

N-Channel 500-V (D-S) MOSFET

Key Features:

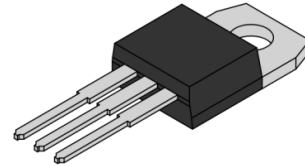
- Low $r_{DS(on)}$ technology
- Low thermal impedance
- Fast switching speed

Typical Applications:

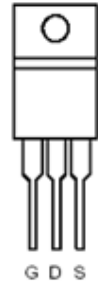
- Electronic ballast
- Electronic transformer
- Switch mode power supply



RoHS
COMPLIANT
HALOGEN
FREE



TO-220



PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
500	1.5 @ $V_{GS} = 10V$	4.5

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	500	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ^a	$T_C = 25^\circ\text{C}$	I_D	4.5	A
Pulsed Drain Current ^b		I_{DM}	18	
Continuous Source Current (Diode Conduction) ^a		I_S	4.5	A
Power Dissipation ^a	$T_C = 25^\circ\text{C}$	P_D	74	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient ^a	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Maximum Junction-to-Case	$R_{\theta JC}$	1.7	

Notes

- Package limited
- Pulse width limited by maximum junction temperature

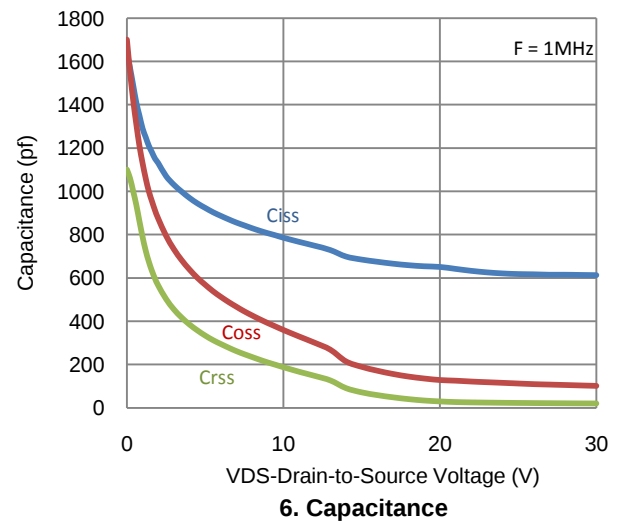
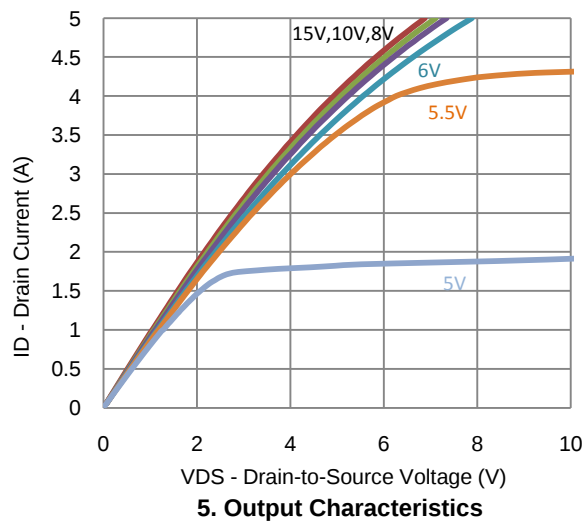
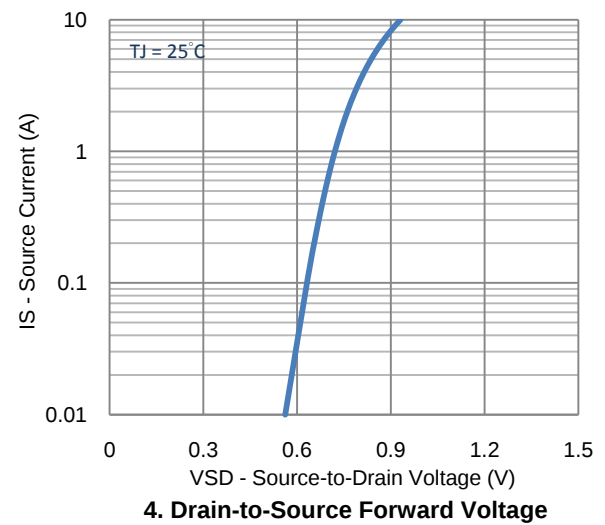
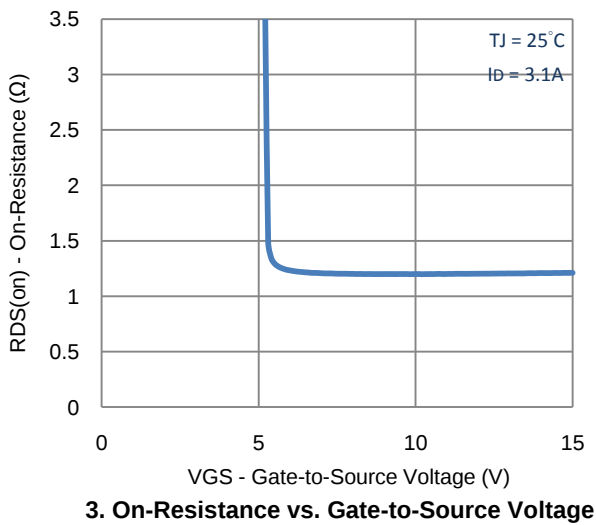
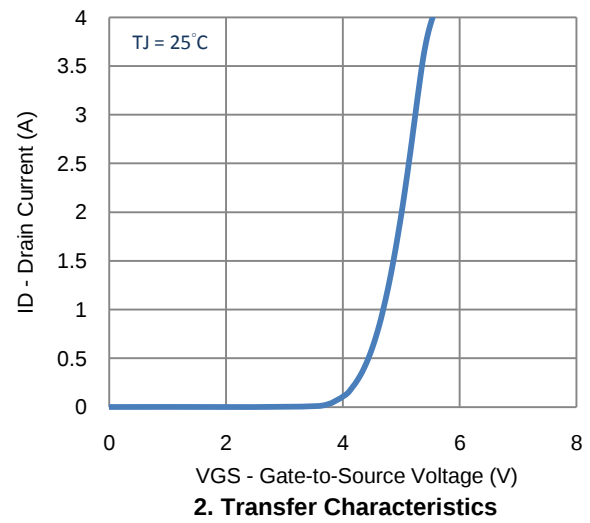
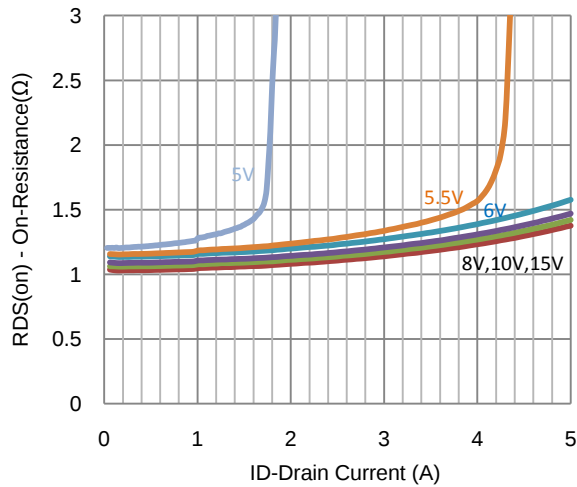
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu A$	2		4	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V$, $V_{GS} = \pm 20 V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 500 V$, $V_{GS} = 0 V$			25	μA
		$V_{DS} = 400 V$, $V_{GS} = 0 V$, $T_J = 125^\circ C$			250	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 10 V$, $V_{GS} = 10 V$	5			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 V$, $I_D = 2.7 A$			1.5	Ω
Forward Transconductance	g_{fs}	$V_{DS} = 50 V$, $I_D = 2.7 A$		2.5		S
Diode Forward Voltage	V_{SD}	$I_S = 4.5 A$, $V_{GS} = 0 V$		1.6		V
Dynamic						
Total Gate Charge	Q_g	$V_{DS} = 400 V$, $V_{GS} = 10 V$, $I_D = 3.1 A$		26		nC
Gate-Source Charge	Q_{gs}			4		
Gate-Drain Charge	Q_{gd}			15		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 250 V$, $R_L = 79 \Omega$, $I_D = 3.1 A$, $V_{GEN} = 10 V$, $R_{GEN} = 12 \Omega$		12.8		ns
Rise Time	t_r			7.4		
Turn-Off Delay Time	$t_{d(off)}$			38.0		
Fall Time	t_f			19.6		
Input Capacitance	C_{iss}	$V_{DS} = 25 V$, $V_{GS} = 0 V$, $f = 1 MHz$		623		pF
Output Capacitance	C_{oss}			112		
Reverse Transfer Capacitance	C_{rss}			24		

Notes

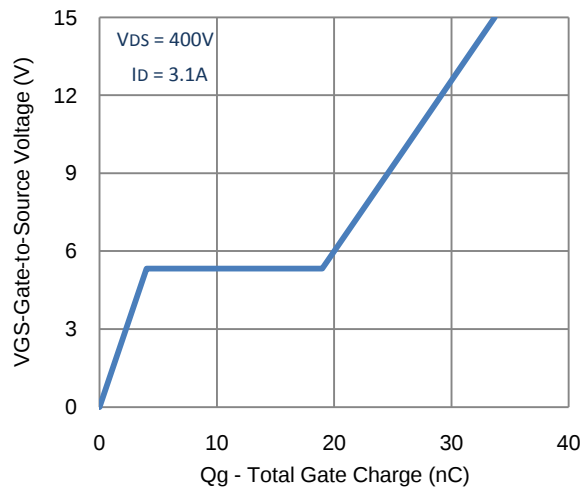
- Pulse test: $PW \leq 300 \mu s$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

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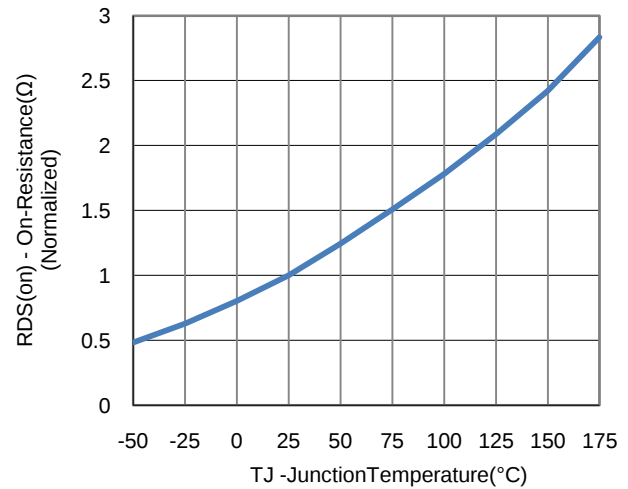
Typical Electrical Characteristics



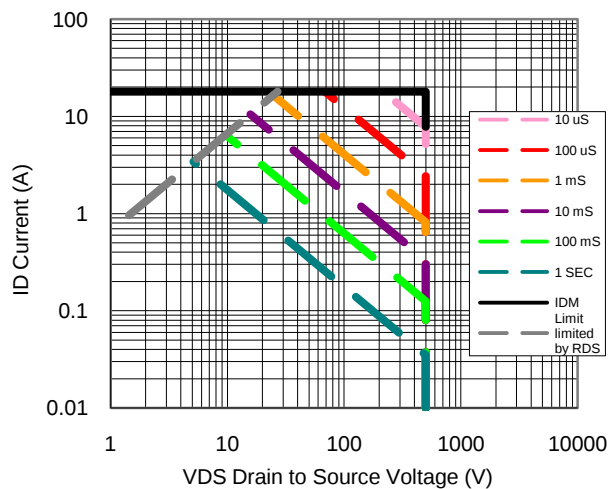
Typical Electrical Characteristics



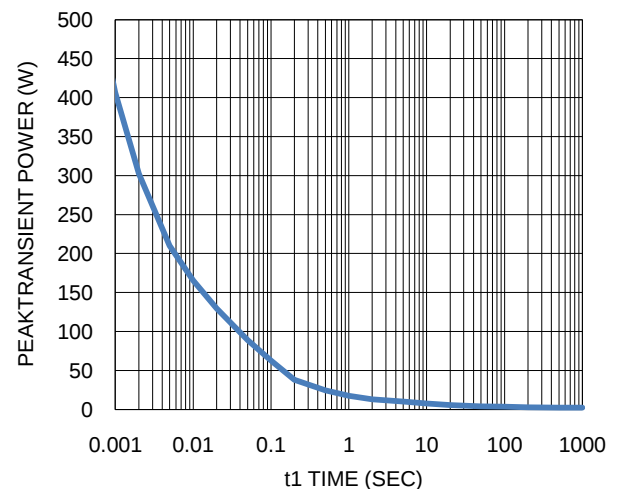
7. Gate Charge



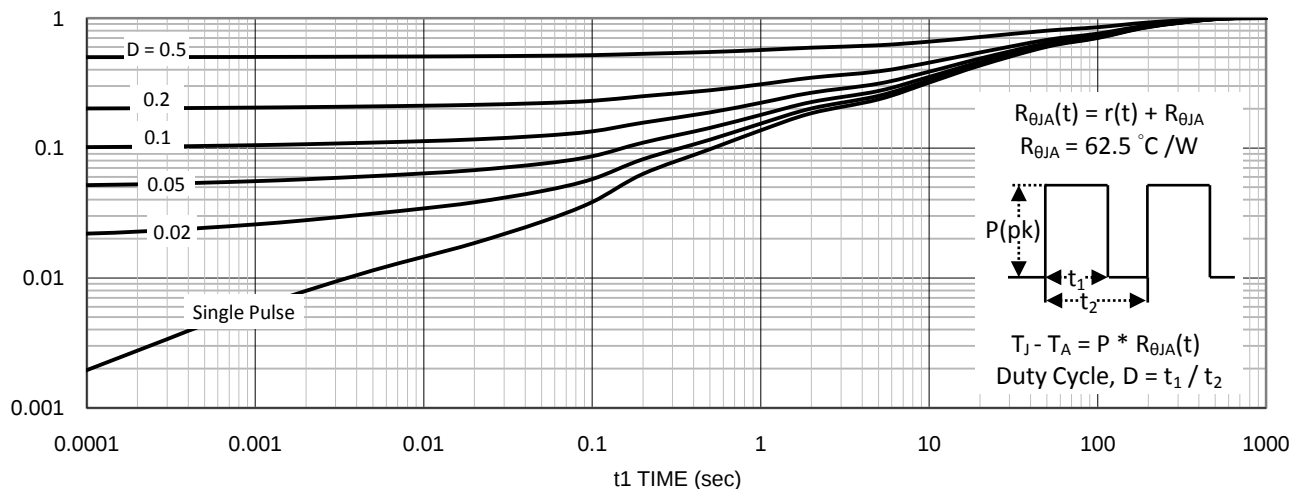
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



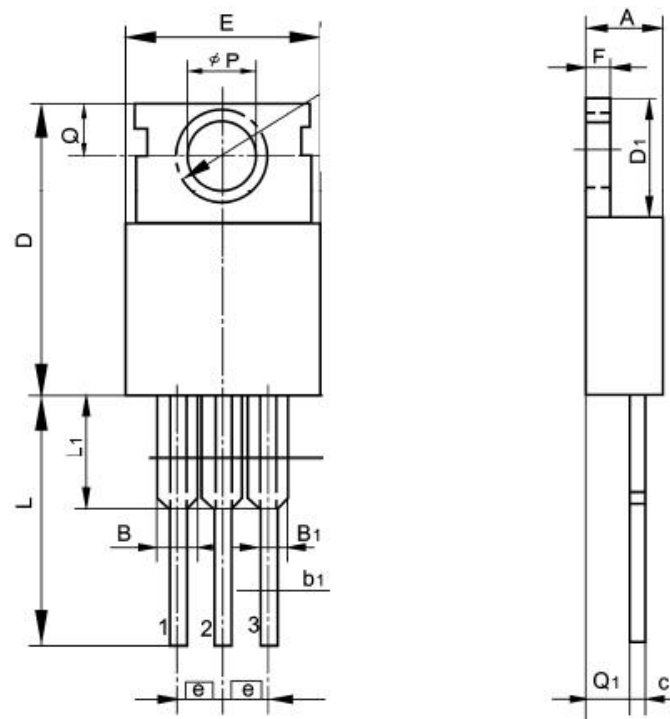
10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information

TO-220



Symbol	Min	Max	Typical	Symbol	Min	Max	Typical
A	4	4.8	--	E	9.9	10.7	--
B	1.2	1.4	--	e	--	--	--
B1	1	1.3	--	F	1.1	1.4	--
b1	0.65	1	--	L	12.5	14.5	--
C	0.4	0.55	--	L1	3	4	--
D	15	16.5	--	Q	2.5	3	--
D1	5.9	6.9	--	Q1	2	2.9	--
				P	--	--	3.8