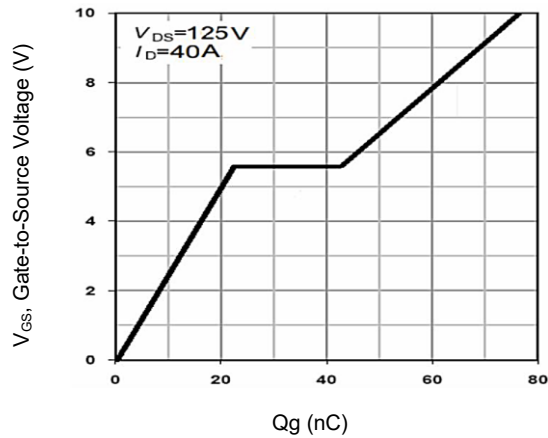


Body Diode Characteristics

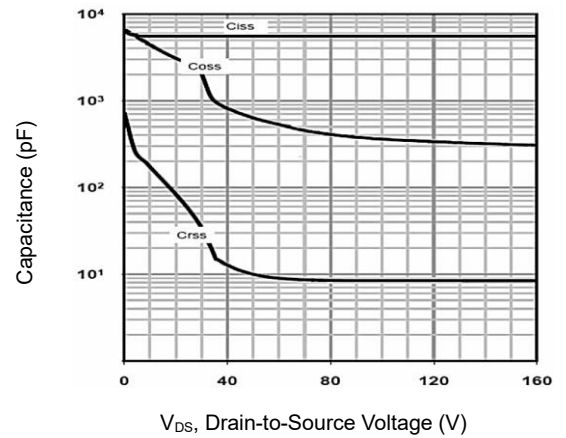


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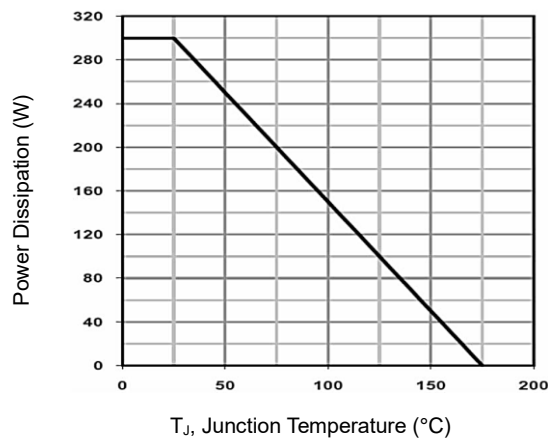
Gate-Charge Characteristics



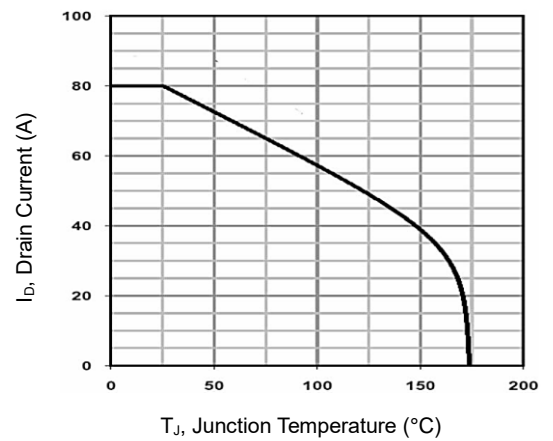
Capacitance vs. Drain-Source Voltage



Power De-rating



Current De-rating



Normalized Transient Thermal Impedance vs Pulse Width

