

## N-Channel 60-V (D-S) MOSFET

### Key Features:

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

### Typical Applications:

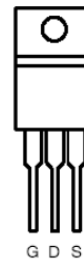
- PoE Power Sourcing Equipment
- PoE Powered Devices
- Telecom DC/DC converters
- White LED boost converters

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
60	9.9 @ $V_{GS} = 10V$	90 <sup>a</sup>
	13 @ $V_{GS} = 4.5V$	

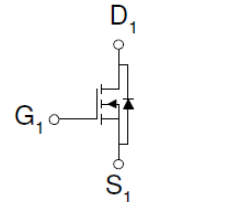


RoHS  
COMPLIANT  
HALOGEN  
FREE

TO-220AB



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		$V_{DS}$	60	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$T_C = 25^\circ C$	$I_D$	90	A
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	240	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	90	A
Power Dissipation <sup>a</sup>	$T_C = 25^\circ C$	$P_D$	120	W
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 175	$^\circ C$

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>a</sup>	$R_{\theta JA}$	62.5	$^\circ C/W$
Maximum Junction-to-Case	$R_{\theta JC}$	1.25	

Notes

- Package limited
- Pulse width limited by maximum junction temperature

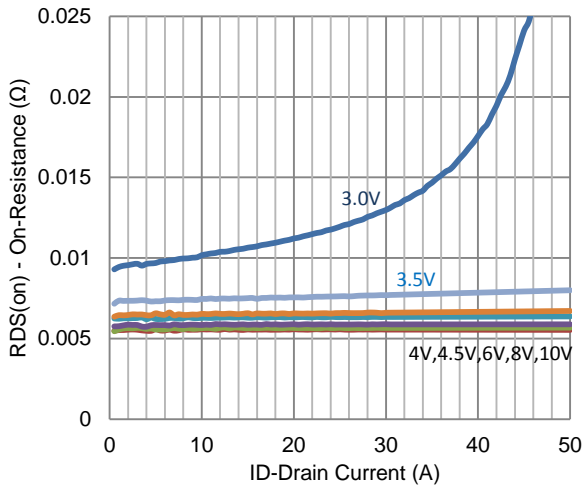
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1		3.5	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 48 V, V_{GS} = 0 V$			1	uA
		$V_{DS} = 48 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 10 V$	120			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 V, I_D = 30 A$			9.9	m $\Omega$
		$V_{GS} = 4.5 V, I_D = 20 A$			13	
Forward Transconductance	$g_{fs}$	$V_{DS} = 15 V, I_D = 20 A$		30		S
Diode Forward Voltage	$V_{SD}$	$I_S = 20 A, V_{GS} = 0 V$		0.8		V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 30 V, V_{GS} = 4.5 V, I_D = 20 A$		77		nC
Gate-Source Charge	$Q_{gs}$			21		
Gate-Drain Charge	$Q_{gd}$			40		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 30 V, R_L = 1.5 \Omega, I_D = 20 A,$ $V_{GEN} = 10 V, R_{GEN} = 6 \Omega$		23		ns
Rise Time	$t_r$			80		
Turn-Off Delay Time	$t_{d(off)}$			226		
Fall-Time	$t_f$			99		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		5887		pF
Output Capacitance	$C_{oss}$			567		
Reverse Transfer Capacitance	$C_{rss}$			352		

## Notes

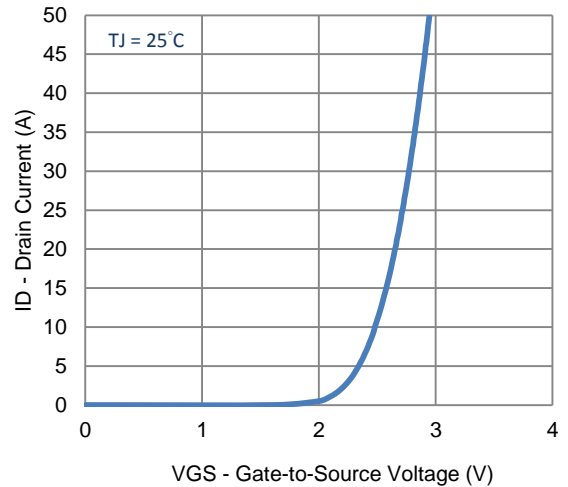
- Pulse test:  $PW \leq 300 \mu s$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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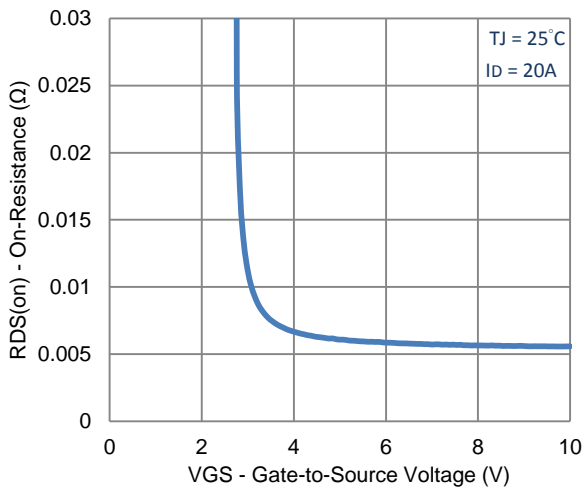
Typical Electrical Characteristics



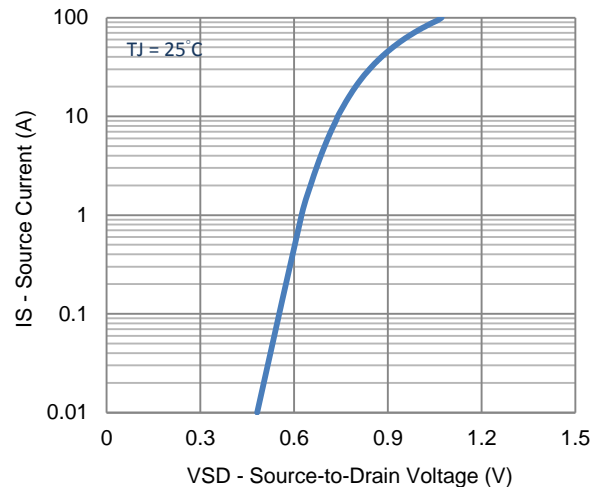
1. On-Resistance vs. Drain Current



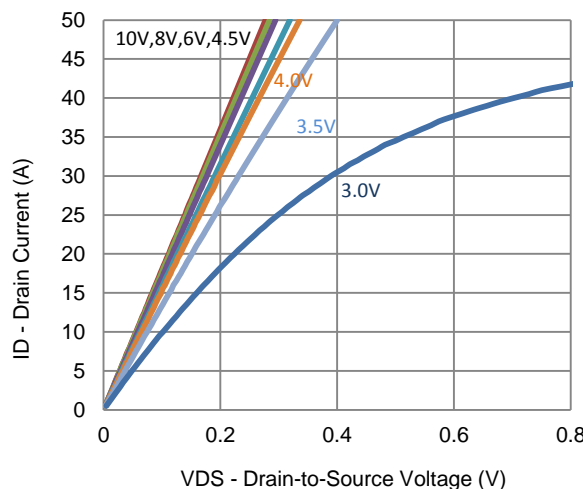
2. Transfer Characteristics



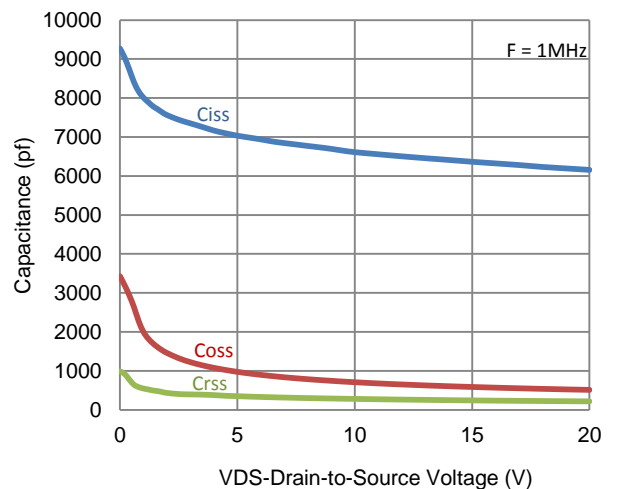
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

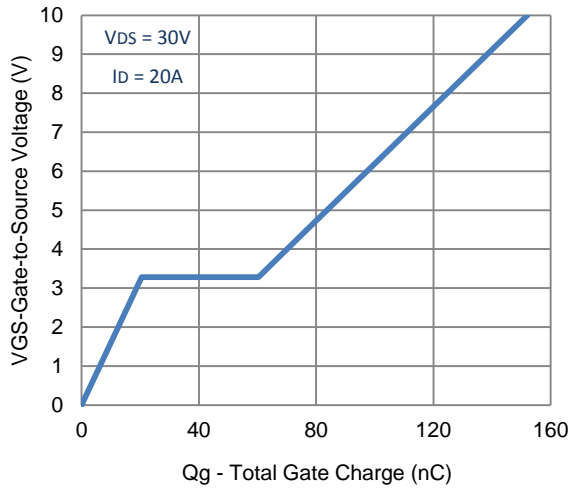


5. Output Characteristics

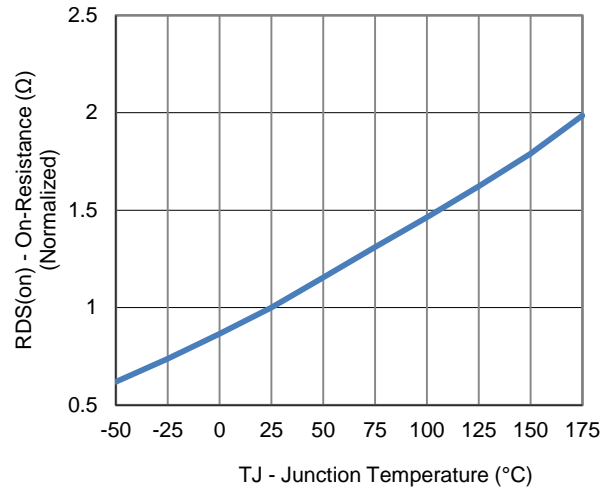


6. Capacitance

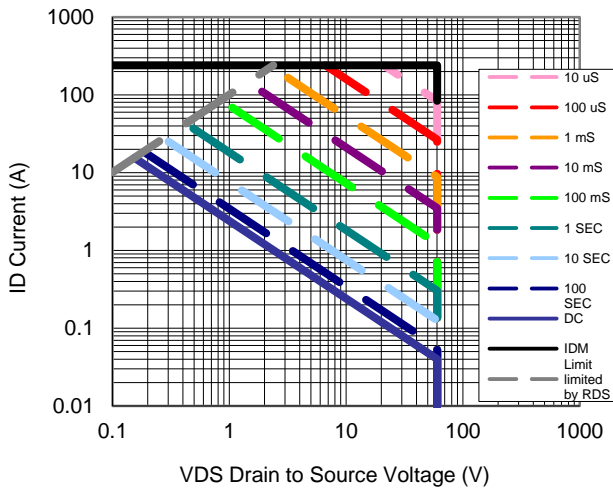
Typical Electrical Characteristics



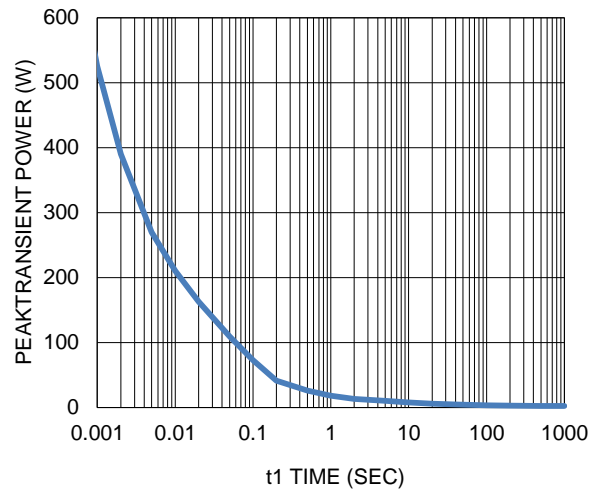
7. Gate Charge



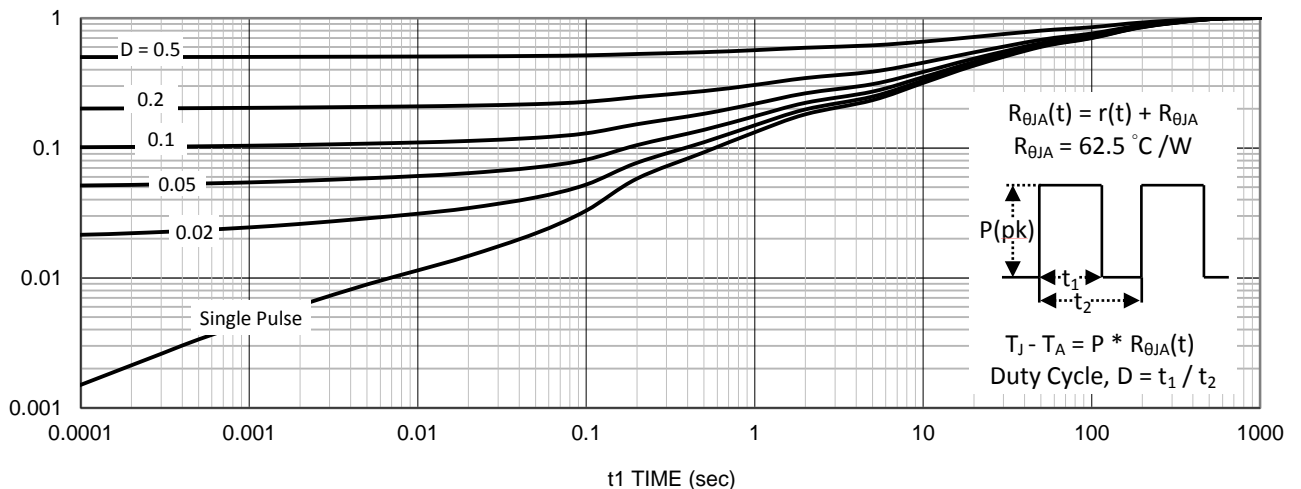
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information

