

N-Channel 30-V (D-S) MOSFET

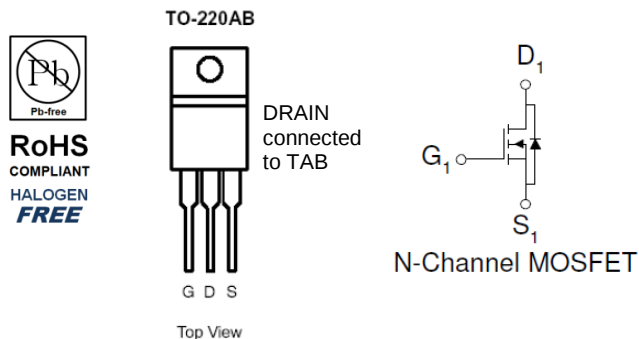
Key Features:

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

Typical Applications:

- Automotive Systems
- DC/DC Conversion Circuits
- Battery Powered Power Tools

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
30	3.5 @ $V_{GS} = 10V$	90 ^a
	4.6 @ $V_{GS} = 4.5V$	



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ^a	$T_C = 25^\circ\text{C}$	I_D	90	A
Pulsed Drain Current ^b		I_{DM}	360	
Continuous Source Current (Diode Conduction) ^a	$T_C = 25^\circ\text{C}$	I_S	90	A
Power Dissipation ^a	$T_C = 25^\circ\text{C}$	P_D	300	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	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Maximum Junction-to-Case	$R_{\theta JC}$	0.5	

Notes

- Package Limited
- Pulse width limited by maximum junction temperature

Electrical Characteristics

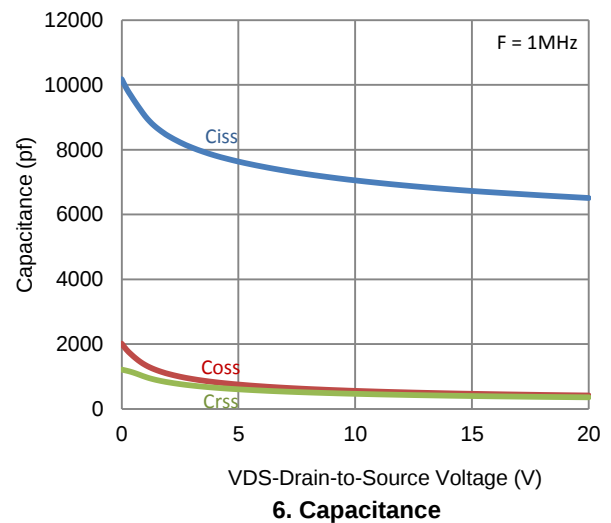
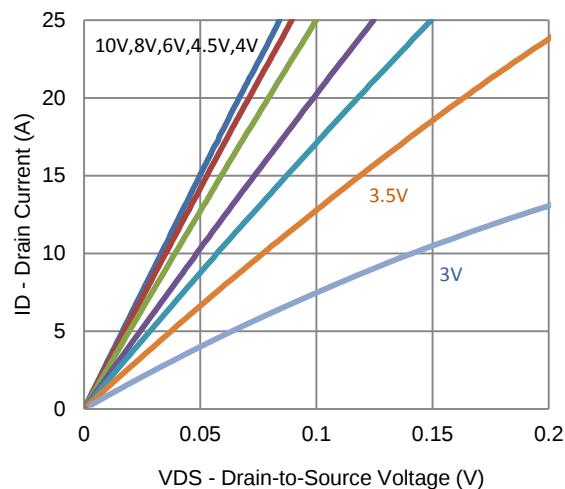
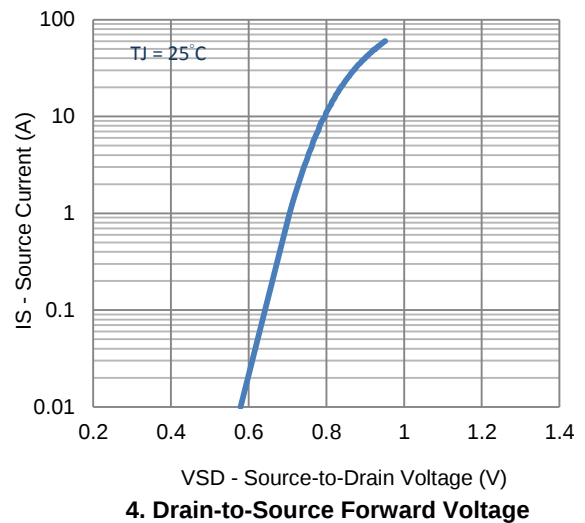
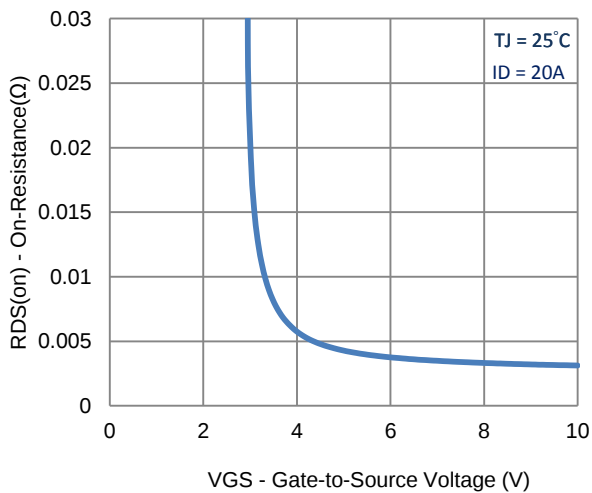
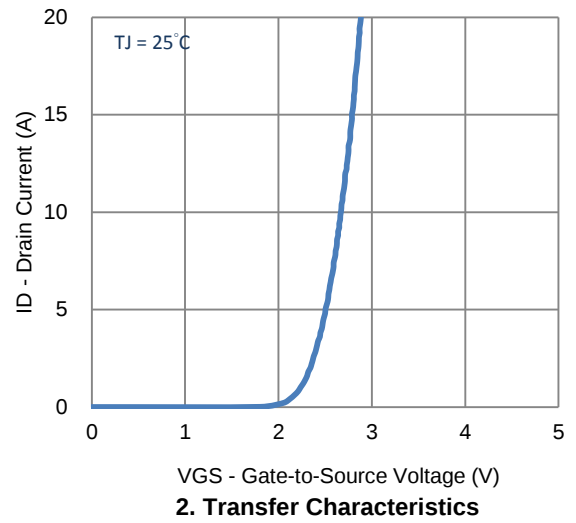
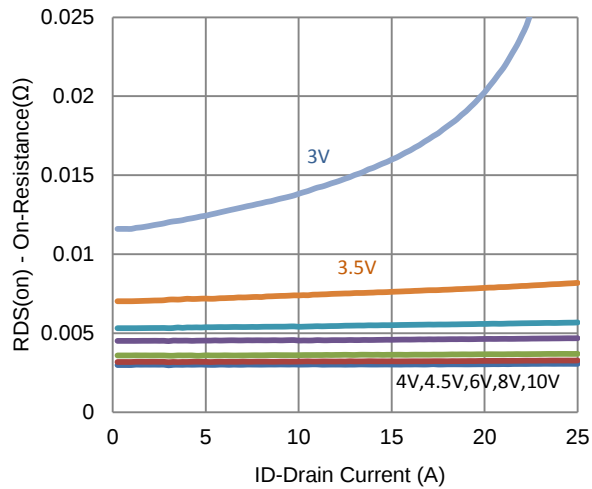
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu A$	1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V$, $V_{GS} = \pm 20 V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24 V$, $V_{GS} = 0 V$			1	μA
		$V_{DS} = 24 V$, $V_{GS} = 0 V$, $T_J = 55^\circ C$			25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5 V$, $V_{GS} = 10 V$	120			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10 V$, $I_D = 45 A$			3.5	m Ω
		$V_{GS} = 4.5 V$, $I_D = 44 A$			4.6	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15 V$, $I_D = 20 A$		20		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 45 A$, $V_{GS} = 0 V$		0.92		V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = 15 V$, $V_{GS} = 4.5 V$, $I_D = 20 A$		36		nC
Gate-Source Charge	Q_{gs}			12		
Gate-Drain Charge	Q_{gd}			13		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 15 V$, $R_L = 0.8 \Omega$, $I_D = 20 A$, $V_{GEN} = 10 V$, $R_{GEN} = 6 \Omega$		12		ns
Rise Time	t_r			15		
Turn-Off Delay Time	$t_{d(off)}$			89		
Fall Time	t_f			30		
Input Capacitance	C_{iss}	$V_{DS} = 15 V$, $V_{GS} = 0 V$, $f = 1 Mhz$		6725		pF
Output Capacitance	C_{oss}			466		
Reverse Transfer Capacitance	C_{rss}			397		

Notes

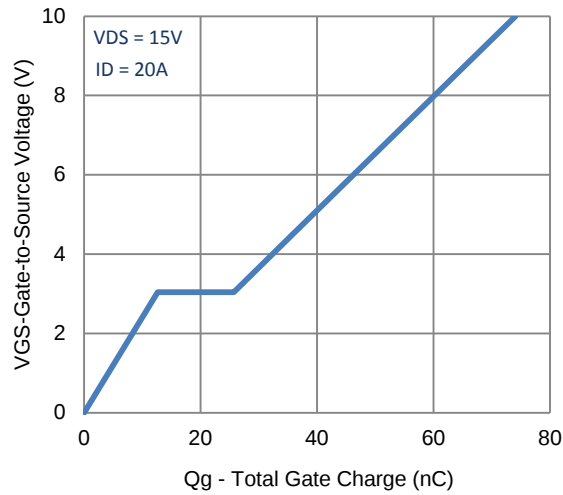
- a. Pulse test: $PW \leq 300 \mu s$ duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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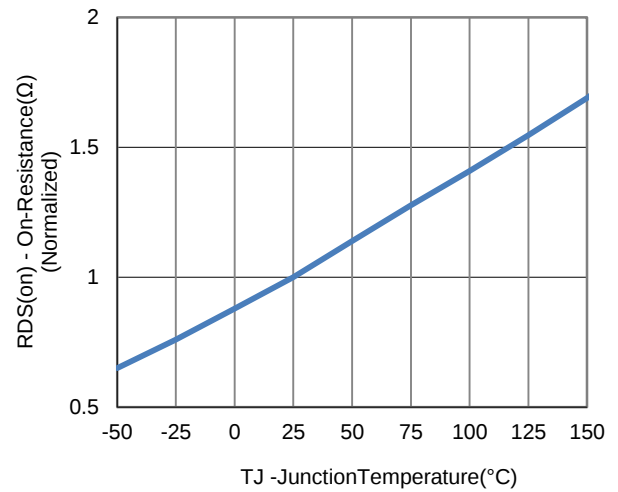
Typical Electrical Characteristics



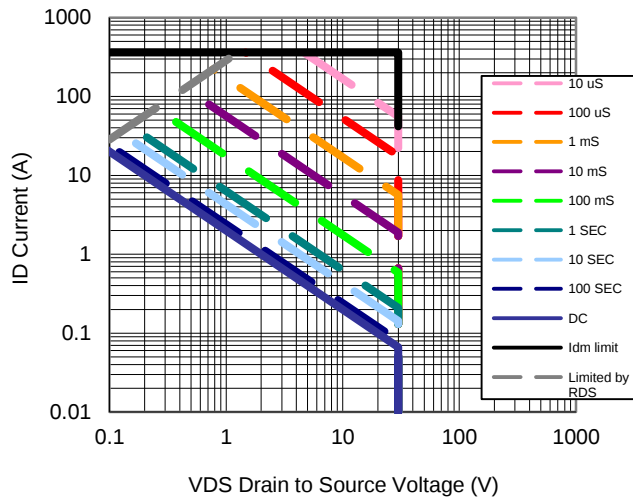
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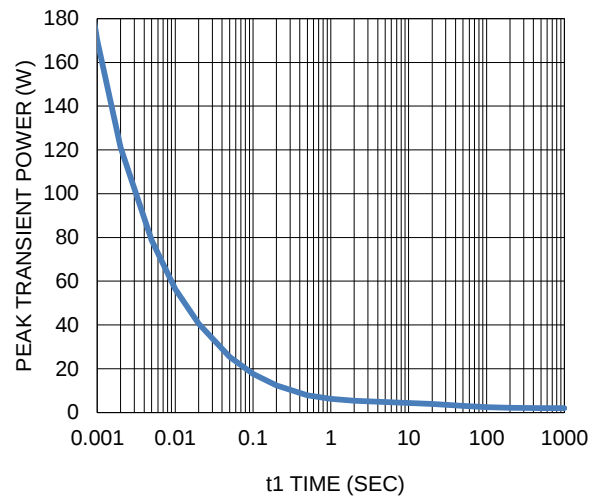
7. Gate Charge



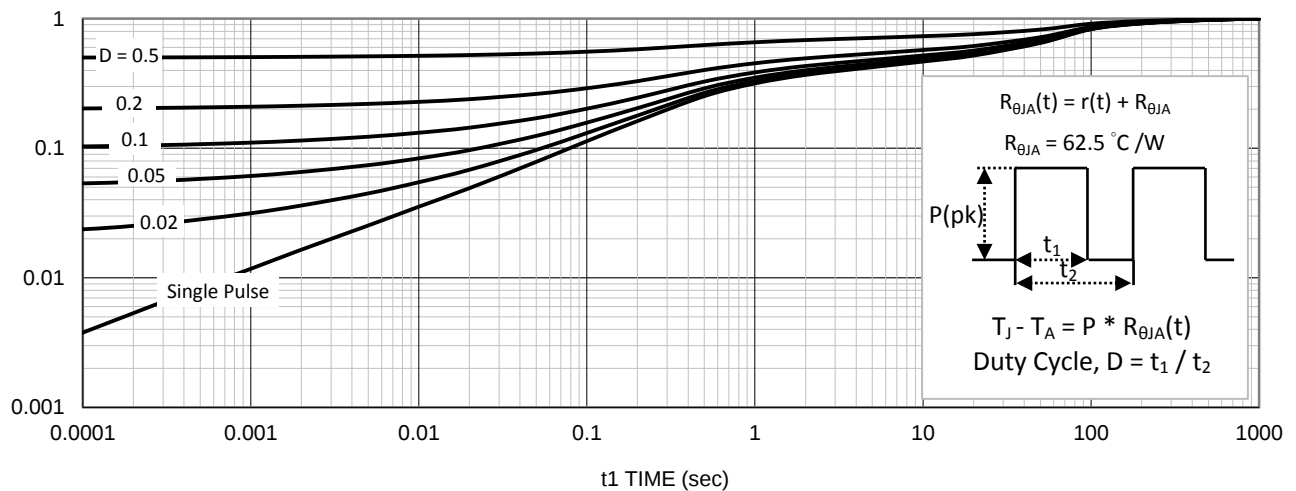
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information

