

# N-Channel MOSFET

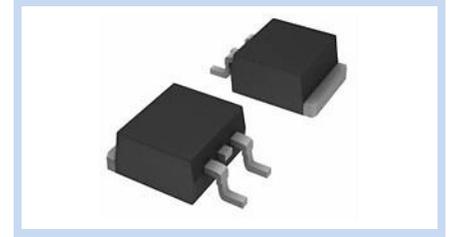
## 150V 125A 215w TO-263

MFT15N125T263

MERITEK

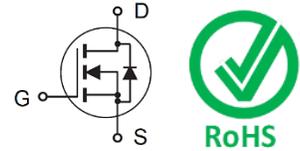
### FEATURE

- $R_{DS(ON)} < 7.2m\Omega$  at  $V_{GS}=10V$ ,  $I_D=20A$
- Fast Switch Speed
- Low Gate Charge
- 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



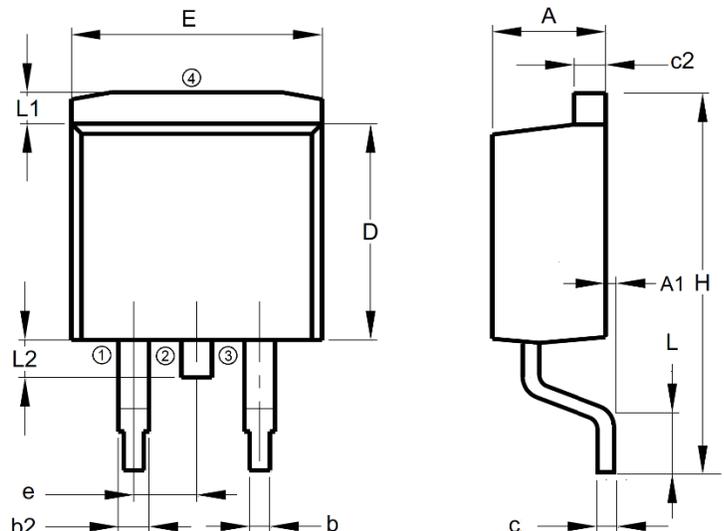
### MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	150	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current – Continuous	$I_D$	$T_C=25^\circ C$	125
		$T_C=100^\circ C$	79
Drain Current – Pulsed	$I_{DM}$	500	A
Power Dissipation	$P_D$	$T_C=25^\circ C$	215
		Derate above $25^\circ C$	1.72
Single Pulsed Avalanche Energy	$E_{AS}$	450	mJ
Single Pulsed Avalanche Current	$I_{AS}$	30	A
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.58	$^\circ C/W$
Operating Junction and Storage Temperature	$T_J, T_{STG}$	-55 to 150	$^\circ C$

### DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	4.29	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



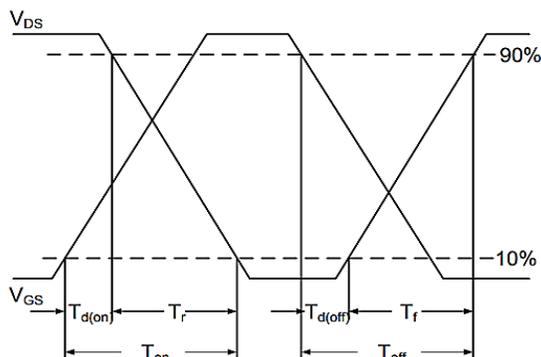
### ELECTRICAL CHARACTERISTICS

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	$\mu A$
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	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	--	6.3	7.2	m $\Omega$
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	$V_{DS}=75V, V_{GS}=10V, I_D=20A$	$Q_g$	--	67	--	nC
Gate-Source Charge		$Q_{gs}$	--	19	--	
Gate-Drain Charge		$Q_{gd}$	--	11	--	
Turn-On Delay Time	$V_{DD}=75V, V_{GS}=10V, R_G=10\Omega, I_D=20A$	$T_{d(on)}$	--	34	--	ns
Rise Time		$T_r$	--	25	--	
Turn-Off Delay Time		$T_{d(off)}$	--	88	--	
Fall Time		$T_f$	--	36	--	
Input Capacitance	$V_{DS}=75V, V_{GS}=0V, F=1MHz$	$C_{iss}$	--	3415	--	pF
Output Capacitance		$C_{oss}$	--	390	--	
Reverse Transfer Capacitance		$C_{rss}$	--	5	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Diode Forward Current	--	$I_S$	--	--	125	A
Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	$V_{SD}$	--	--	1.2	V
Reverse Recovery Time	$I_F=20A, di/dt=100A/\mu s$	$T_{rr}$	--	85	--	ns
Reverse Recovery Charge		$Q_{rr}$	--	140	--	$\mu C$

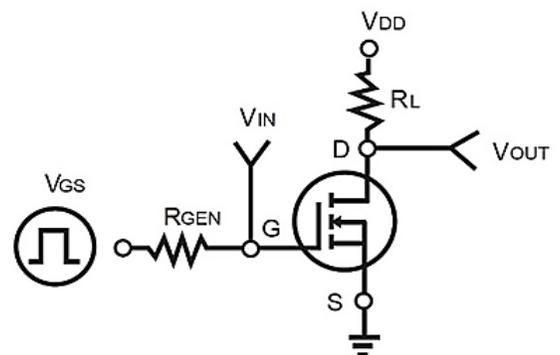
Note:

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  $I_{S(Max)} = 72A$
7. Full package  $V_{SD}$  test condition  $I_S = 72A$
8.  $L=1mH, I_{AS} = 30A, V_{DD} = 50V, R_G=25\Omega$ , Starting  $T_J=25^\circ C$

Switching Time Waveform

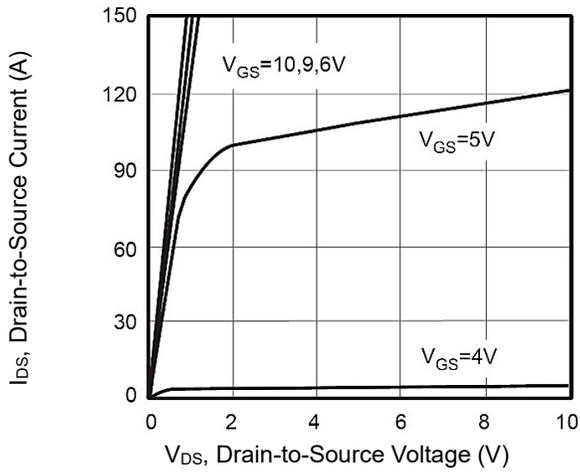


Switching Test Circuit

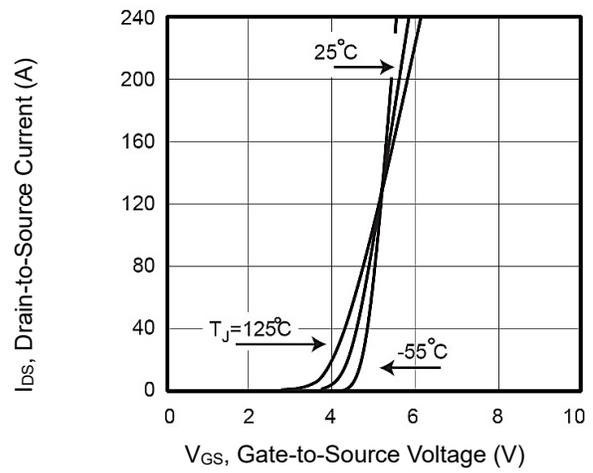


**CHARACTERISTIC CURVES**

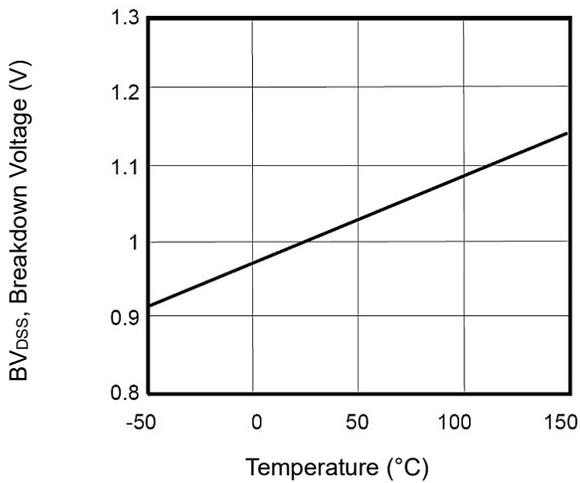
**Output Characteristics**



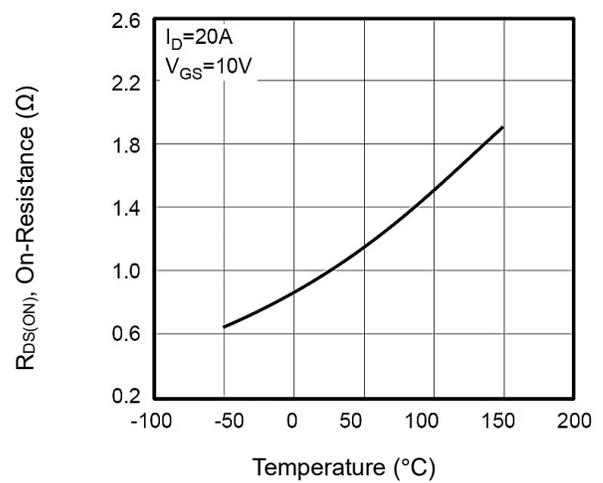
**Transfer Characteristics**



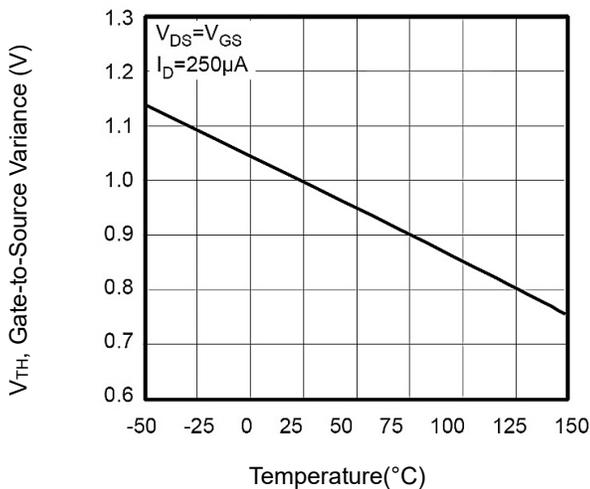
**Breakdown Voltage vs. Temperature**



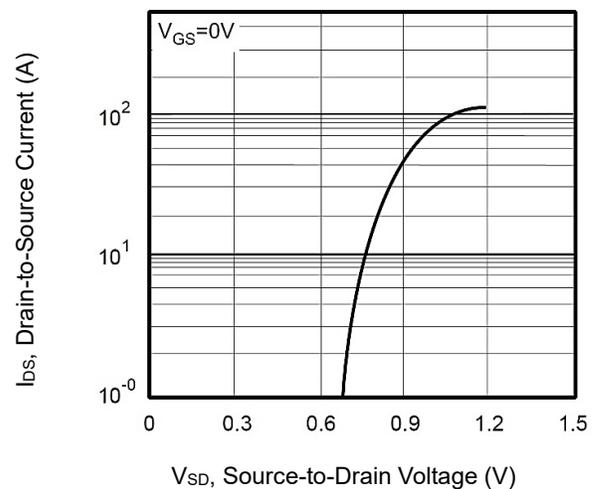
**On-Resistance vs. Junction temperature**



**Threshold Voltage Variance vs. Temperature**

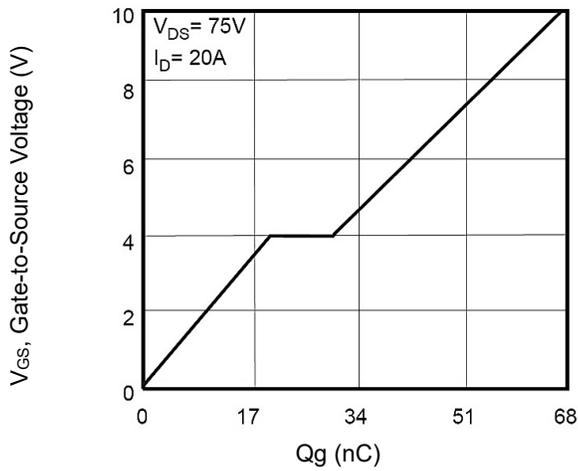


**Body Diode Characteristics**

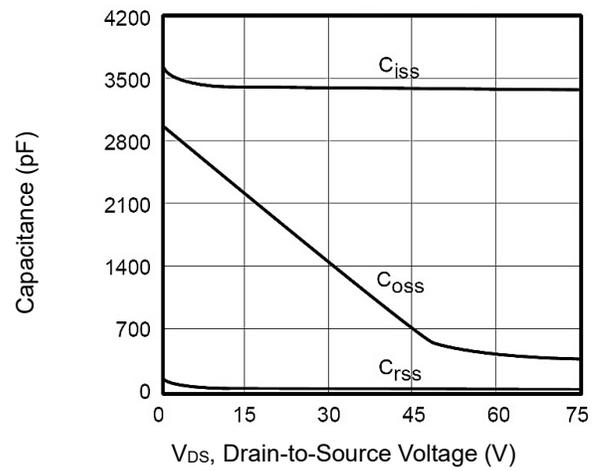


**CHARACTERISTIC CURVES**

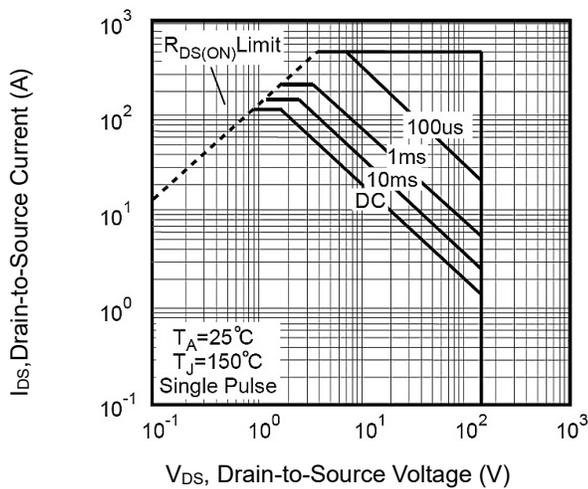
**Gate-Charge Characteristics**



**Capacitance vs. Drain-Source Voltage**



**Maximum Safe Operating Area**



**Normalized Transient Thermal Impedance vs Pulse Width**

