

N-Channel MOSFET

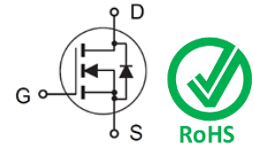
150V 300A 600W TO-263-7

MFT15N300T2637

MERITEK

FEATURE

- $R_{DS(ON)} \leq 4.2m\Omega$ at $V_{GS}=10V$
- Low Gate Charge
- Excellent Low $R_{DS(ON)}$
- Application: DC/DC Converter, LED Backlighting, Power Management Switches



MECHANICAL DATA

- Case: TO-263-7 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

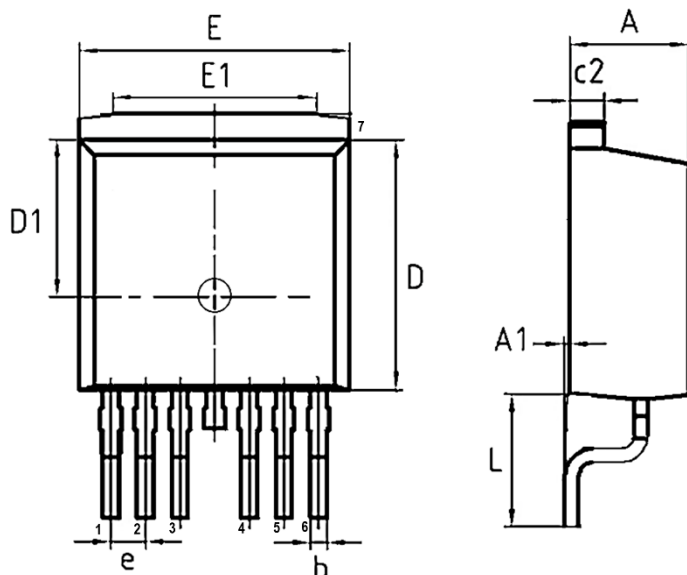
MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$V_{GS}=10V, T_C=25^\circ C$	I_D	300	A
	$V_{GS}=10V, T_C=100^\circ C$		188	
Drain Current – Pulsed		I_{DM}	817	A
Single Pulse Avalanche Energy		E_{AS}	2201	mJ
Power Dissipation		P_D	600	W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.21	$^\circ C/W$
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^\circ C$

DIMENSIONS

Item	Min (mm)	Max (mm)
A	4.42	4.58
A1	0.00	0.20
b	0.55	0.65
c2	1.27	1.33
D	9.09	9.29
D1	4.50	4.70
e	1.23	1.31
E	9.88	10.08
E1	7.70	8.30
L	4.70	5.10

Note:
Pin Layout: 1:Gate; 2,3,4,5,6:Source; 7:Drain



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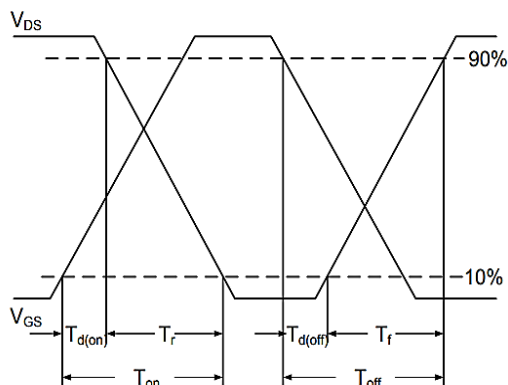
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	150	--	--	V
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	$V_{GS(th)}$	2.5	3.2	4.5	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	I_{GSS}	--	--	± 0.1	μA
Zero Gate Voltage Drain Current	$V_{DS}=150V, V_{GS}=0V$	I_{DSS}	--	--	1.0	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=40A$	$R_{DS(ON)}$	--	3.3	4.2	m Ω
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Input Capacitance	$V_{DS}=25V, V_{GS}=0V, F=1.0MHz$	C_{iss}	--	6540	--	pF
Output Capacitance		C_{oss}	--	772	--	
Reverse Transfer Capacitance		C_{rss}	--	6.7	--	
Turn-On Delay Time	$V_{DS}=75V, V_{GS}=10V, R_G=6\Omega, R_L=3.75\Omega$	$T_{d(on)}$	--	48	--	nS
Rise Time		T_r	--	90	--	
Turn-Off Delay Time		$T_{d(off)}$	--	94	--	
Fall Time		T_f	--	60	--	
Total Gate Charge	$V_{DS}=75V, V_{GS}=10V, I_D=20A$	Q_g	--	88	--	nC
Gate-Source Charge		Q_{gs}	--	32	--	
Gate-Drain Charge		Q_{gd}	--	16	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Voltage	$I_S=1A, V_{GS}=0V$	V_{SD}	--	--	1.0	V
Diode Forward Current	$T_C=25^\circ C$	I_S	--	--	300	A
Reverse Recovery Time	$I_{DS}=20A, di/dt=500A/\mu s$	t_{rr}	--	122	--	nS
Reverse Recovery Charge		Q_{rr}	--	279	--	nC

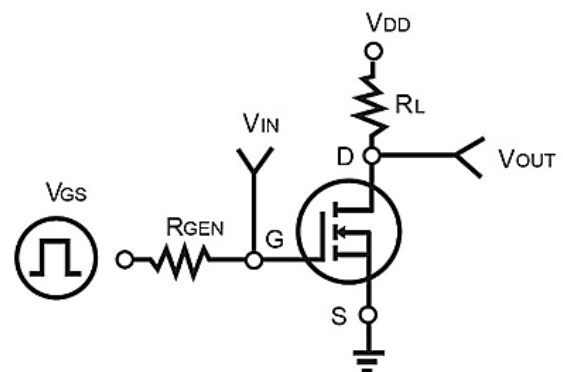
Note:

- $T_C = 25^\circ C$ unless otherwise noted.
- Pulse test: Pulse width < 300 μs , Duty cycle < 2%.
- The E_{AS} data shows Max. rating. The test condition is $V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=88A$
- Device mounted on 1 inch square FR-4 board with 2oz copper.
- The power dissipation is limited by junction temperature $T_J=150^\circ C$.

Switching Time Waveform

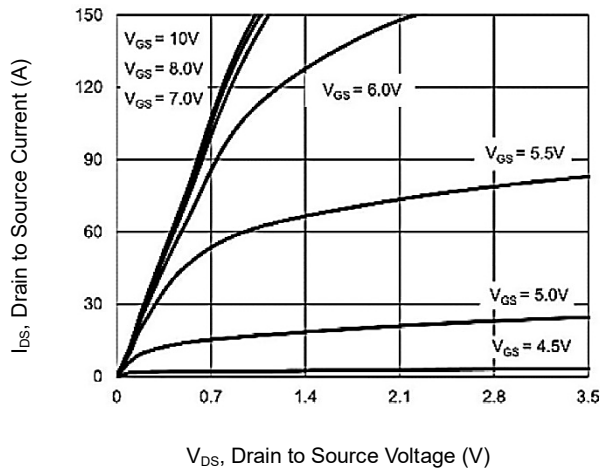


Switching Test Circuit

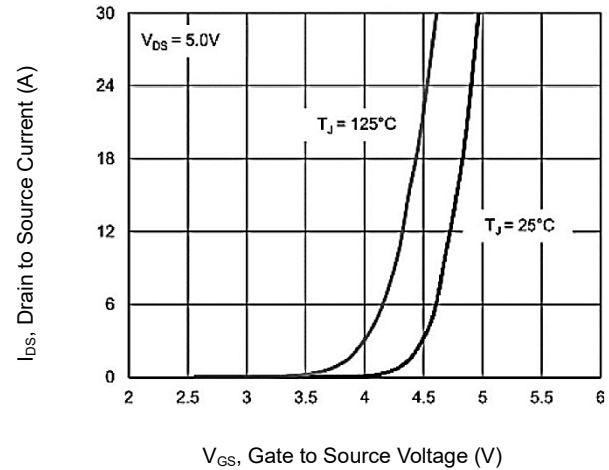


CHARACTERISTIC CURVES

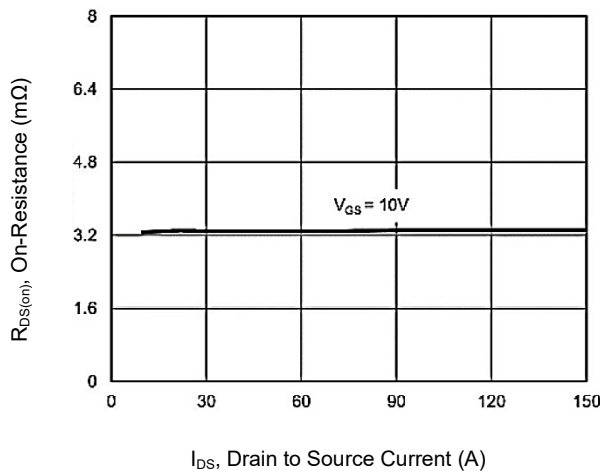
On-Region Characteristic



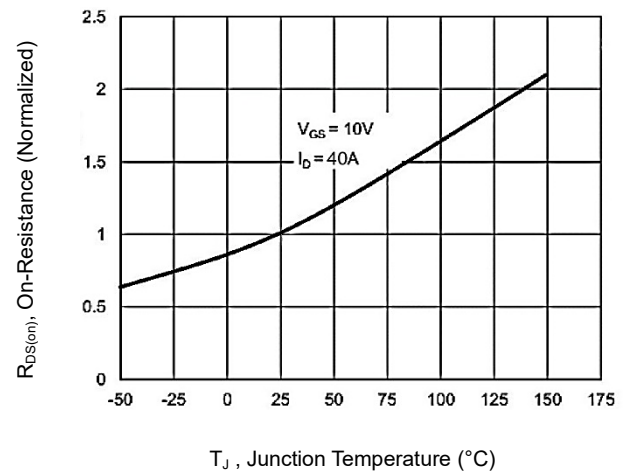
Transfer Characteristics



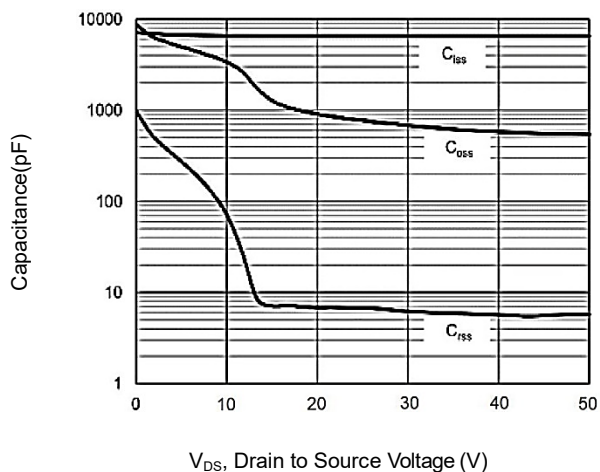
On-Resistance vs. Drain Current



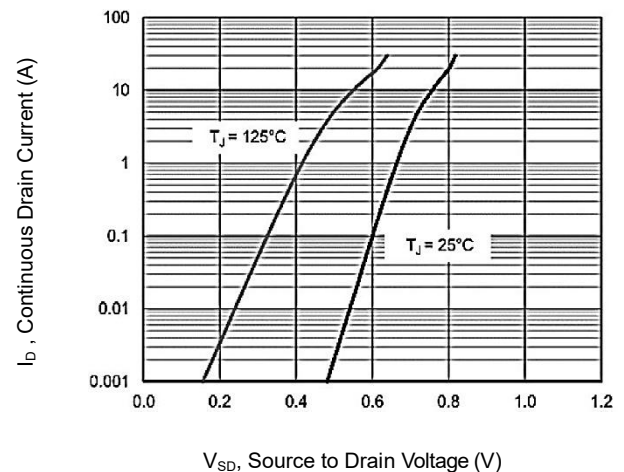
On-Resistance vs. Junction Temperature



Capacitance vs. Drain-Source Voltage



Source-Drain Diode Forward Voltage



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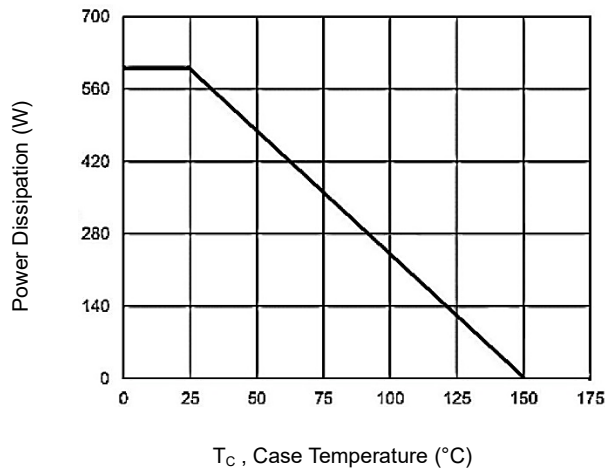
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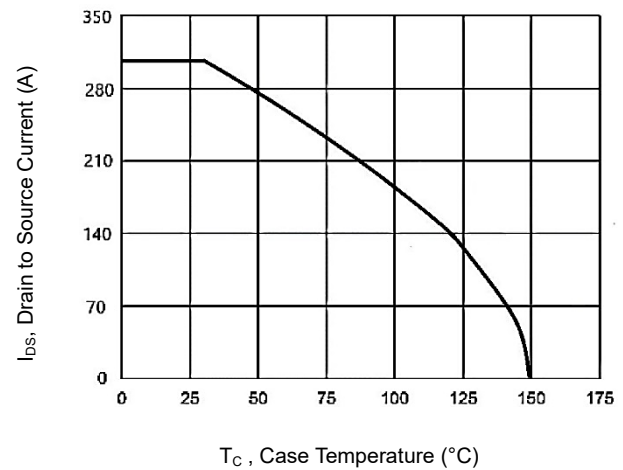
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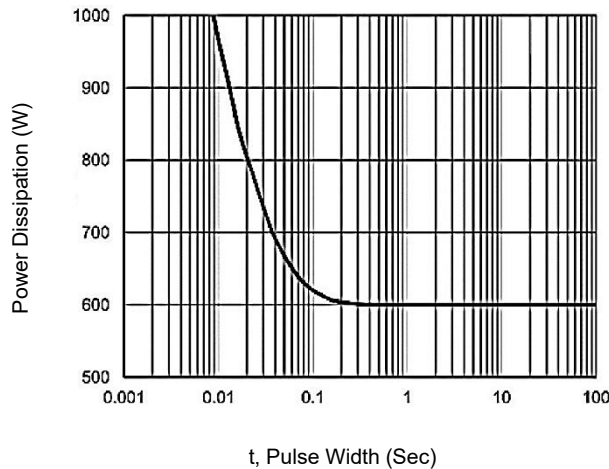
Power Dissipation



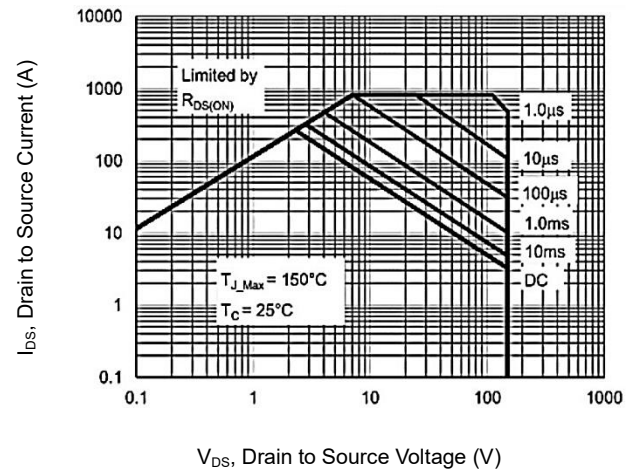
Drain Current



Single Pulse Power Rating



Maximum Safe Operating Area



Normalized Transient Thermal Impedance

