Description

The CM70R600P/F is the N-Channel enhancement mode power field effect transistors with high cell density, high voltage Super Junction technology. This high density process and design have been optimized switching performance and especially tailored to minimize on-state resistance, .

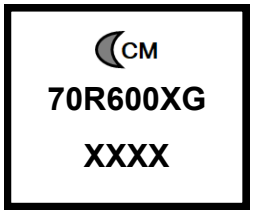
Applications

- AC/DC load switch
- SMPS
- LED power

Features

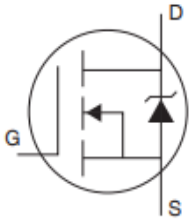
- VDS: 700V
- ID (@VGS=10V): 8A
- RDS_{ON} (@VGS=10V) : < 600mΩ
- High density cell design for extremely low RDS_{ON}
- Excellent on-resistance and DC current capability

Marking Information

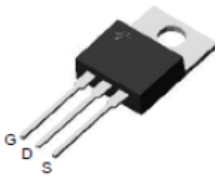


X=Package type
G=Halogen Free
XXXX = Marking Code

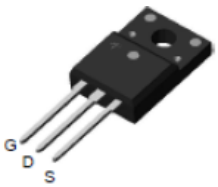
Equivalent Circuit and Pin Configuration



TO-220



TO-220F



Ordering Information

P/N	Package Type	Packaging	Remark
CM70R600P	TO-220	Tube	ROHS
CM70R600PG	TO-220	Tube	Halogen Free
CM70R600F	TO-220F	Tube	ROHS
CM70R600FG	TO-220F	Tube	Halogen Free

Absolute Maximum Ratings (T_C=25 ℃ unless otherwise noted)

Parameter		Symbol	Maximum		Unit
			CM70R600P	CM70R600F	
Drain-source Voltage		V_{DS}	700		V
Gate-source Voltage		V_{GS}	±30		V
Continuous Drain Current (1)	T_C=25°C	I_D	8	8(4)	A
	T_C=100°C		5	5(4)	A
Pulsed Drain Current(2)		I_{DM}	32	32(4)	A
Total Power Dissipation (3)		P_D @ T_C=25°C	104	35	W
		Derating Factor above 25°C	0.8	0.3	W/°C
Thermal Resistance Junction-to-Case (3)		$R_{\theta JC}$	1.2	3.6	°C/W
Junction and Storage Temperature Range		T_J,T_{STG}	-55 to +150		°C

Electrical Characteristics (T_C=25 ℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=700V,V_{GS}=0V,T_C=25°C			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±30V,V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2.0		4.0	V
Static Drain-Source on-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=4A		500	600	mΩ
Diode Forward Voltage	V_{SD}	I_S=8A,V_{GS}=0V			1.4	V
Maximum Body-Diode Continuous Current	I_S				8	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=100V,V_{GS}=0V,f=1MHz		539		pF
Output Capacitance	C_{oss}			26		
Reverse Transfer Capacitance	C_{rss}			2		
Switching Parameters						
Total Gate Charge	Q_g	V_{DS}=480V,I_D=4.0A,V_{GS}=10V		14		nC
Gate Source Charge	Q_{gs}			2.5		
Gate Drain Charge	Q_{gd}			6.8		
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=60V, R_L=15Ω, I_D=4A,R_{GEN}=25Ω		36		ns
Turn-on Rise Time	t_r			18		
Turn-off Delay Time	$t_{D(off)}$			39		
Turn-off Fall Time	t_f			23		

Noted: (1) Pulse Test: Pulse Width≤300us,Duty cycle ≤2%

(2) Pulse width limited by maximum junction temperature

(3) Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch. With 2oz Copper, t≤10s

(4) Drain current limited by maximum junction temperature

Typical Performance Characteristics

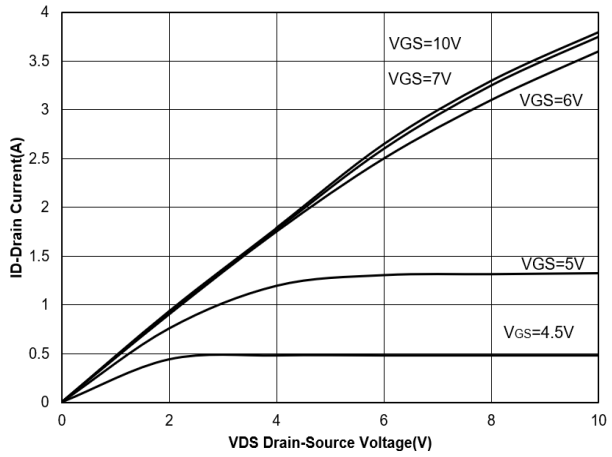


Figure 1. Output Characteristics

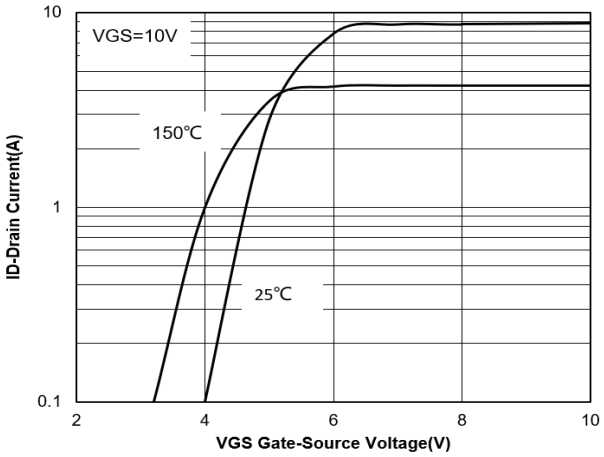


Figure 2. Transfer Characteristics

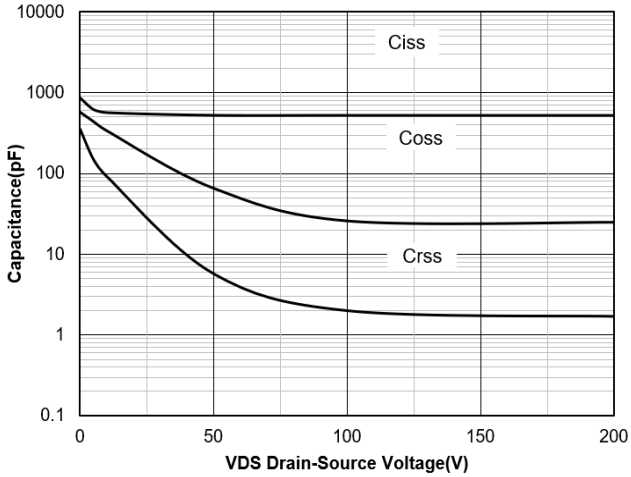


Figure 3. Capacitance Characteristics

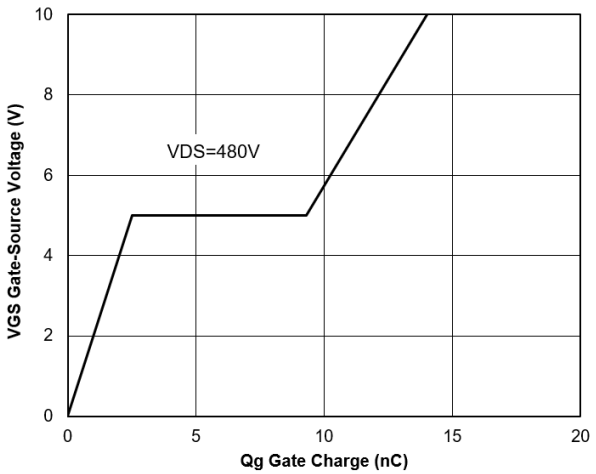


Figure 4. Gate Charge

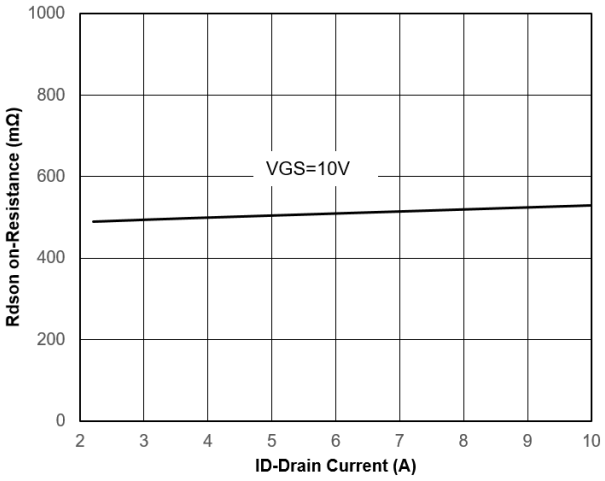


Figure 5. Drain-Source on Resistance

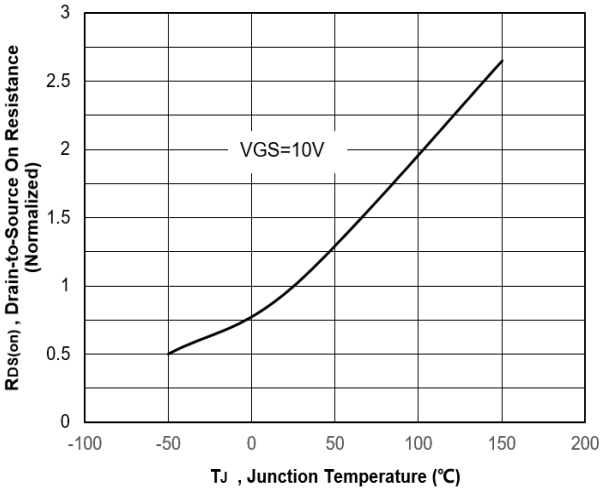


Figure 6. Normalized On-Resistance Vs. Temperature

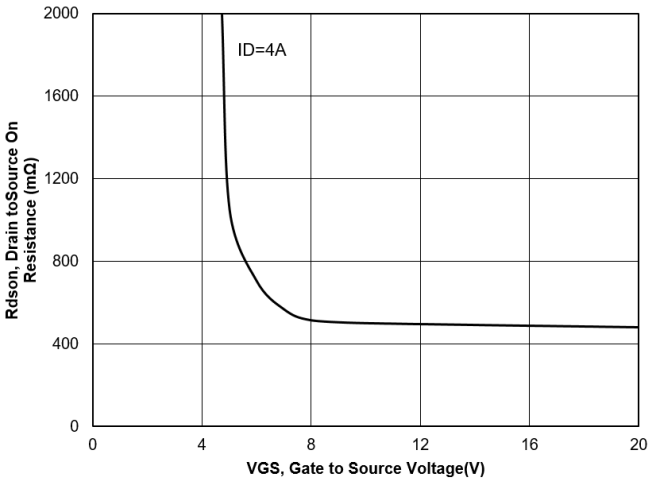


Figure 7. Typical Drain to Source ON Resistance VS Gate Voltage and Drain Current

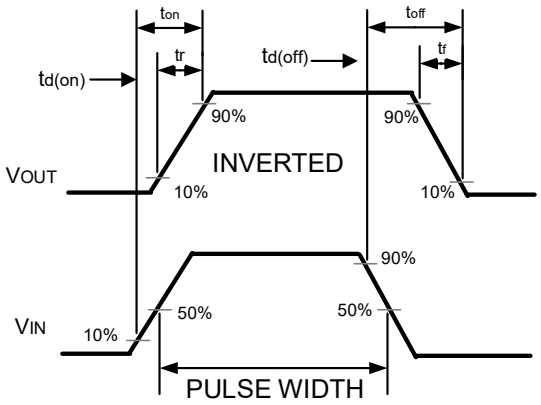


Figure 8. Switching wave

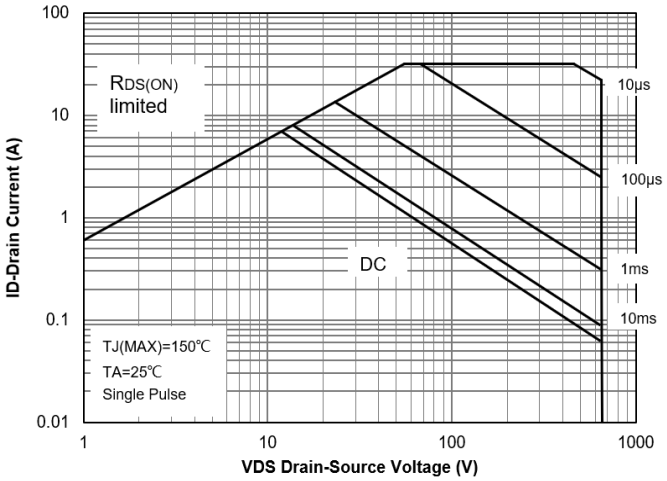


Figure 9. Safe Operation Area
(TO-220)

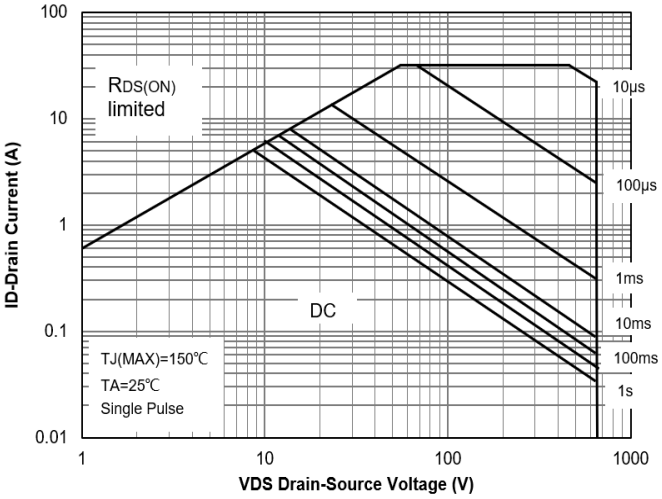


Figure 10. Safe Operation Area
(TO-220F)

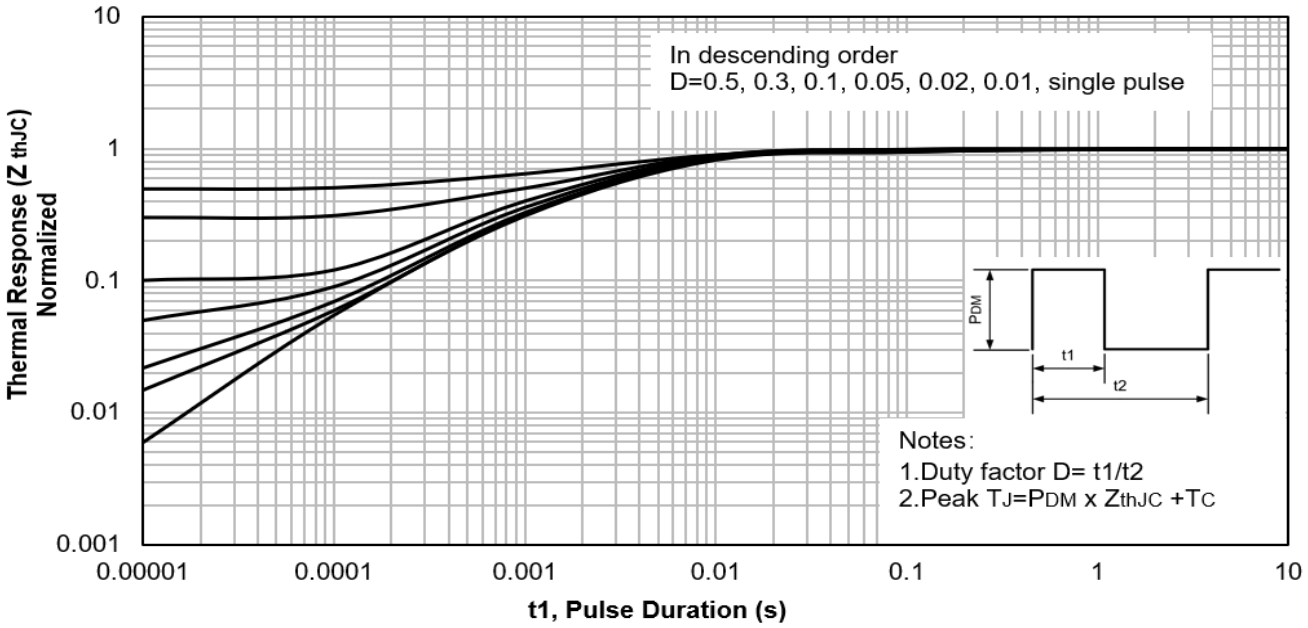


Figure 11. Maximum Effective Transient Thermal Impedance ,Junction-to-Case (TO-220)

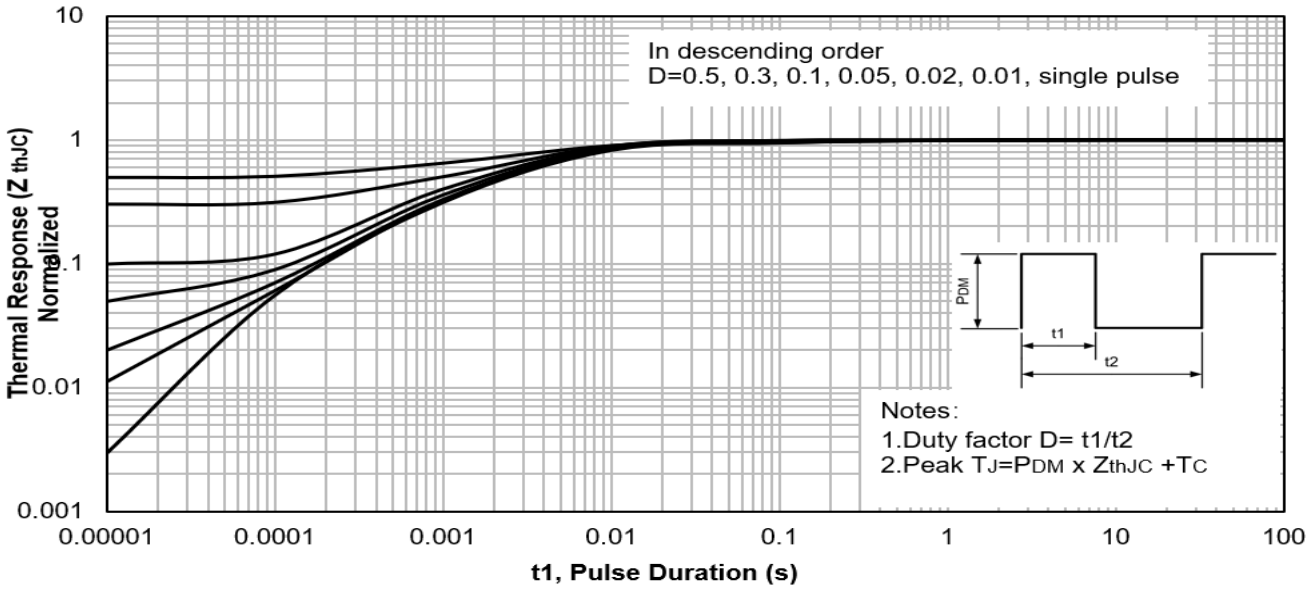
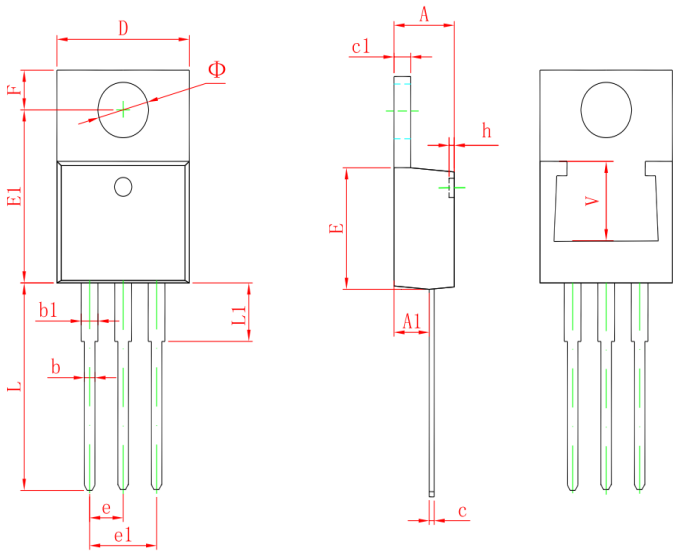


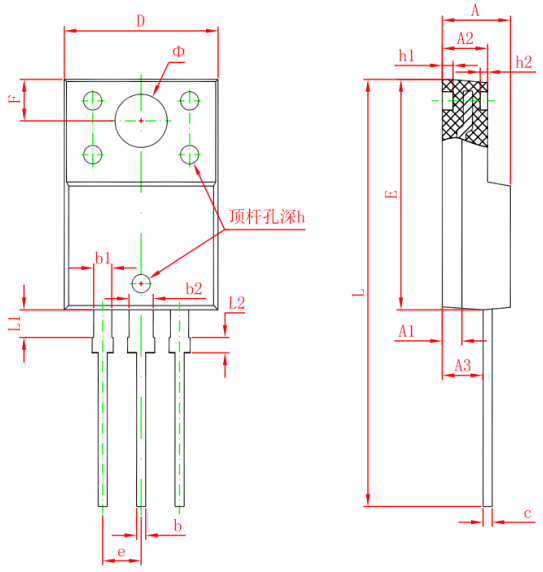
Figure 12. Maximum Effective Transient Thermal Impedance ,Junction-to-Case (TO-220F)

TO-220 Package Outline Drawing



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155
V	5.600 REF.		0.220 REF.	

TO-220F Package Outline Drawing



Symbol	Millimeters		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
h1	0.800REF.		0.031 REF.	
h2	0.500 REF.		0.020 REF.	
L	28.000	28.400	1.102	1.118
L1	1.700	1.900	0.067	0.075
L2	0.900	1.100	0.035	0.043

Contact Information

Applied Power Microelectronics Inc.

Website: http://www.appliedpowermicro.com

Email: sales@appliedpowermicro.com

Phone: +86 (0519) 8399 3606