

## P-Channel 40-V (D-S) MOSFET

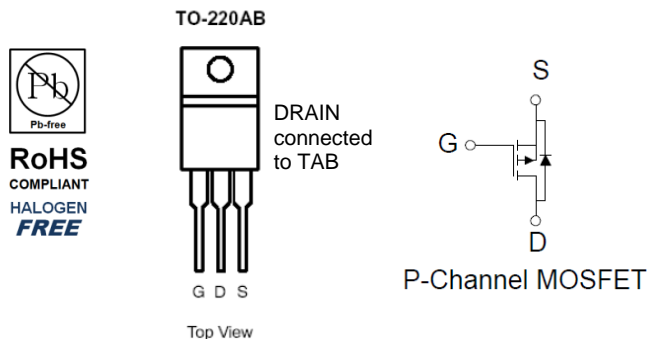
### Key Features:

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

### Typical Applications:

- Power Routing
- High Side Switch
- Motor Drives

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
-40	7.6 @ $V_{GS} = -10V$	-90 <sup>a</sup>
	9 @ $V_{GS} = -4.5V$	



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		$V_{DS}$	-40	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$T_C = 25^\circ\text{C}$	$I_D$	-90	A
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	-390	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$T_C = 25^\circ\text{C}$	$I_S$	-110	A
Power Dissipation	$T_C = 25^\circ\text{C}$	$P_D$	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

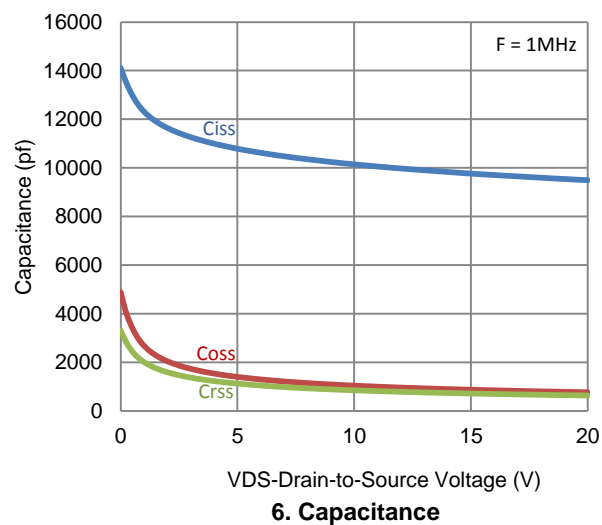
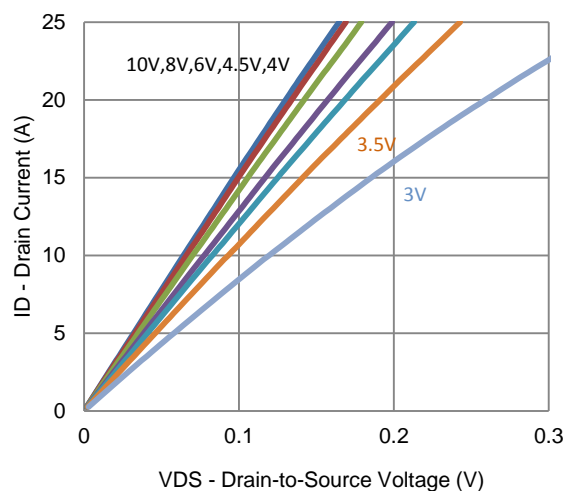
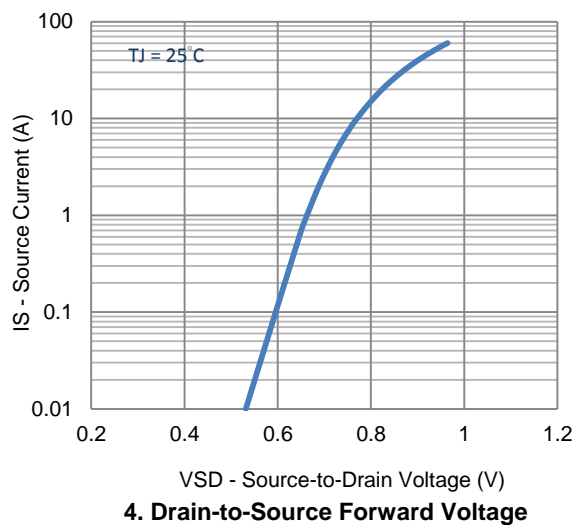
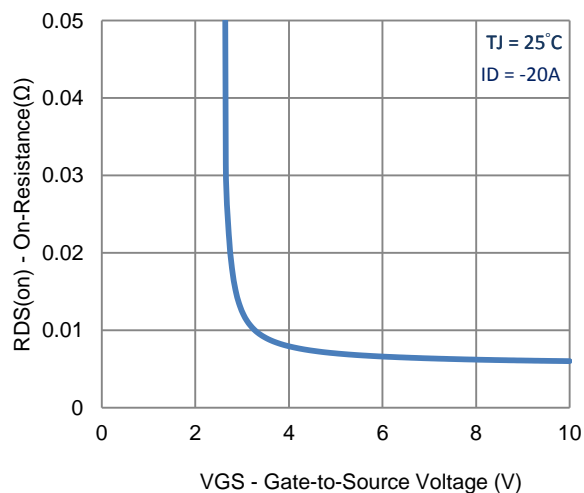
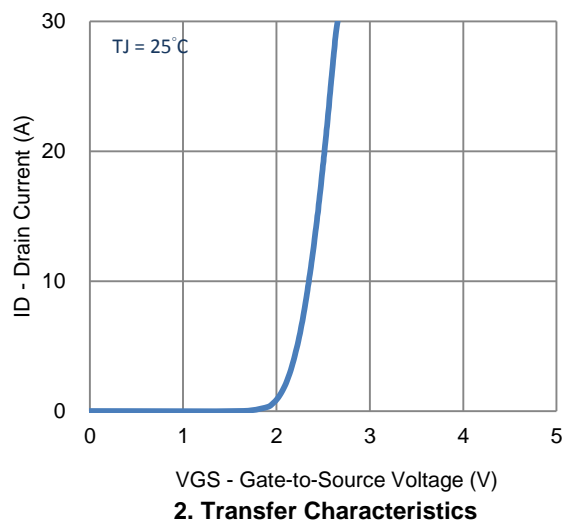
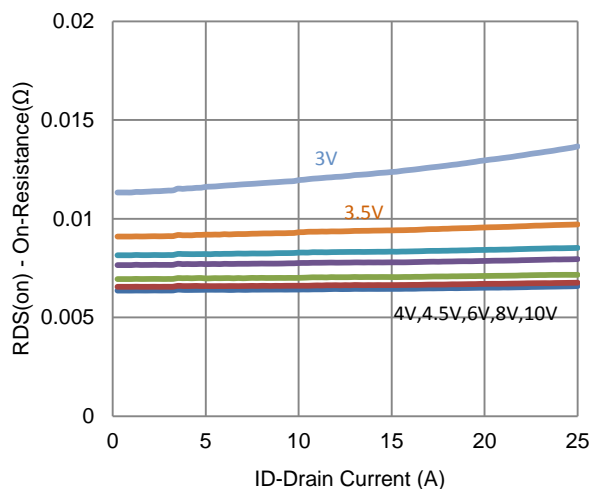
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu A$	-1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -32 V, V_{GS} = 0 V$			-1	$\mu A$
		$V_{DS} = -32 V, V_{GS} = 0 V, T_J = 55^\circ C$			-25	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = -5 V, V_{GS} = -10 V$	-110			A
Drain-Source On-Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -10 V, I_D = -50 A$			7.6	m $\Omega$
		$V_{GS} = -4.5 V, I_D = -44 A$			9	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15 V, I_D = -20 A$		29		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = -55 A, V_{GS} = 0 V$		-0.95		V
<b>Dynamic <sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -20 V, V_{GS} = -4.5 V,$ $I_D = -20 A$		122		nC
Gate-Source Charge	$Q_{gs}$			32		
Gate-Drain Charge	$Q_{gd}$			50		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -20 V, R_L = 1 \Omega,$ $I_D = -20 A,$ $V_{GEN} = -10 V, R_{GEN} = 6 \Omega$		17		ns
Rise Time	$t_r$			28		
Turn-Off Delay Time	$t_{d(off)}$			284		
Fall Time	$t_f$			115		
Input Capacitance	$C_{iss}$	$V_{DS} = -15 V, V_{GS} = 0 V, f = 1 \text{ Mhz}$		9763		pF
Output Capacitance	$C_{oss}$			871		
Reverse Transfer Capacitance	$C_{rss}$			716		

## Notes

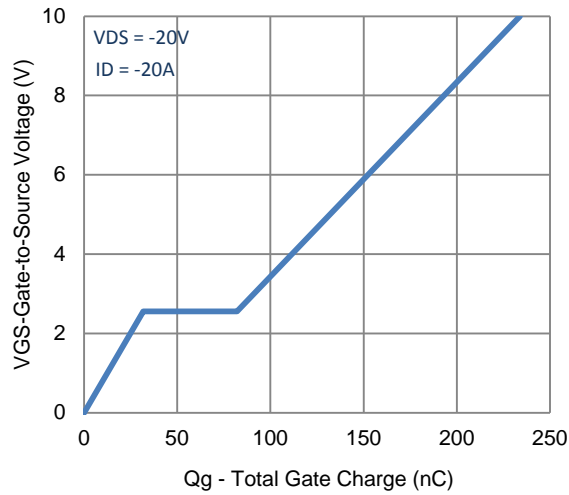
- a. Pulse test: PW ≤ 300us duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

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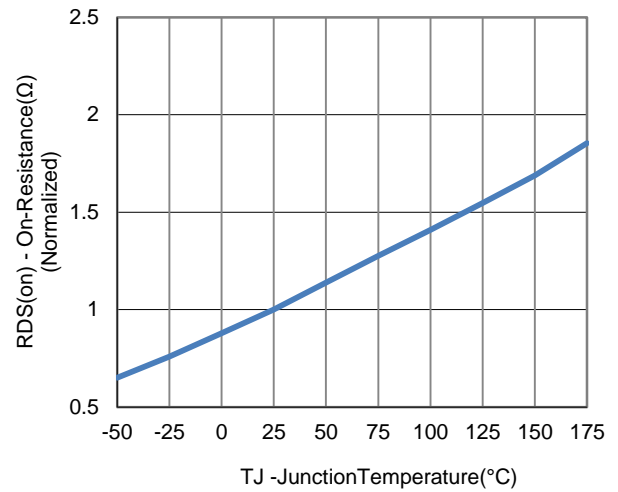
## Typical Electrical Characteristics



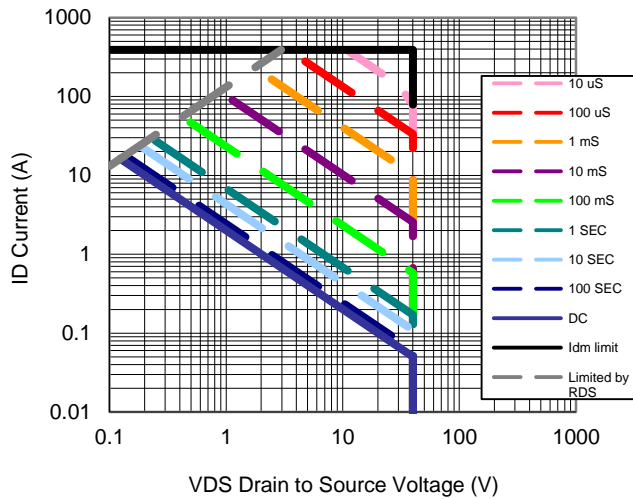
## Typical Electrical Characteristics



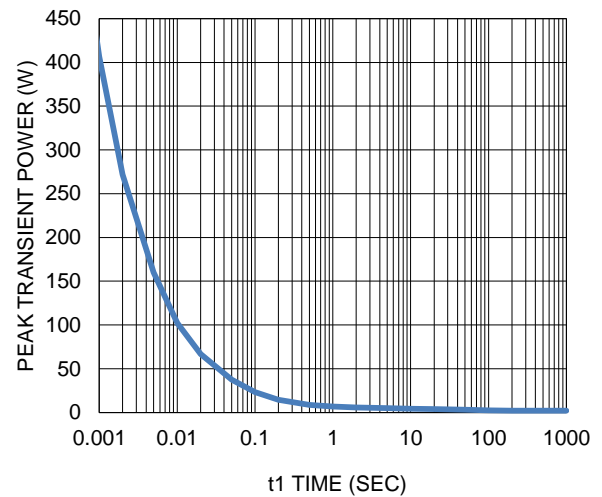
7. Gate Charge



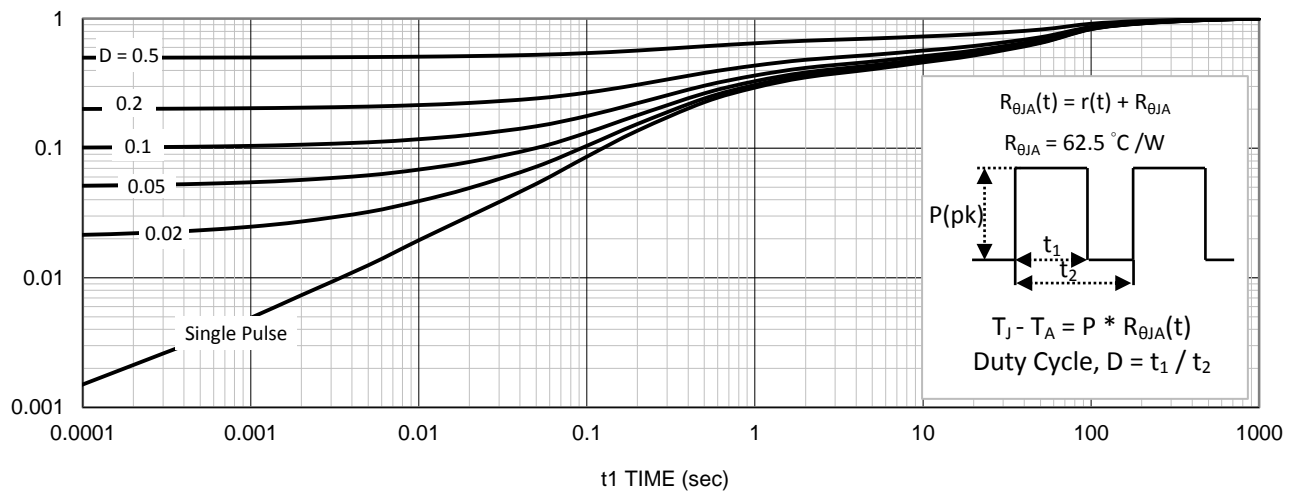
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

## Package Information

