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

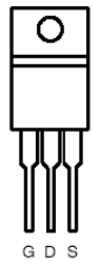
Key Features:
- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed

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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (mΩ)	I_D(A)
80	5.5 @ V_{GS} = 10V	90[a]
	6.5 @ V_{GS} = 4.5V	

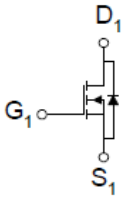
Pb-free
RoHS COMPLIANT
HALOGEN FREE

TO-220AB



G D S

Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		**Symbol**	**Limit**	**Units**
Drain-Source Voltage		V_{DS}	80	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current [a]	T_A=25°C	I_D	90[a]	A
Pulsed Drain Current [b]		I_{DM}	350	
Continuous Source Current (Diode Conduction) [a]		I_S	120	
Power Dissipation [a]	T_A=25°C	P_D	300	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS				
Parameter		**Symbol**	**Maximum**	**Units**
Maximum Junction-to-Ambient [a]	t <= 10 sec	$R_{\theta JA}$	62.5	°C/W
	Steady State		0.5	

Notes

a. Package Limited

b. Pulse width limited by maximum junction temperature

Electrical Characteristics

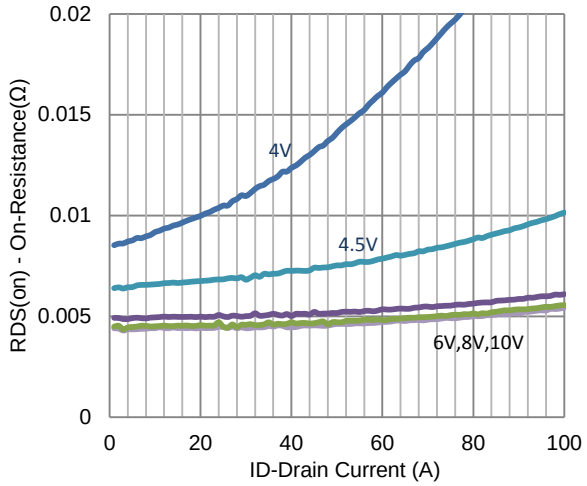
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 uA	1			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 64 V, V_{GS} = 0 V			1	uA
		V_{DS} = 64 V, V_{GS} = 0 V, T_J = 55°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			5.5	mΩ
		V_{GS} = 4.5 V, I_D = 44 A			6.5	
Forward Transconductance	g_{fs}	V_{DS} = 15 V, I_D = 45 A		22		S
Diode Forward Voltage	V_{SD}	I_S = 60 A, V_{GS} = 0 V		0.9		V
Dynamic						
Total Gate Charge	Q_g	V_{DS} = 40 V, V_{GS} = 4.5 V, I_D = 20 A		112		nC
Gate-Source Charge	Q_{gs}			23		
Gate-Drain Charge	Q_{gd}			76		
Turn-On Delay Time	$t_{d(on)}$	V_{DS} = 40 V, R_L = 2 Ω, I_D = 20 A, V_{GEN} = 10 V, R_{GEN} = 6 Ω		25		ns
Rise Time	t_r			56		
Turn-Off Delay Time	$t_{d(off)}$			360		
Fall Time	t_f			122		
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz		10609		pF
Output Capacitance	C_{oss}			989		
Reverse Transfer Capacitance	C_{rss}			936		

Notes

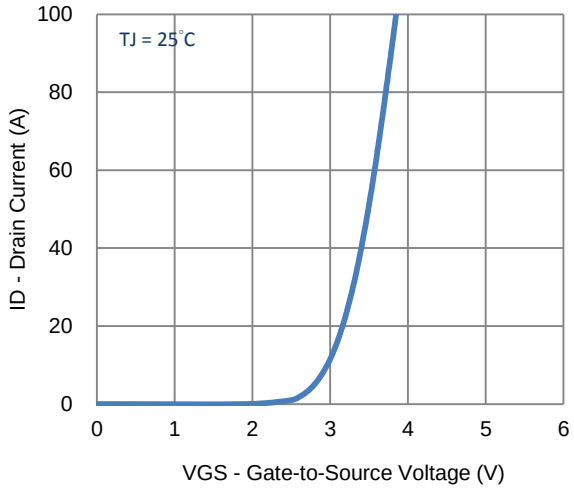
a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

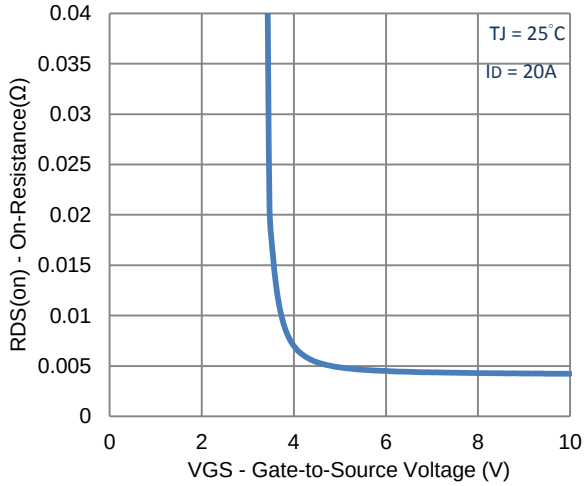
Typical Electrical Characteristics



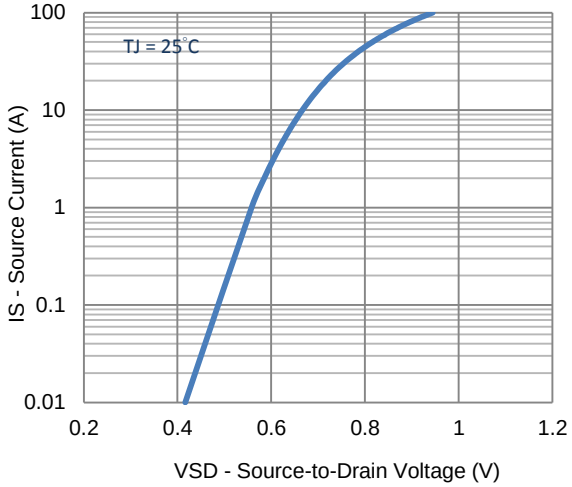
1. On-Resistance vs. Drain Current



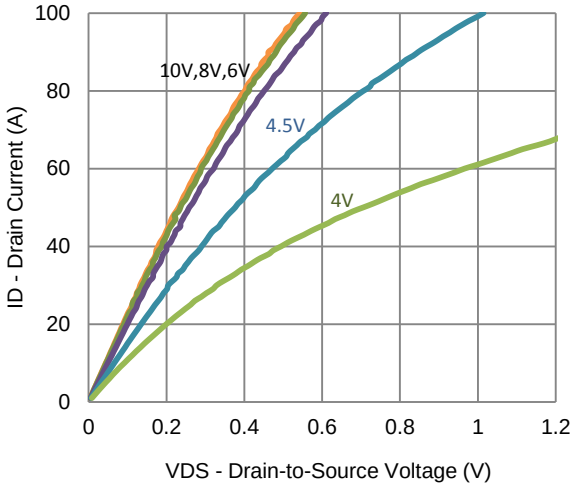
2. Transfer Characteristics



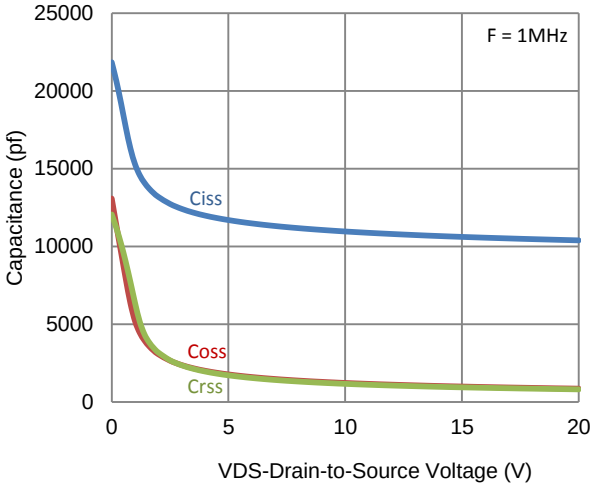
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

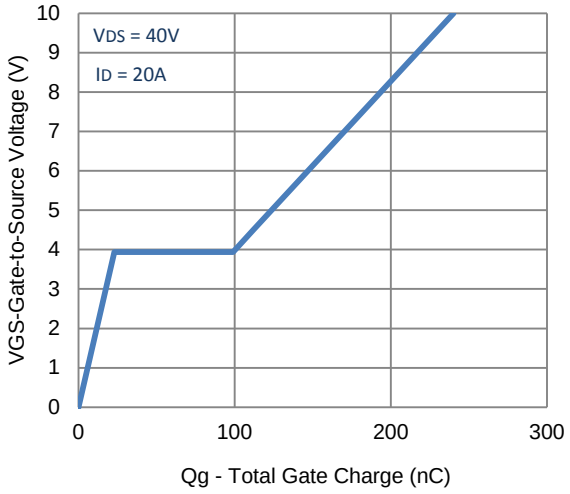


5. Output Characteristics

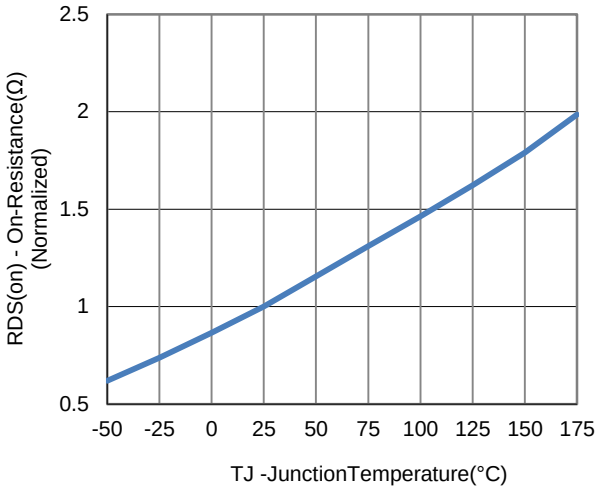


6. Capacitance

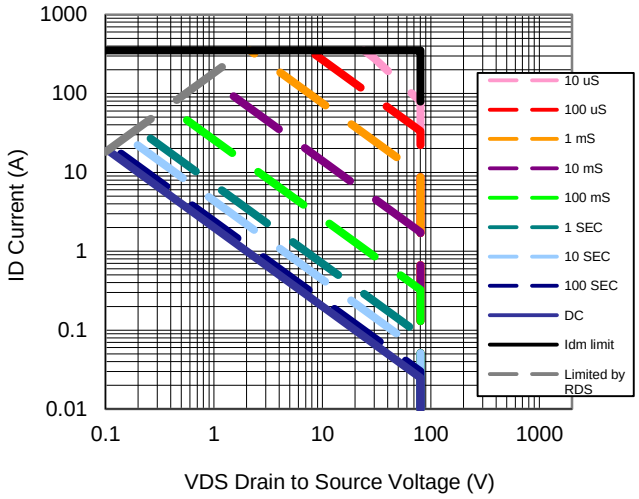
Typical Electrical Characteristics



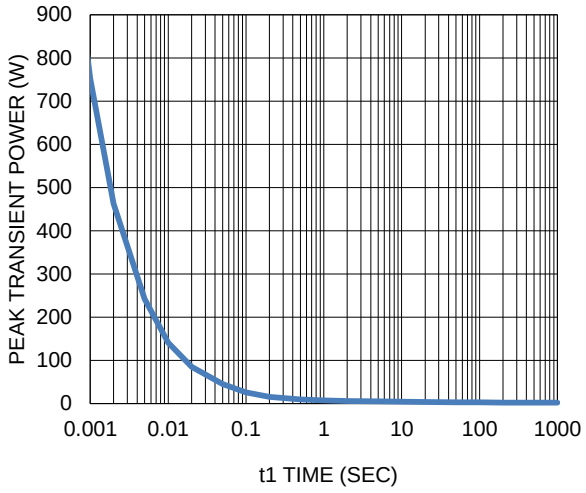
7. Gate Charge



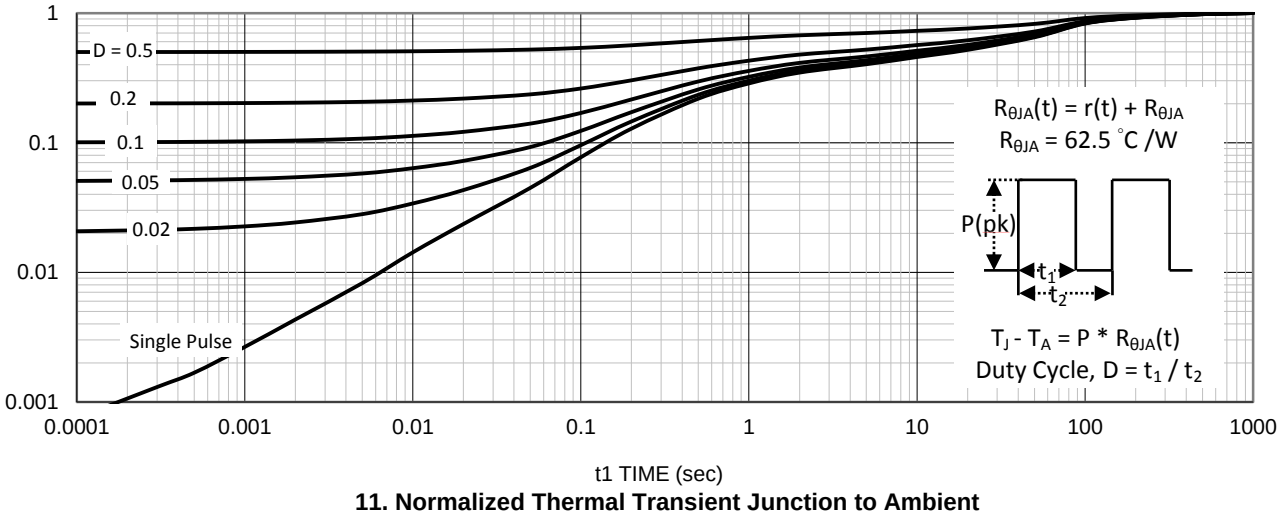
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

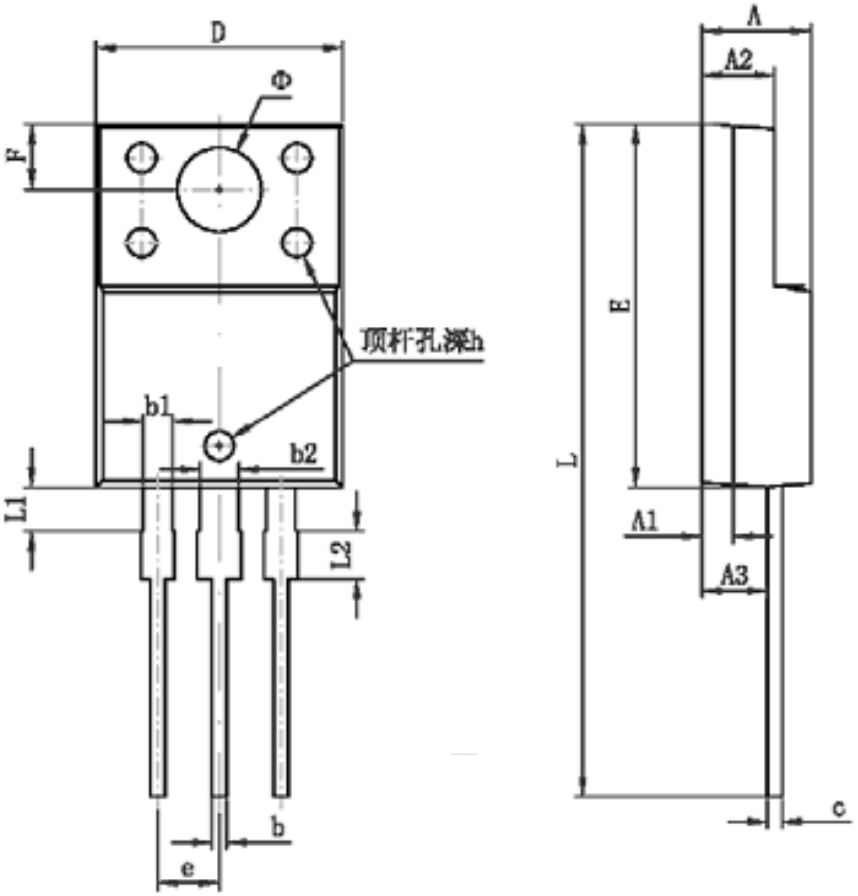


10. Single Pulse Maximum Power Dissipation



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	
Φ	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