Descriptions

This is N-CHANNEL 650V 11A Super-Junction Power MOSFET in a TO-220F Plastic Package

Features

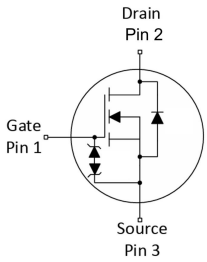
- Fast Switching
- Low $R_{DS\ (on)}$ Resistance
- Low Gate Charge
- Low Switching Loss
- Integrated ESD Protection Diode
- 100% Single Pulse Avalanche Energy Test
- Pb-free lead plating and RoHS compliant

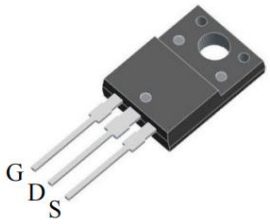
Parameter	Value	Unit
V_{DSS}	650	V
$R_{DS(ON)max.}V_{GS}$=10V	340	mΩ
I_D	11	A
Q_G	17.6	nC

Applications

- AC to DC Converter
- Electronic Ballasts and LED lighting power
- Consumer electronics Adaptor or Charger
- Network equipment and Display power supply unit
- Switch Mode Power Supply

Equivalent Circuit & Pinning





TO-220F

Absolute Maximum Ratings(Ta=25℃)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Drain Current-Continuous Note4	T_C= 25℃	I_D	11	A
	T_C= 125℃		6.6	A
Drain Current-Pulsed Note1	T_C= 25℃	I_{DM}	24.4	A
Avalanche Current		I_{AS}	3.3	A
Single Pulse Avalanche Energy Note3		E_{AS}	43	mJ
Maximum Power Dissipation	T_C= 25℃	Ptot	59.5	W
Operating Junction Temperature Range		T_J	-55 to 150	℃

Thermal Resistance Ratings

Parameter	Conditions	Min.	Typ.	Max.	Unit
Thermal resistance, Junction-to-Ambient Note2	Steady State			76	℃/W
Thermal resistance, Junction-to-Case	Steady State			2.1	℃/W

Notes:
1. Pulse Test: Pulse Width ≤ 380μs,Duty Cycle ≤ 2%.
2. For surface-mounted devices, both RthJC and RthJACare measured with the device mounted on approximately 1”×1”FR-4 PCBs. In actual applications, many factors including the PCB material and layout, may affect the thermal resistance of the device-board assembly. For best results, characterize the thermal resistance
directly in the application circuit.
3. Starting TJ=25°C, VD=100V, L=8mH, VGS=10V.
4. The maximum current rating is package limited.

Electrical Characteristics(Ta=25℃)

STATIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_{DS}=250μA	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V, T_J=25°C			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V			±1	μA

STATIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_{DS}=250μA	2.5	3.0	3.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_{DS}=4.0A		313	340	mΩ
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		12.1		Ω

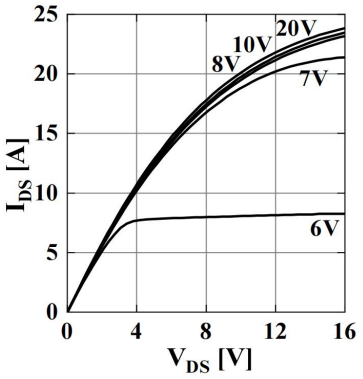
DYNAMIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Input Capacitance	C_{iss}	V_{DS}=325V,V_{GS}=0V, f=500KHz		732		pF
Output Capacitance	C_{oss}	V_{DS}=325V,V_{GS}=0V, f=500KHz		23.3		pF
Reverse Transfer Capacitance	C_{rss}	V_{DS}=325V,V_{GS}=0V, f=500KHz		6		pF
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=400V, V_{GS}=10V, I_{DS}=6A, R_G=10Ω		14.4		ns
Rise Time	t_r	V_{DS}=400V, V_{GS}=10V, I_{DS}=6A, R_G=10Ω		23.9		ns
Turn-Off Delay Time	$T_{d(off)}$	V_{DS}=400V, V_{GS}=10V, I_{DS}=6A, R_G=10Ω		58.3		ns
Fall Time	t_f	V_{DS}=400V, V_{GS}=10V, I_{DS}=6A, R_G=10Ω		44.1		ns

GATE CHARGE CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	Min.	Typ.	Max.	Unit
Gate to Source Gate Charge	Q_{gs}	V_{DD}=200V, I_D=6A,V_{GS}=10V		4.7		nC
Gate to Drain Charge	Q_{gd}	V_{DD}=200V, I_D=6A,V_{GS}=10V		5.7		nC
Gate Charge Total	Q_G	V_{DD}=200V, I_D=6A,V_{GS}=10V		17.6		nC

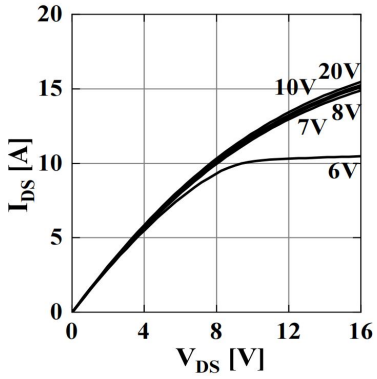
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	**Symbol**	**Conditions**	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=6A		0.84	1.0	V
Body Diode Reverse Recovery Time	t_{rr}	V_{DD}=100V, I_F=6A, di/dt=100A/μs		279		ns
Body Diode Reverse Recovery Charge	Q_{rr}	V_{DD}=100V, I_F=6A, di/dt=100A/μs		2008		nC
Reverse Recovery Current	I_{RRM}	V_{DD}=100V, I_F=6A, di/dt=100A/μs		14.3		A

Electrical Characteristic Curve

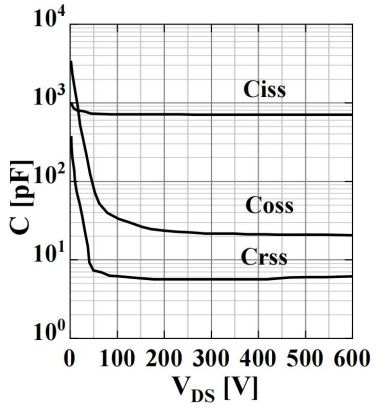
TYP.Output characteristics T=25℃



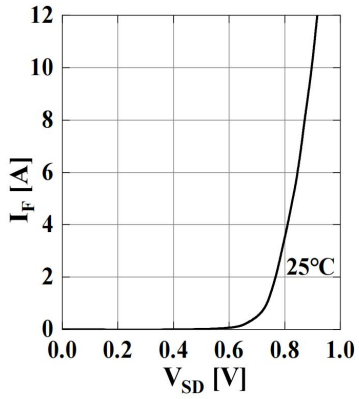
TYP.Output characteristics T=125℃



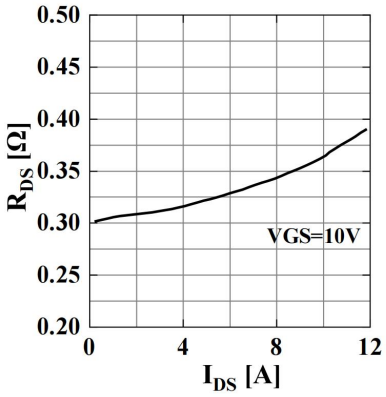
TYP.Capatiances



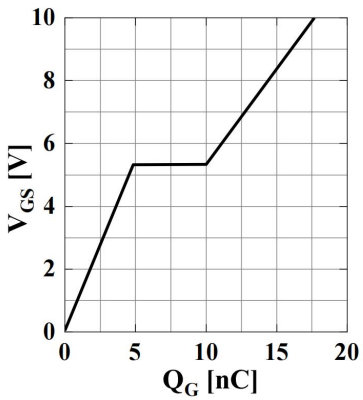
TYP.Forward characteristics of reverse diode



TYP.Drain-Source on-state



TYP.Gate charge



Marking Instructions

Note:

COT: Company Code

65R340: Product Type.

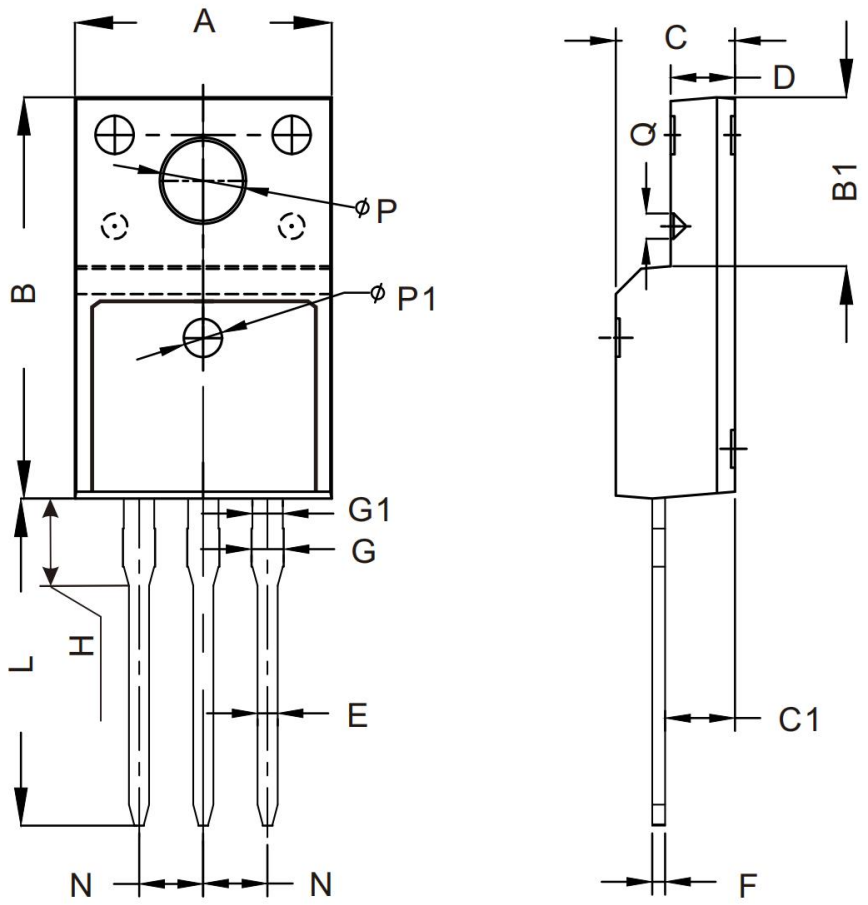
******: *: Inner Code * : Year Code **: Week Code **: Lot Code.

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing
CT65R340FA	Halogen-Free	TO-220F	HF	Tube

Package Outline Dimensions

TO-220F



Symbol	Millimeters		Symbol	Millimeters	
	Min.	Max.		Min.	Max.
A	9.60	10.4	G	1.12	1.42
B	15.4	16.2	G1	1.10	1.40
B1	6.30	6.90	H	3.40	3.80
C	4.30	4.90	L	12.0	14.0
C1	2.20	3.00	N	2.34	2.74
D	2.40	2.90	ØP	3.00	3.30
E	0.60	1.00	ØP1	1.35	1.75
F	0.30	0.60	Q	0.80	1.20