

## N-Channel 120-V (D-S) MOSFET

### Key Features:

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

### Typical Applications:

- LED Inverter Circuits
- DC/DC Conversion Circuits
- Motor drives

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
120	10 @ $V_{GS} = 10V$	63
	14 @ $V_{GS} = 6.5V$	53

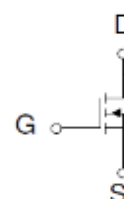


**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

TO-220CFM



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		$V_{DS}$	120	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$T_C = 25^\circ\text{C}$	$I_D$	63	A
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	250	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$T_C = 25^\circ\text{C}$	$I_S$	63	A
Power Dissipation <sup>a</sup>	$T_C = 25^\circ\text{C}$	$P_D$	60	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>c</sup>	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Maximum Junction-to-Case	$R_{\theta JC}$	2.5	

### Notes

- Package Limited
- Pulse width limited by maximum junction temperature
- Surface Mounted on 1" x 1" FR4 Board.

## Electrical Characteristics

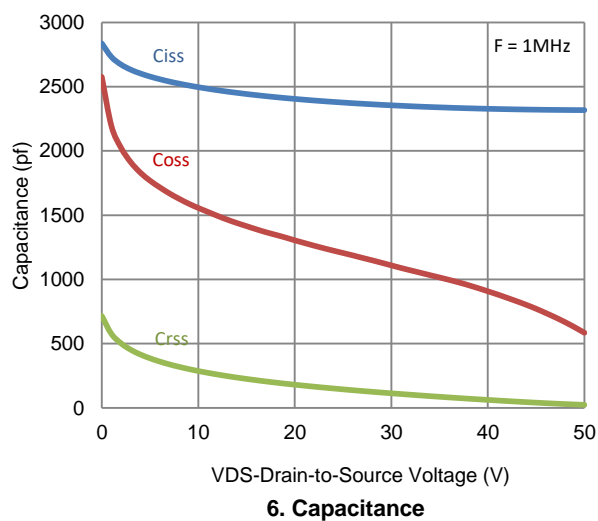
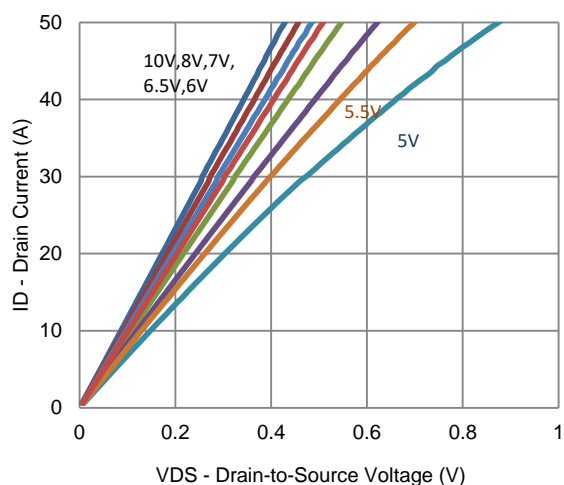
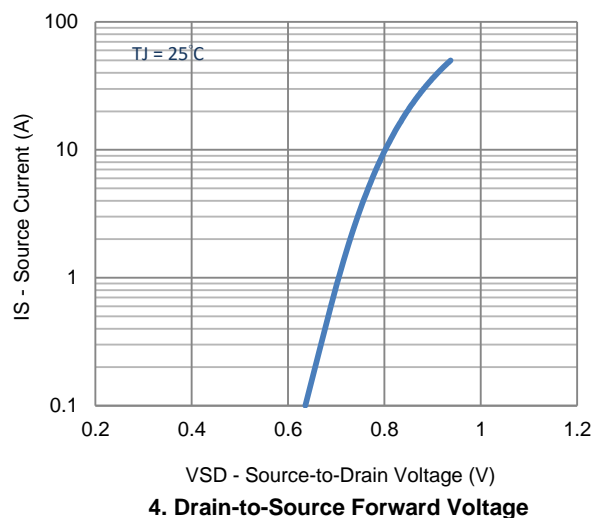
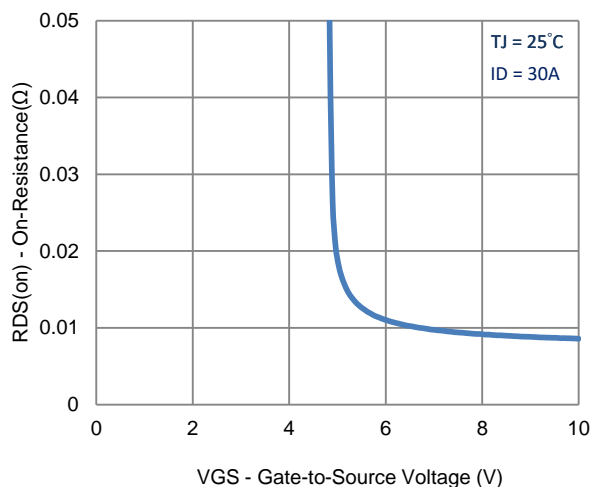
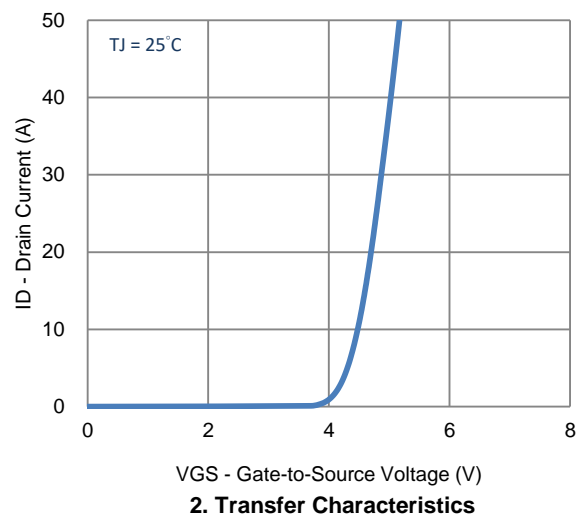
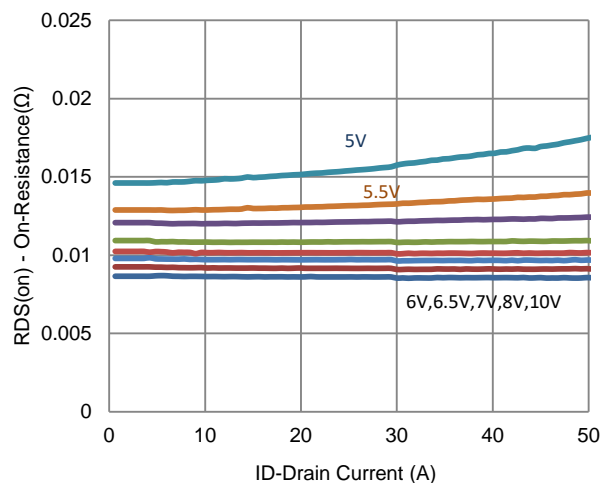
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250 \mu A$	1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V$ , $V_{GS} = \pm 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 96 V$ , $V_{GS} = 0 V$			1	$\mu A$
		$V_{DS} = 96 V$ , $V_{GS} = 0 V$ , $T_J = 55^\circ C$			10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = 5 V$ , $V_{GS} = 10 V$	90			A
Drain-Source On-Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = 10 V$ , $I_D = 30 A$			10	m $\Omega$
		$V_{GS} = 6.5 V$ , $I_D = 25 A$			14	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 15 V$ , $I_D = 30 A$		58		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = 30 A$ , $V_{GS} = 0 V$		0.88		V
<b>Dynamic <sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 60 V$ , $V_{GS} = 6.5 V$ , $I_D = 30 A$		30		nC
Gate-Source Charge	$Q_{gs}$			12		
Gate-Drain Charge	$Q_{gd}$			12		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 60 V$ , $R_L = 2 \Omega$ , $I_D = 30 A$ , $V_{GEN} = 10 V$ , $R_{GEN} = 6 \Omega$		17		ns
Rise Time	$t_r$			16		
Turn-Off Delay Time	$t_{d(off)}$			47		
Fall Time	$t_f$			68		
Input Capacitance	$C_{iss}$	$V_{DS} = 50 V$ , $V_{GS} = 0 V$ , $f = 1 Mhz$		2318		pF
Output Capacitance	$C_{oss}$			585		
Reverse Transfer Capacitance	$C_{rss}$			24		

## Notes

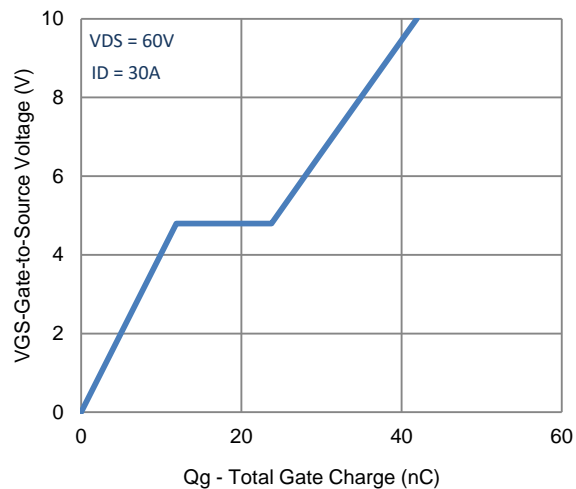
- Pulse test: PW  $\leq$  300us duty cycle  $\leq$  2%.
- Guaranteed by design, not subject to production testing.

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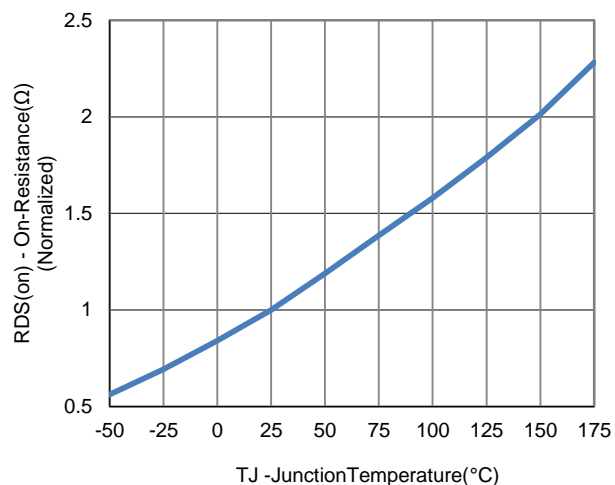
## Typical Electrical Characteristics



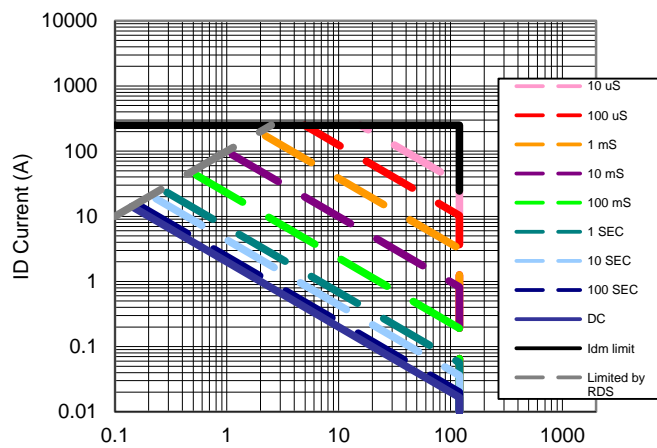
## Typical Electrical Characteristics



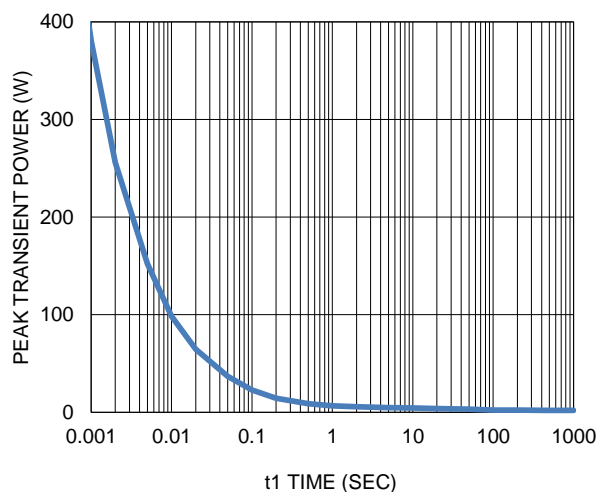
7. Gate Charge



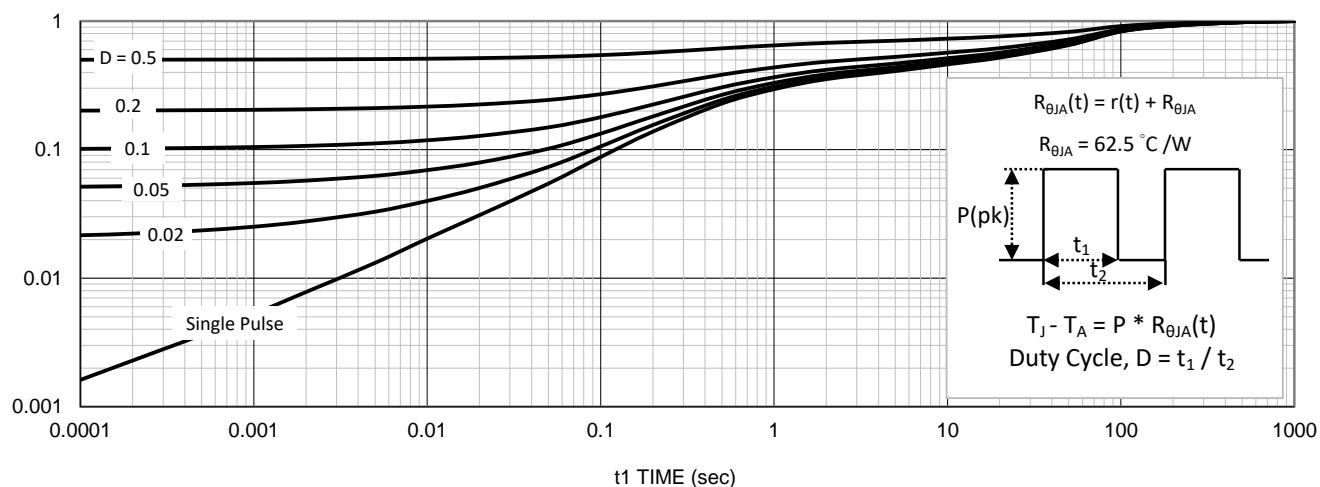
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

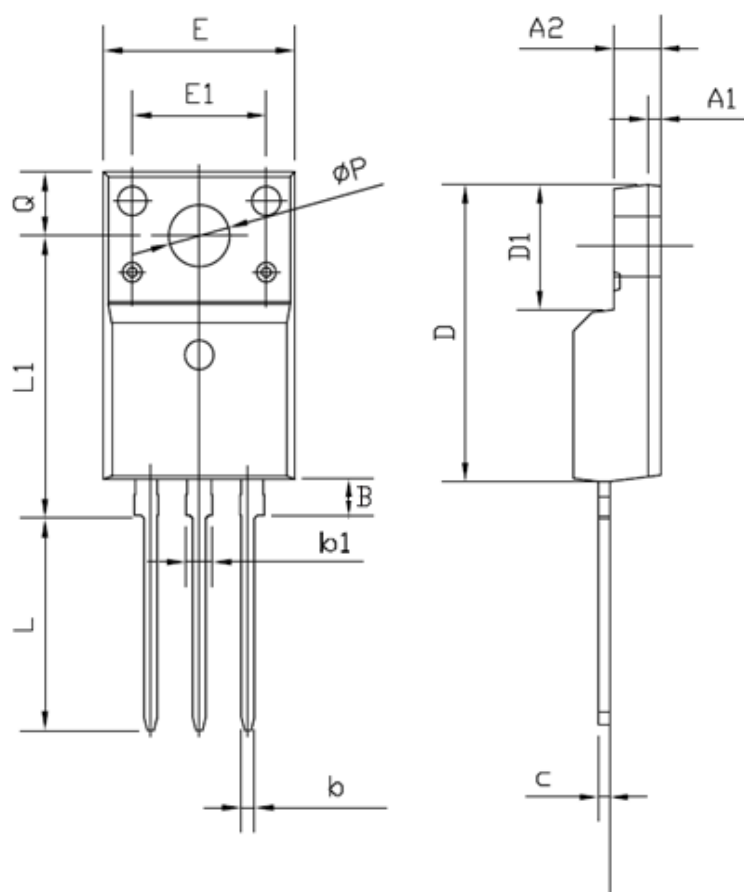


10. Single Pulse Maximum Power Dissipation

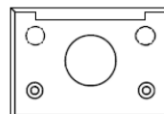
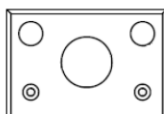
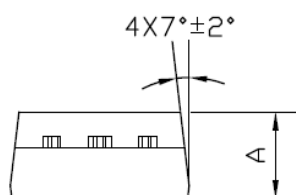


11. Normalized Thermal Transient Junction to Ambient

## Package Information



DIM.	MILLIMETERS	
	MIN	MAX
A	4.24	4.72
A1	1.11	1.41
A2	2.22	2.7
B	2.6	3.9
b	0.66	0.94
b2	1.17	1.45
c	0.4	0.6
D	14.5	15.74
D1	8.4	9.65
D2	12.08	12.48
E	9.7	10.54
E1	8	8.4
e	2.49	2.59
L	12.27	14.5
ØP	3.55	3.89
Q	2.58	2.98



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