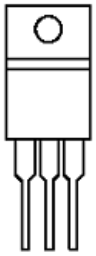
N-Channel 200-V (D-S) MOSFET

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)	$r_{DS(on)}$ (mΩ)	I_D(A)
200	400 @ V_{GS} = 10V	9
	450 @ V_{GS} = 5.5V	8.5

TO-220CFM



G D S

Top View

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		**Symbol**	**Limit**	**Units**
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_C=25°C	I_D	9	A
Pulsed Drain Current [a]		I_{DM}	50	
Continuous Source Current (Diode Conduction)		I_S	50	A
Power Dissipation	T_C=25°C	P_D	60	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	$R_{\theta JA}$	62.5	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	2.5	

Notes

a. Pulse width limited by maximum junction temperature

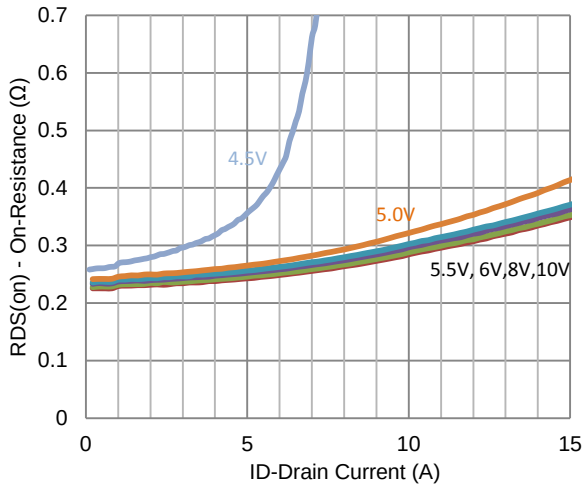
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, ID = 250 uA	1		3.5	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = 20 V			±10	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 160 V, V_{GS} = 0 V			1	uA
		V_{DS} = 160 V, V_{GS} = 0 V, T_J = 55°C			25	
On-State Drain Current	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	34			A
Drain-Source On-Resistance	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 9 A			400	mΩ
		V_{GS} = 5.5 V, I_D = 8.5 A			450	
Forward Transconductance	g_{fs}	V_{DS} = 15 V, I_D = 10 A		20		S
Diode Forward Voltage	V_{SD}	I_S = 25 A, V_{GS} = 0 V		0.95		V
Dynamic						
Total Gate Charge	Q_g	V_{DS} = 100 V, V_{GS} = 10 V, I_D = 6 A		15.8		nC
Gate-Source Charge	Q_{gs}			4.2		
Gate-Drain Charge	Q_{gd}			4.4		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 100 V, R_L = 10 Ω , I_D = 6 A, V_{GEN} = 10 V, R_{GEN} = 6 Ω		10.8		nS
Rise Time	t_r			17.6		
Turn-Off Delay Time	$t_{d(off)}$			32.2		
Fall-Time	t_f			30.2		
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f =1MHz		807		pF
Output Capacitance	C_{oss}			81		
Reverse Transfer Capacitance	C_{rss}			38		

Notes

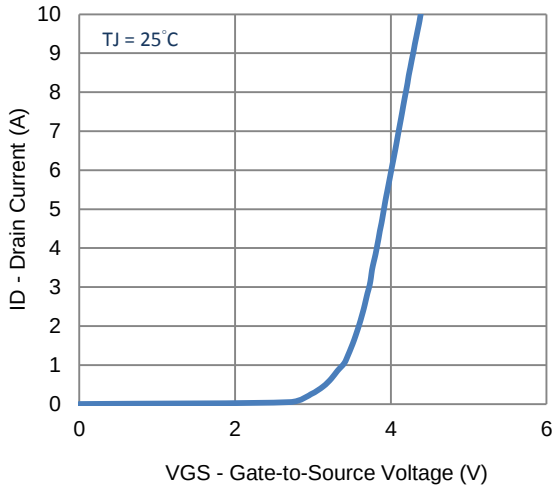
a. Pulse test: PW <= 300us duty cycle <= 2%.

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

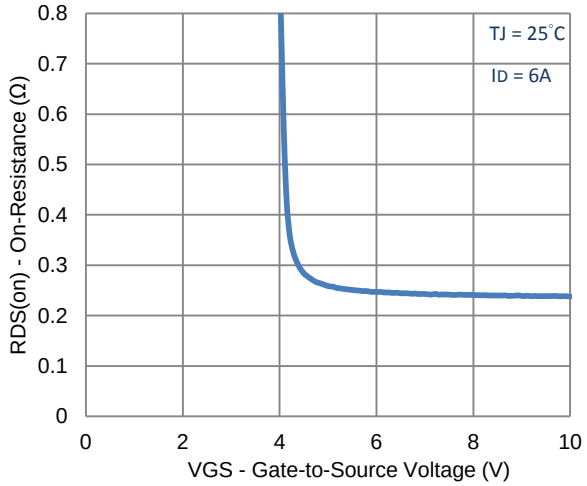
Typical Electrical Characteristics



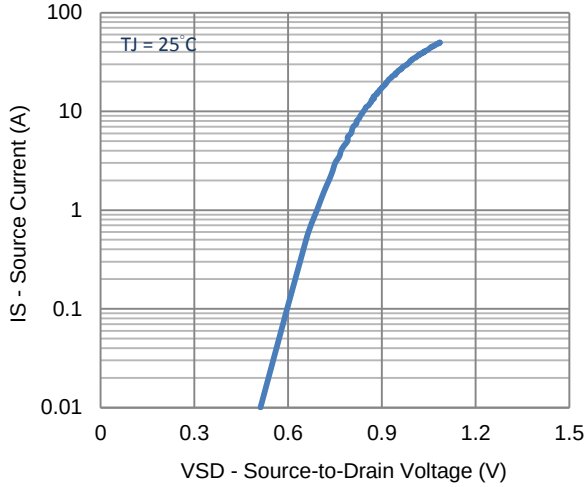
1. On-Resistance vs. Drain Current



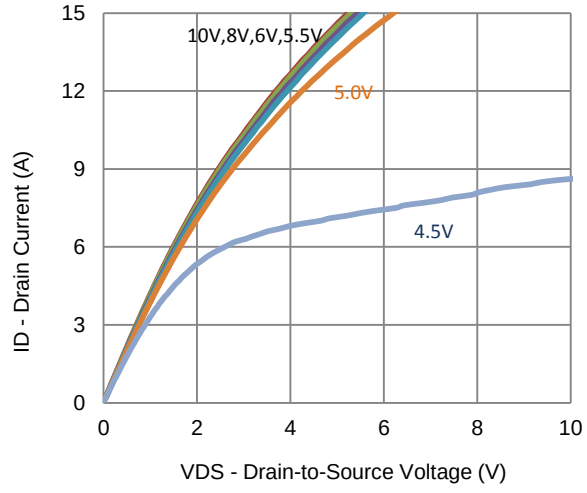
2. Transfer Characteristics



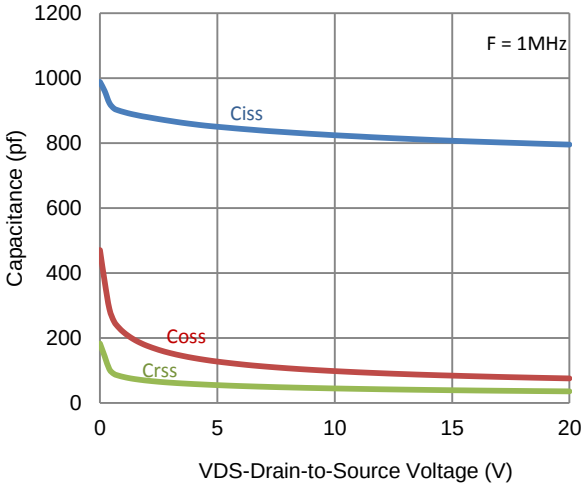
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

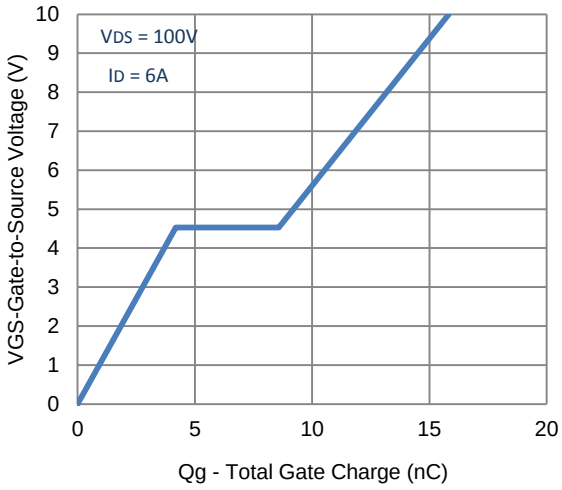


5. Output Characteristics

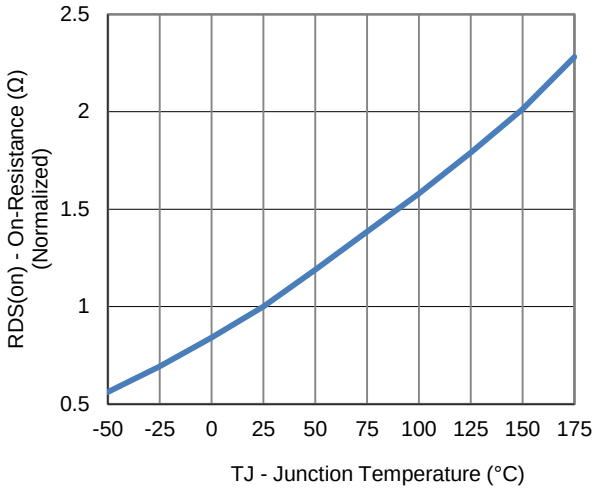


6. Capacitance

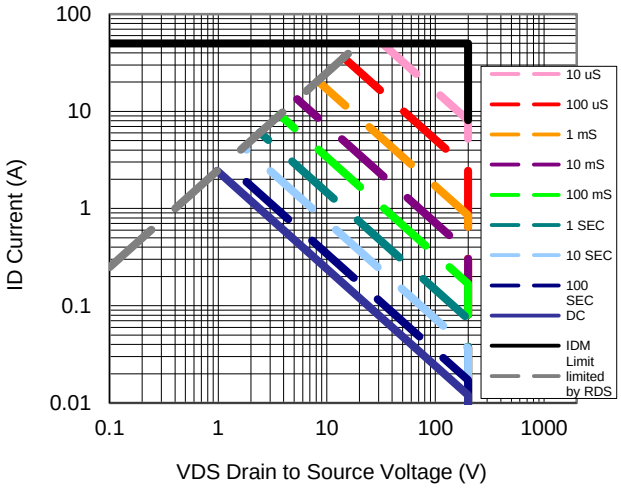
Typical Electrical Characteristics



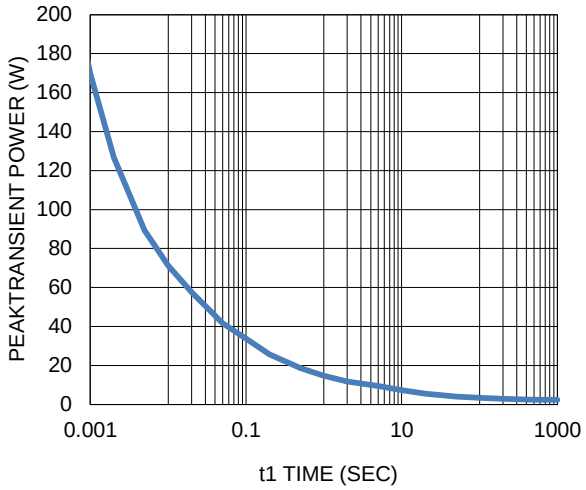
7. Gate Charge



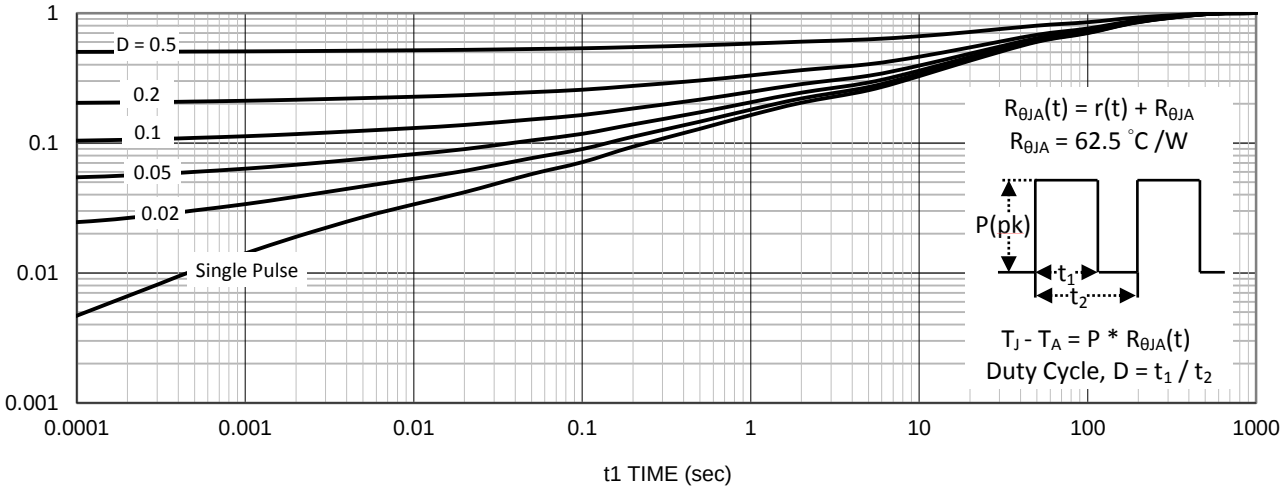
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

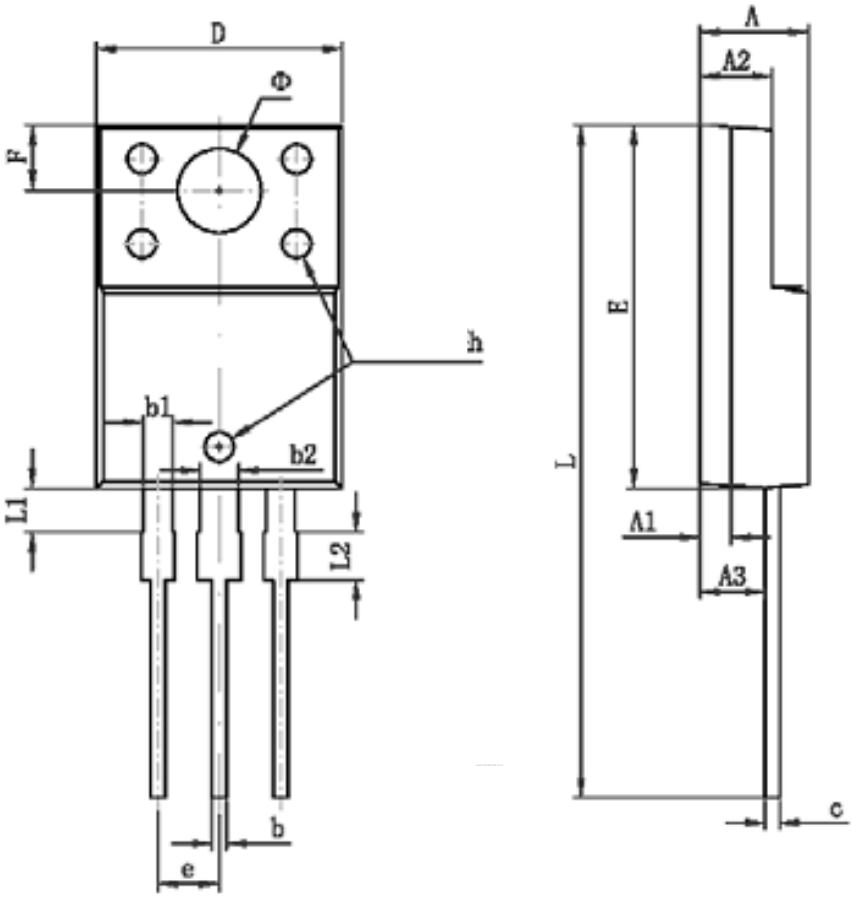


10. Single Pulse Maximum Power Dissipation



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