

## N-Channel 80-V (D-S) MOSFET

### Key Features:

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

### Typical Applications:

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
80	11 @ $V_{GS} = 10V$	90 <sup>a</sup>
	13 @ $V_{GS} = 4.5V$	



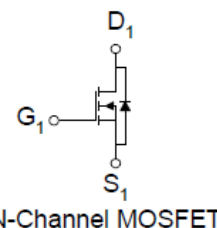
**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

TO-220AB



G D S

Top View



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Units
Drain-Source Voltage	$V_{DS}$	80	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$I_D$	90a	A
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	350	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	120	
Power Dissipation <sup>a</sup>	$P_D$	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 <sup>a</sup>	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
		0.5	

### Notes

- Package Limited
- Pulse width limited by maximum junction temperature

## Electrical Characteristics

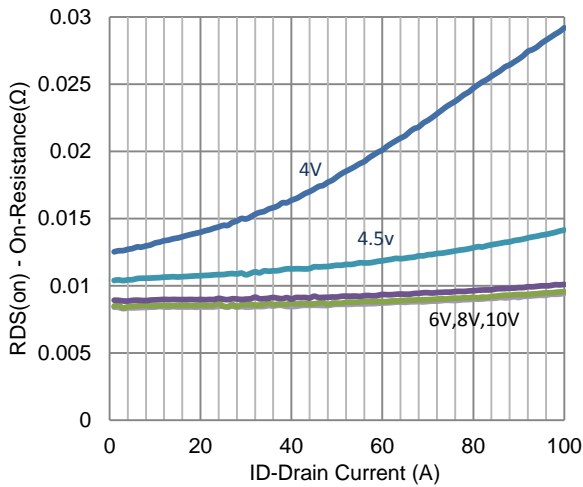
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 64 V, V_{GS} = 0 V$			1	uA
		$V_{DS} = 64 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 10 V$	45			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 V, I_D = 45 A$			11	m $\Omega$
		$V_{GS} = 4.5 V, I_D = 44 A$			13	
Forward Transconductance	$g_{fs}$	$V_{DS} = 15 V, I_D = 45 A$		40		S
Diode Forward Voltage	$V_{SD}$	$I_S = 60 A, V_{GS} = 0 V$		0.9		V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 40 V, V_{GS} = 4.5 V, I_D = 20 A$		58		nC
Gate-Source Charge	$Q_{gs}$			14		
Gate-Drain Charge	$Q_{gd}$			39		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 40 V, R_L = 2 \Omega, I_D = 20 A,$ $V_{GEN} = 10 V, R_{GEN} = 6 \Omega$		19		ns
Rise Time	$t_r$			45		
Turn-Off Delay Time	$t_{d(off)}$			178		
Fall Time	$t_f$			62		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		4021		pF
Output Capacitance	$C_{oss}$			449		
Reverse Transfer Capacitance	$C_{rss}$			440		

## Notes

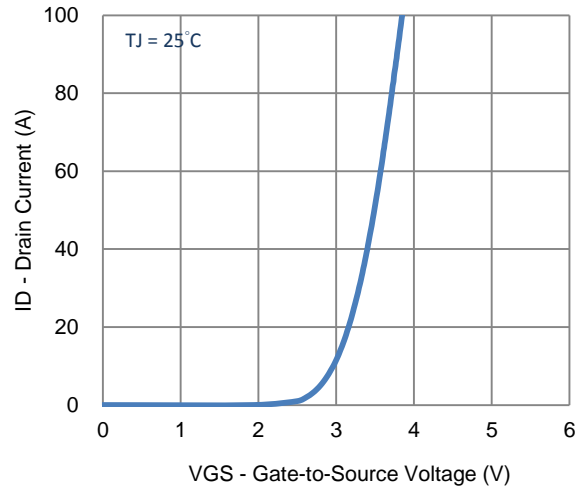
- Pulse test: PW  $\leq$  300us duty cycle  $\leq$  2%.
- Guaranteed by design, not subject to production testing.

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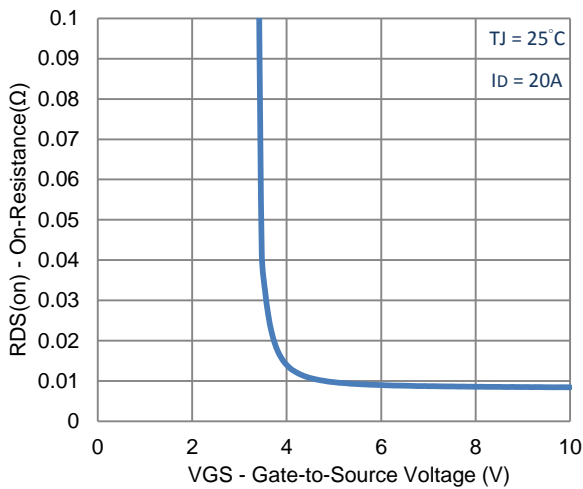
Typical Electrical Characteristics



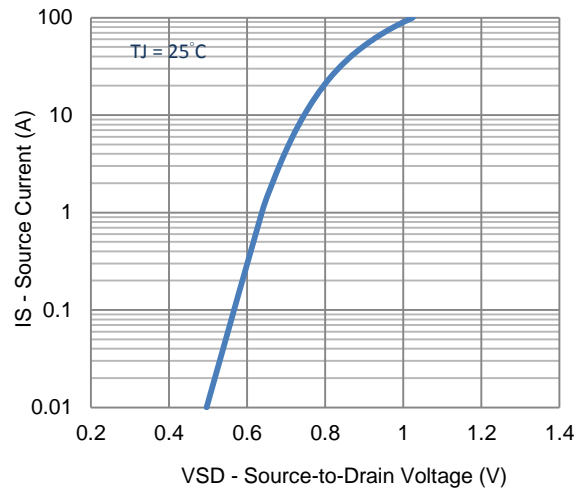
1. On-Resistance vs. Drain Current



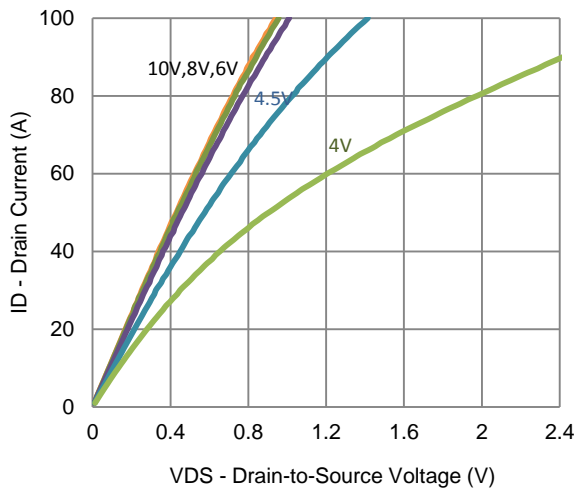
2. Transfer Characteristics



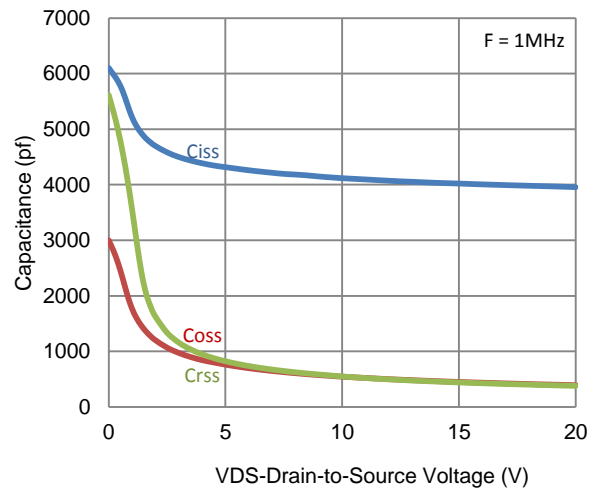
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

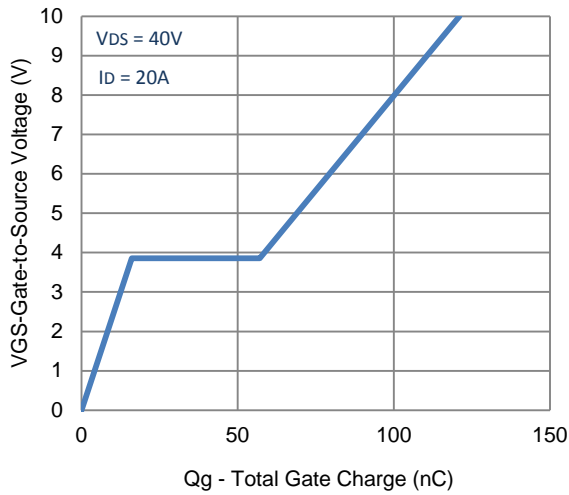


5. Output Characteristics

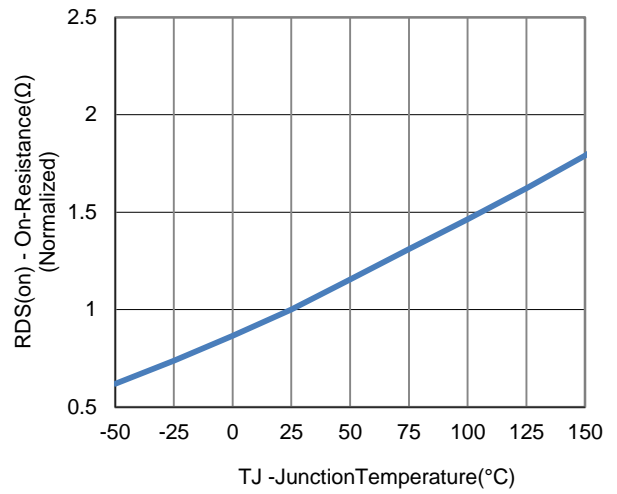


6. Capacitance

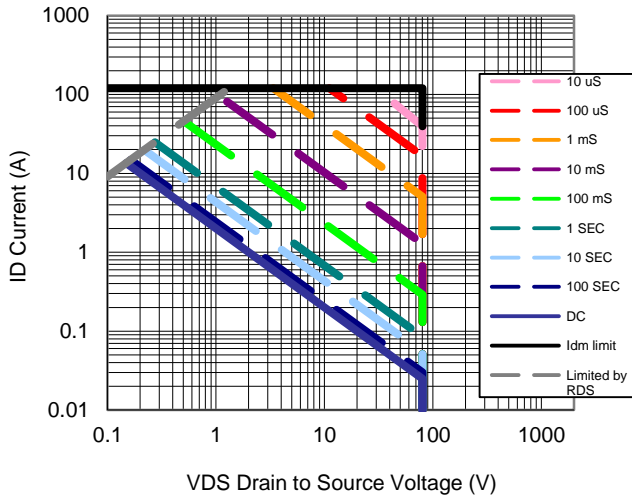
Typical Electrical Characteristics



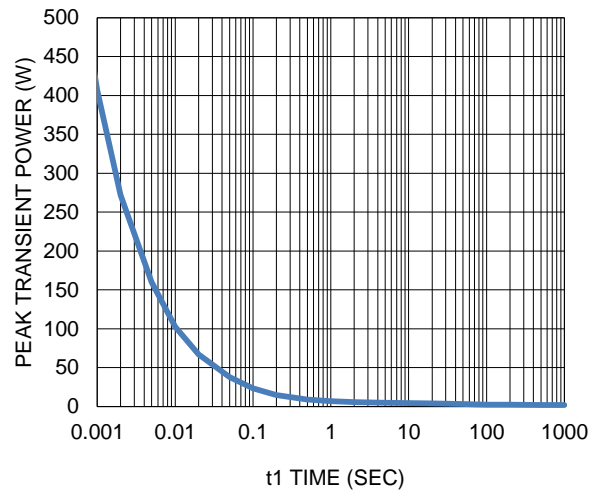
7. Gate Charge



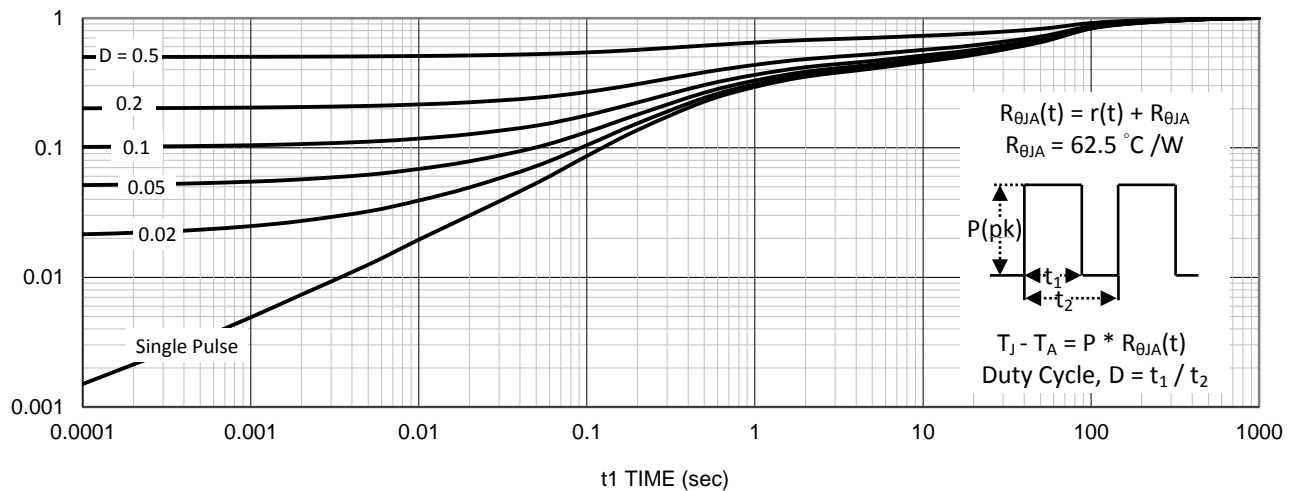
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

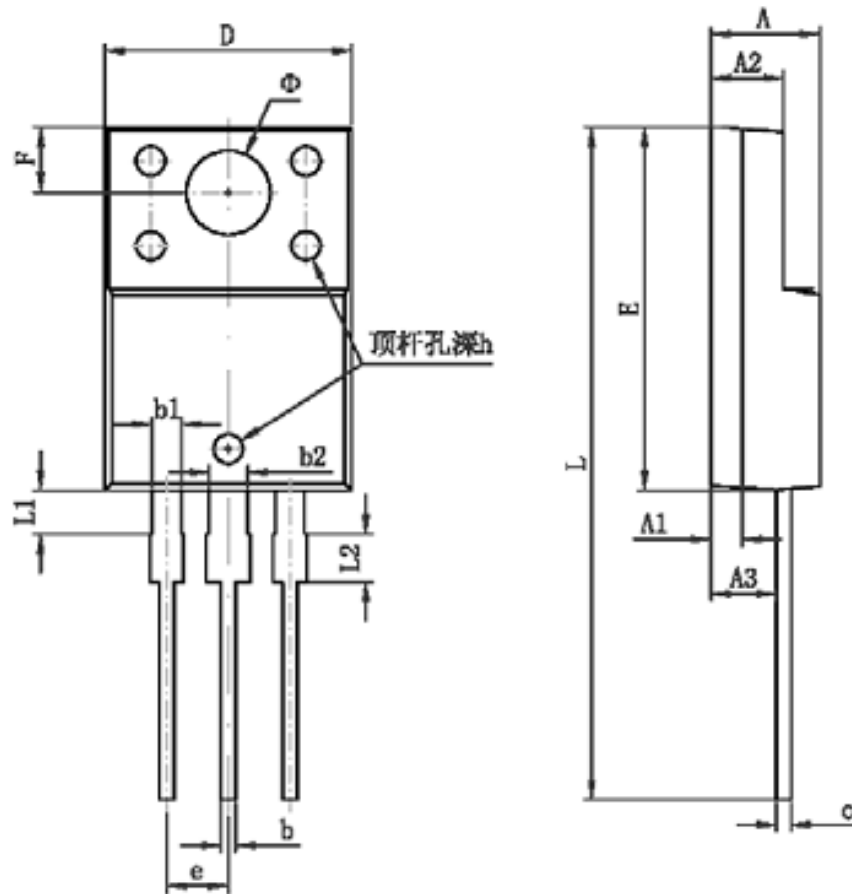


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.300	4.700	0.169	0.185
A1	1.300 REF		0.051 REF	
A2	2.800	3.200	0.110	0.126
A3	2.500	2.900	0.098	0.114
b	0.500	0.750	0.020	0.030
b1	1.100	1.350	0.043	0.053
b2	1.500	1.750	0.059	0.069
c	0.500	0.750	0.020	0.030
D	9.960	10.360	0.392	0.408
E	14.800	15.200	0.583	0.598
e	2.540 TYP		0.100 TYP	
F	2.700 REF		0.106 REF	
$\phi$	3.500 REF		0.138 REF	
h	0.000	0.300	0.000	0.012
L	28.000	28.400	1.102	1.118
L1	1.700	1.900	0.067	0.075
L2	1.900	2.100	0.075	0.083