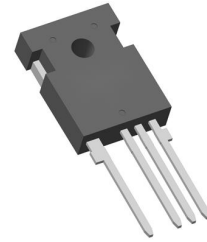


Product Summary

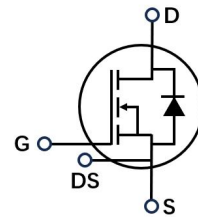
$V_{(BR)CES}$	$R_{DS(ON)} \max$	I_{DS}
1200V	$<22m\Omega @ V_{GS}=18V$	139

Package & Internal Circuit



Description and Applications

- High Blocking Voltage with Low $R_{DS(ON)}$
- Fast Switching Performance
- Fast Intrinsic Diode with Low Reverse Recovery
- High Temperature $R_{ds(on)}$ Ratio Lower
- Inverters
- UPS
- Charging Station
- DC/DC Converter
- Switched mode power supplies



Ordering Information

Part Number	Package Type	Package Qty
CFKQ120SC016	TO-247-4L	240/Tube

Marking Information



Green product

CFXP--Logo
120SC016--Part Number
F-Fab location
A-Assembly location
Y--Year
W--Week
LT--Lot sequence

Absolute Maximum Rating at $T_c=25^\circ\text{C}$ (unless otherwise specified)

Parameter	Symbol	Value	Units
Collector-Emitter voltage	V_{CES}	1200	V
Gate-Source Voltage	V_{GSmax}	-10/+22	V
	V_{GSop}	-5/+18	V
Continuous Drain Current	I_{DS}	139	A
		98	
Diode Pulsed collector current, t_p limited by T_{vjmax}	$I_{DS(pluse)}$	385	A
Power Dissipation	P_D	682	W
Operating Junction Temperature Range	T_j	-55 ~ +175	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +175	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Thermal Resistance, Diodes Junction to Case	$R_{th(j-c)}$	0.22		°C/W

Electrical Characteristics at $T_c = 25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Static Parameters						
V _{(BR)DSS}	Drain - Source breakdown voltage	V _{GS} = 0V,I _{DS} = 1mA	1200			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{CE} = 1200V,V _{GE} = 0V			10	μA
I _{GSS}	Gate-Source Leakage Current	V _{CE} = 0V V _{GE} = -10/+22V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} =10mA	2.0	2.8	4.0	V
R _{DS(ON)}	Drain - Source On-State Resistance	V _{GS} =18V, I _{DS} =100A		16	22	mΩ
C _{iss}	Input Capacitance	V _{DS} = 1000V V _{GS} = 0V f= 1MHz V _{AC} = 25 mV		6116		pF
C _{oss}	Output Capacitance			294		pF
C _{rss}	Reverse Transfer Capacitance			12		pF
R _{G(int)}	Internal Gate Resistance	f= 1MHz, V _{GS} = 25mV		9		Ω
Q _G	Total Gate Charge	V _{DC} = 800V I _{DS} = 100A V _{GS} = -5V to +18V		245		nC
Q _{GS}	Gate to Source Charge			78		nC
Q _{GD}	Gate to Drain Charge			82		nC
Inductive load switching energy						
t _{D(on)}	Turn-On Delay Time	V _{DS} =800V I _{DS} = 100A V _{GS} = -5V to +18V R _{gon} = 2Ω R _{goff} = 2Ω		57.8		nS
t _r	Rise Time			85.8		nS
t _{D(off)}	Turn-Off Delay Time			87.9		nS
t _f	Fall Time			23.2		nS
E _{on}	Turn-On Energy			3.04		mJ
E _{off}	Turn-Off Energy			1.76		mJ
Diode Characteristics at T _c = 25°C						
V _{SD}	Diode Forward Voltage	V _{GS} = -5V,I _{SD} =100A		3.9		V
E _{rr}	Reverse Recover Energy	V _R = 800V V _{GS} = -5V to +18V I _{SD} = 100A di _F /di= 1.3A/ns		0.08		mJ
t _{rr}	Reverse Recovery Time			39		nS
Q _{rr}	Reverse Recovery Charge			599		nC
I _{rrm}	Peak reverse recovery current			25.7		A

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

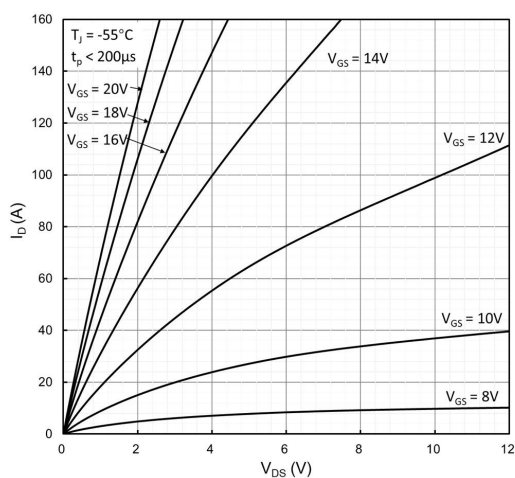


Figure 1: Typical Output characteristics
($I_D = f(V_{DS}, V_{GS})$; $T_J = -55^{\circ}\text{C}$)

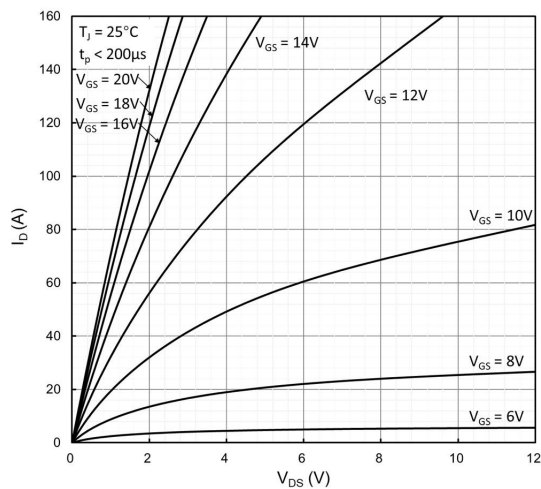
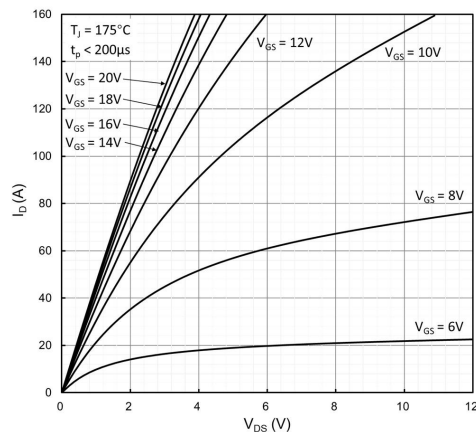
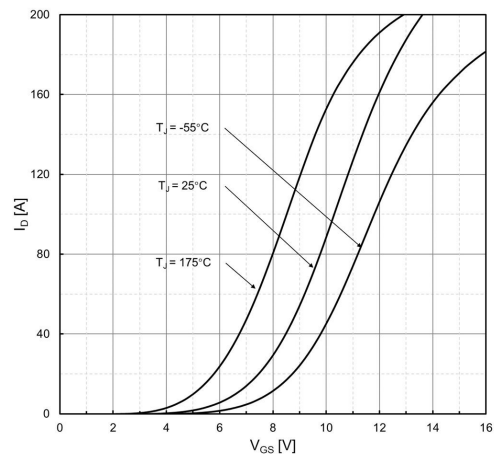


Figure 2: Typical Output characteristics
($I_D = f(V_{DS}, V_{GS})$; $T_J = 25^{\circ}\text{C}$)



($I_D = f(V_{DS}, V_{GS})$; $T_J = 175^{\circ}\text{C}$)



($I_D = f(V_{DS}, V_{GS})$; $V_{DS} = 6\text{V}$)

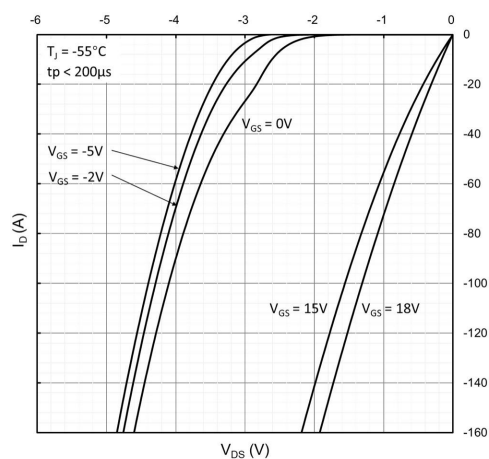


Figure 5: Typical Transfer characteristics
($I_D = f(V_{DS}, V_{GS})$; $T_J = -55^{\circ}\text{C}$)

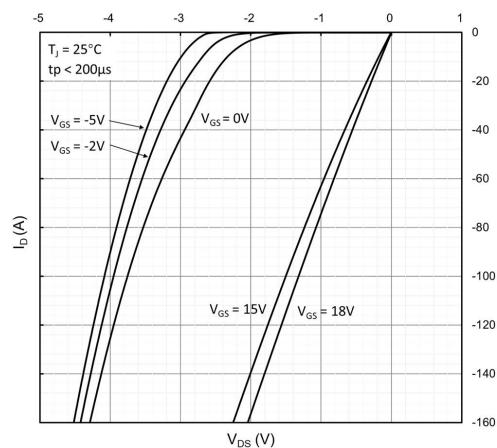


Figure 6: Typical Transfer characteristics
($I_D = f(V_{DS}, V_{GS})$; $T_J = 25^{\circ}\text{C}$)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

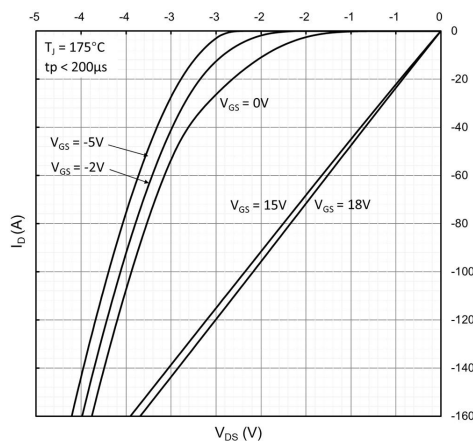


Figure 7: Typical Transfer characteristics
($I_D = f(V_{DS}, V_{GS})$; $T_J = 175^\circ\text{C}$)

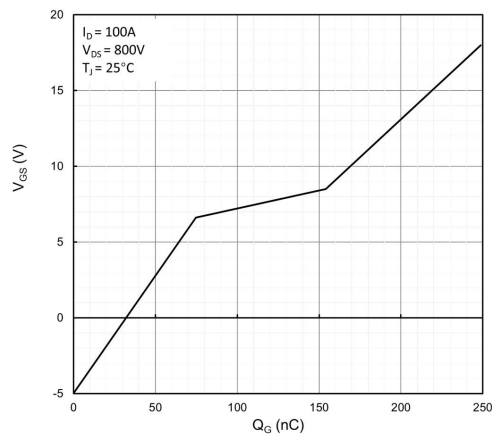


Figure 8: Typical Gate Charge Characteristics
($V_{GS} = f(Q_G)$;

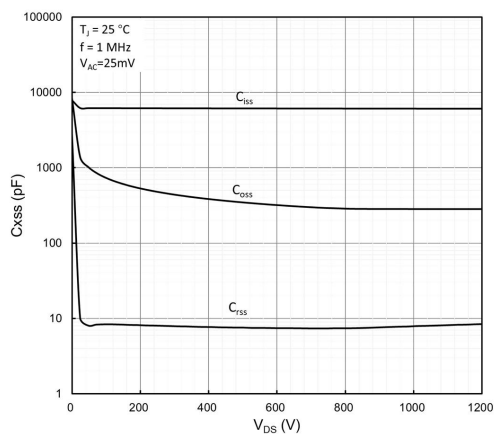


Figure 9: Typical Capacitance Characteristics
($C_{XSS} = f(V_{DS})$; $f = 1\text{ MHz}$)

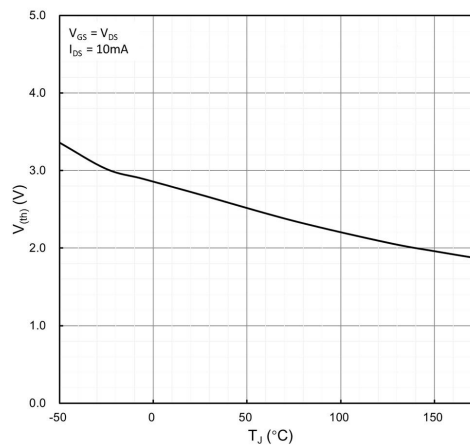


Figure 10: Normalized Gate Threshold vs Temperature
($V_{th(norm.)} = f(T_J)$;

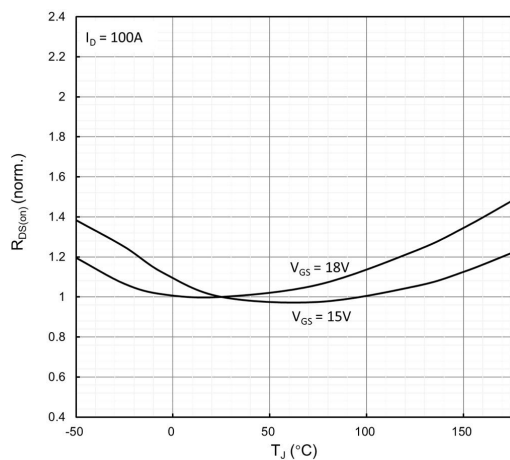


Figure 11: Normalized On-Resistance vs Temp.
($R_{DS(on)(norm.)} = f(T_J)$;

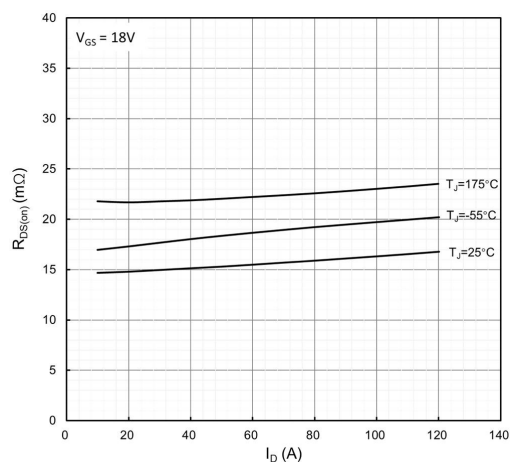


Figure 12: Typical On-Resistance vs Drain Current.
($R_{DS(on)} = f(I_D, T_J)$;

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

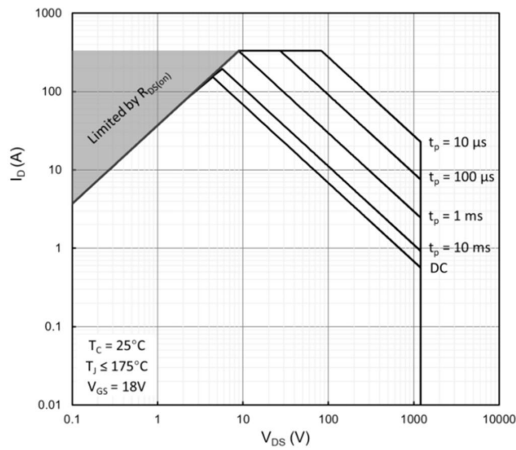


Figure13: Safe Operating Area
($I_{DS} = f(V_{DS}, t_p)$;))

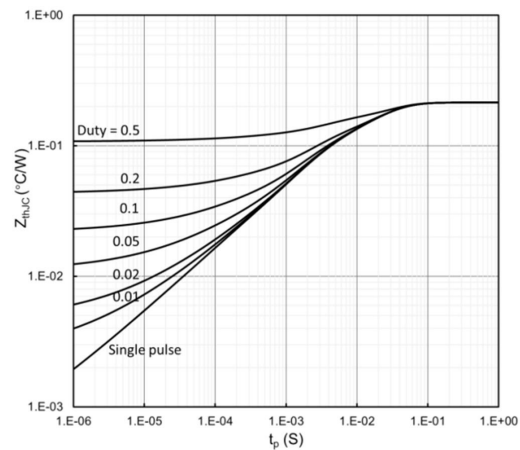


Figure 14: Typical Transient Thermal
Impedance ($Z_{thJC} = f(t_p, D)$;))

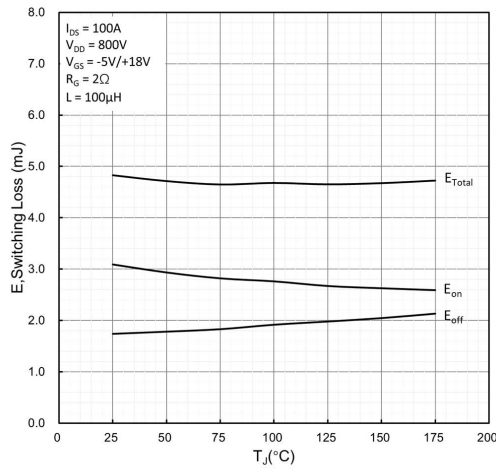


Figure 15: Typical Switching Energy vs
Temperature ($E = f(T_J)$;))

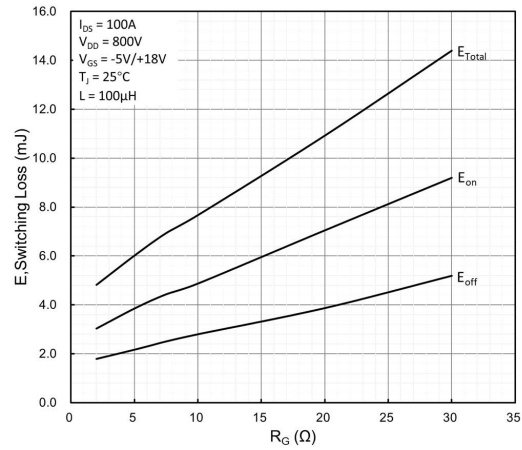


Figure 16: Typical Switching Energy vs Gate
Resistance ($E = f(R_G)$;))

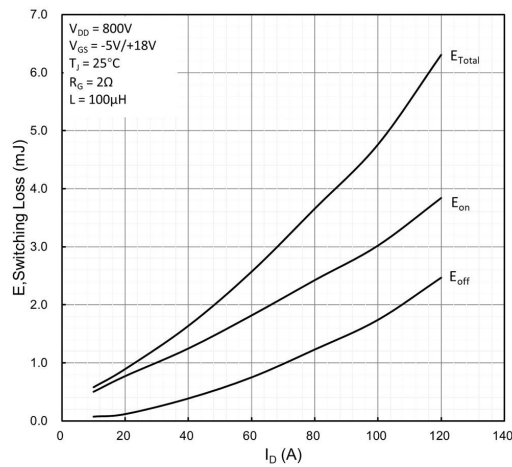


Figure 17: Typical Switching Energy vs Drain
Current ($E = f(I_D)$;))

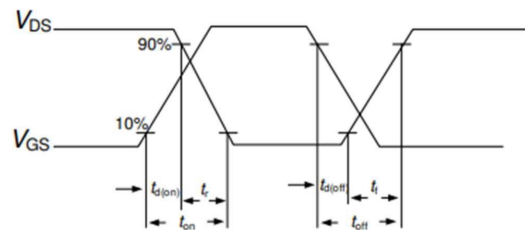
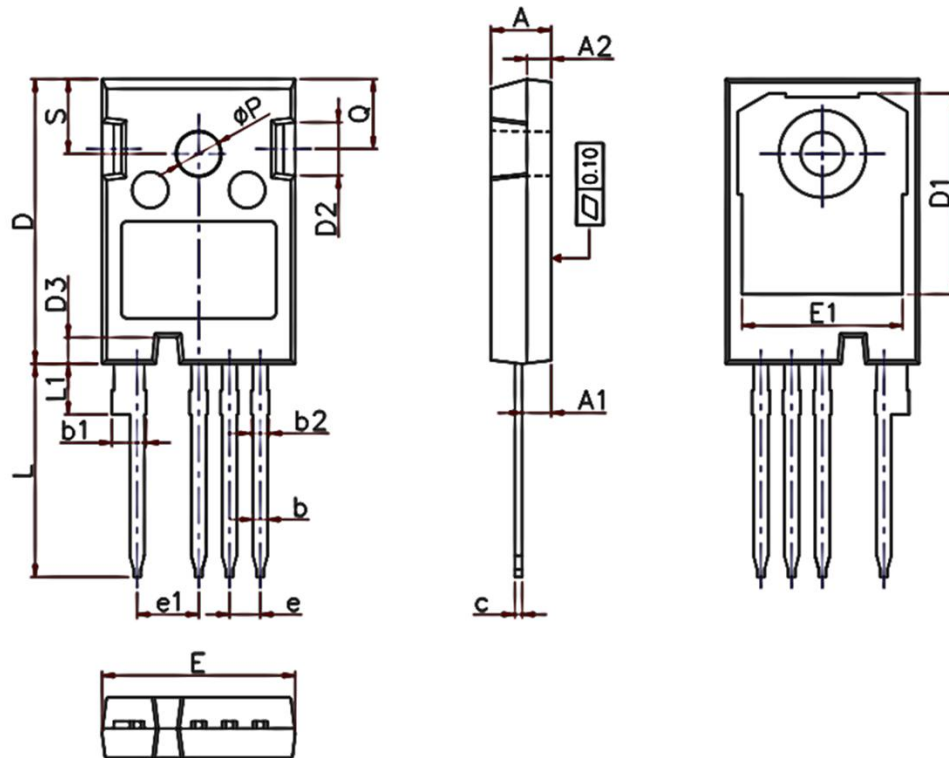


Figure 18: Switching Times Definition

TO-247-4 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.830	5.210	0.190	0.205
A1	2.290	2.540	0.090	0.100
A2	1.910	2.160	0.075	0.085
b	1.070	1.330	0.042	0.052
b1	2.390	2.940	0.094	0.116
b2	1.070	1.600	0.042	0.063
c	0.550	0.680	0.022	0.027
D	23.300	23.600	0.917	0.929
D1	16.350	16.750	0.644	0.659
D2	3.680	5.100	0.145	0.201
D3	2.350	2.650	0.093	0.104
E	15.750	16.130	0.620	0.635
E1	13.110	13.410	0.516	0.528
e	2.54 BSC		0.1 BSC	
e1	5.08 BSC		0.2 BSC	
L	17.310	17.820	0.681	0.702
L1	3.970	4.370	0.156	0.172
P	3.510	3.650	0.138	0.144
Q	5.49	6	0.216	0.236
S	6.150 BSC.		0.242 BSC	

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