

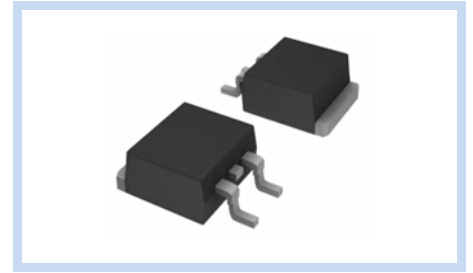
N-Channel MOSFET 100V 168A TO-263

MFT10N168T263

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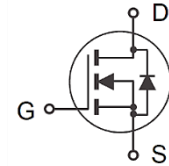
FEATURE

- $R_{DS(ON)} < 3.7m\Omega$ at $V_{GS}=10V$, $I_D=20A$
- Super-Junction Technology
- High Power and Current Handling Capability
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- Fast Switching Capability



MECHANICAL DATA

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



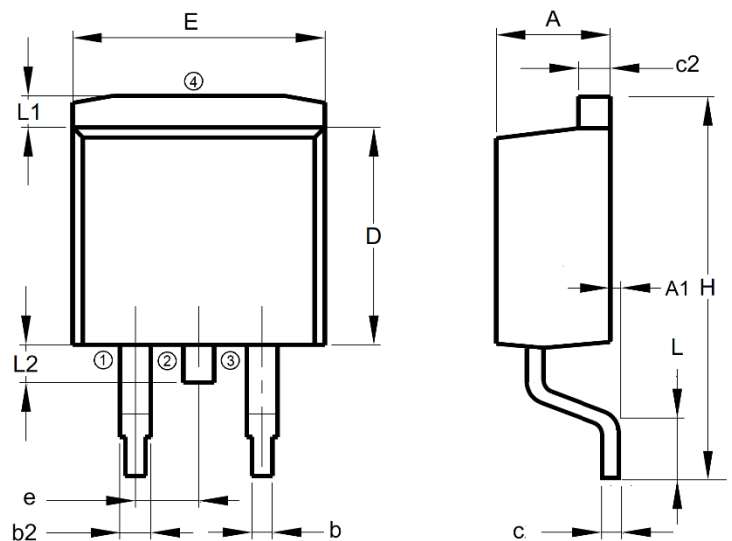
MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	$T_C=25^\circ C$	168
		$T_C=100^\circ C$	119
Drain Current – Pulsed	I_{DM}	672	A
Power Dissipation	P_D	$T_C=25^\circ C$	188
		Derate above $25^\circ C$	1.25
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.8	$^\circ C/W$
Operating Junction Temperature	T_J	-55 to 175	$^\circ C$
Storage Temperature Range	T_{STG}	-55 to 175	$^\circ C$

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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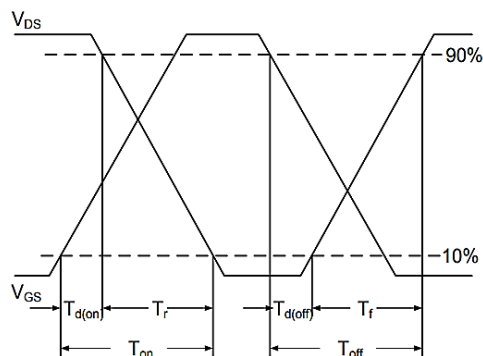
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	100	--	--	V
Drain Source Leakage Current	$V_{DS}=100V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate Source Leakage Current	$V_{GS}=20V, V_{DS}=0V$	I_{GSS}	--	--	100	nA
	$V_{GS}=-20V, V_{DS}=0V$		--	--	-100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2	--	4	V
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$	$R_{DS(on)}$	--	3.1	3.7	m Ω
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=20A$	Q_g	--	88	--	nC
Gate-Source Charge		Q_{gs}	--	17	--	
Gate-Drain Charge		Q_{gd}	--	31	--	
Turn-On Delay Time	$V_{DD}=50V, I_D=20A, V_{GS}=10V, R_{GEN}=10\Omega$	$T_{d(on)}$	--	38	--	nS
Turn-On Rise Time		T_r	--	30	--	
Turn-Off Delay Time		$T_{d(off)}$	--	86	--	
Turn-Off Fall Time		T_f	--	61	--	
Input Capacitance	$V_{DS}=50V, V_{GS}=0V, F=1.0MHz$	C_{iss}	--	3230	--	pF
Output Capacitance		C_{oss}	--	895	--	
Reverse Transfer Capacitance		C_{rss}	--	45	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Maximum Body-Diode Continuous Current	--	I_S	--	--	125	A
Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=10A$	V_{SD}	--	--	1.5	V

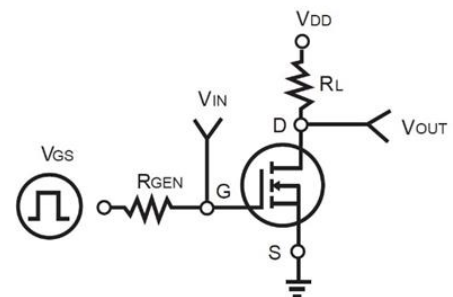
Note:

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. $L=1mH, I_{AS}=37A, V_{DD}=50V, R_G=25\Omega, \text{Starting } T_J=25^\circ C$.

Switching Time Waveform



Switching Test Circuit

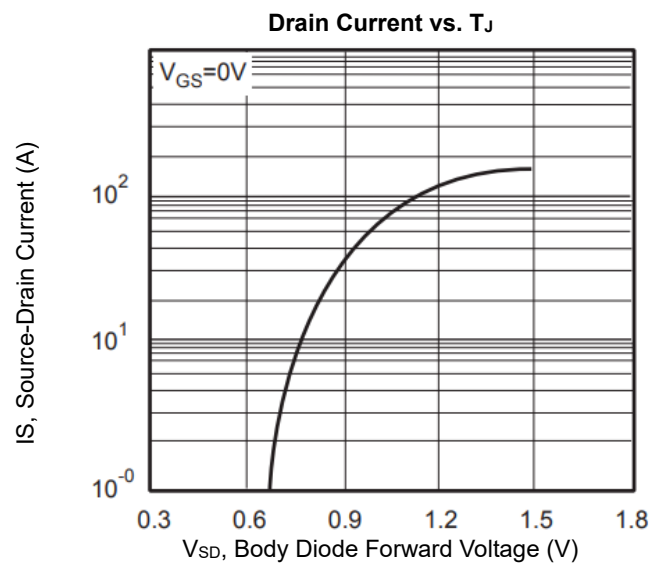
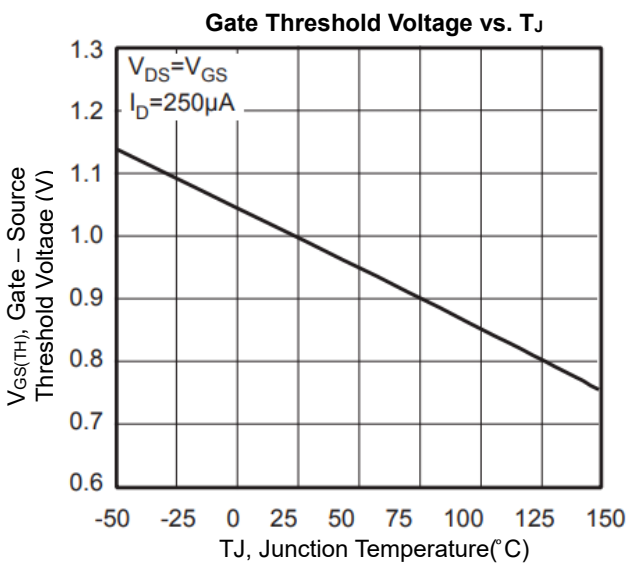
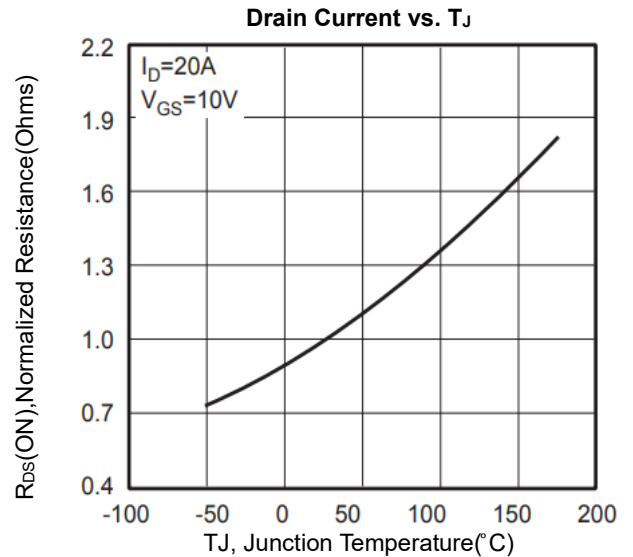
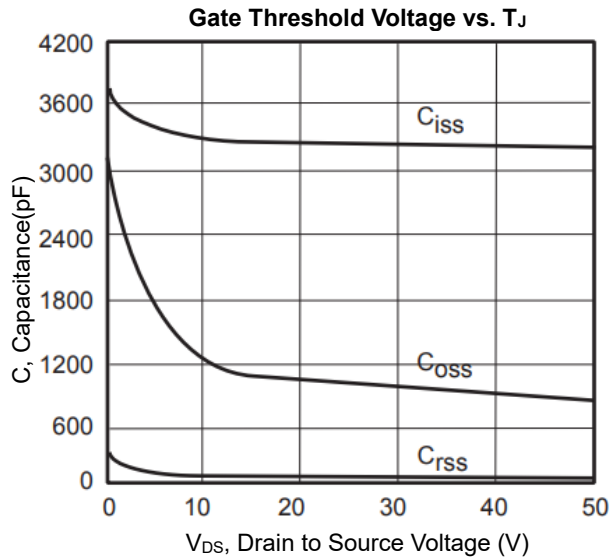
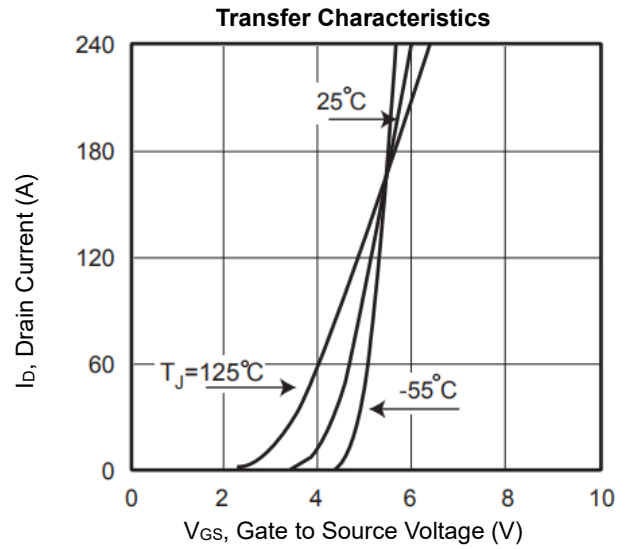
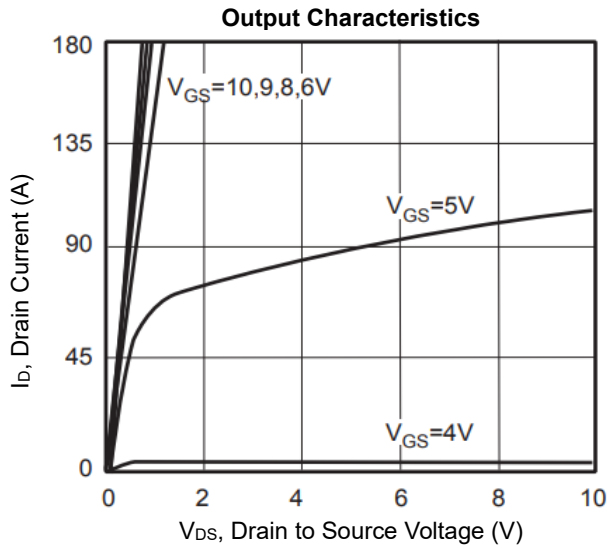


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CHARACTERISTIC CURVES

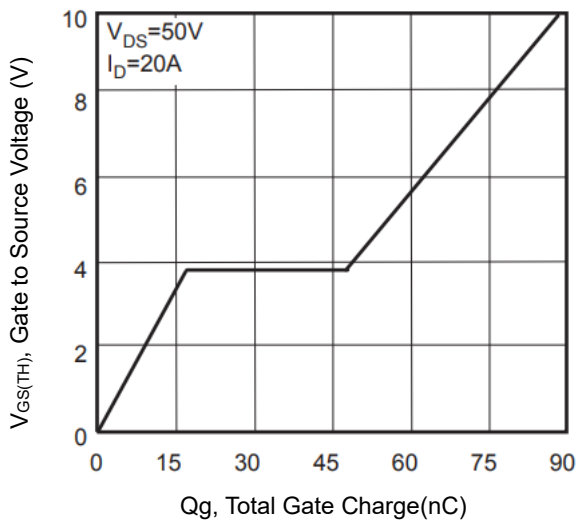


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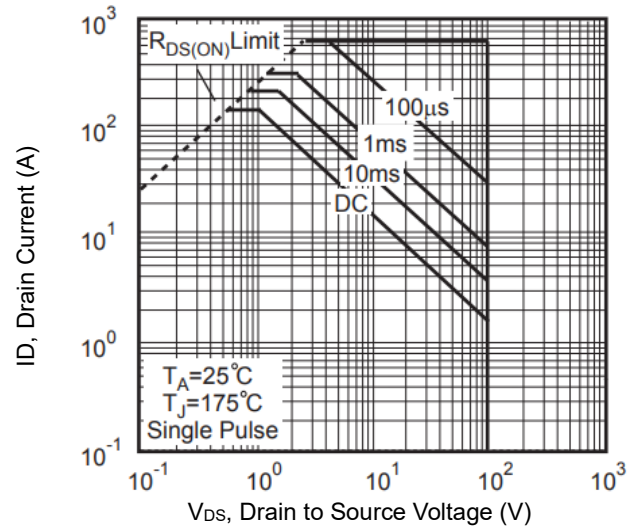
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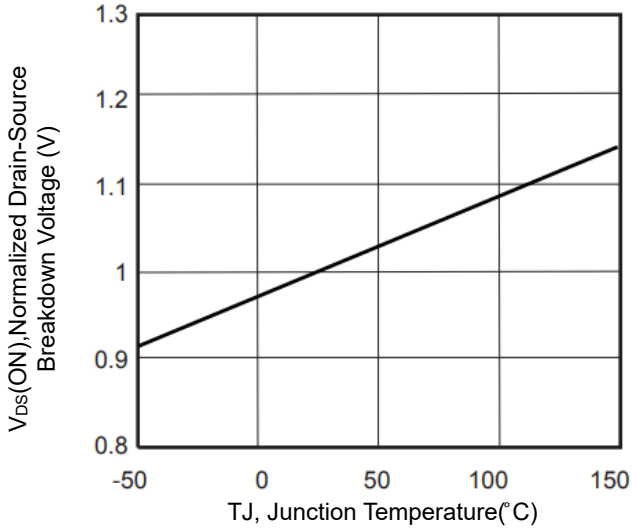
Gate Charge



Maximum Safe Operating Area



Gate Threshold Voltage vs. T_J



Normalized Thermal Transient Impedance Curve

