Descriptions

This is N-CHANNEL 650V 13.2A Super-Junction Power MOSFET in a TO-220F Plastic Package

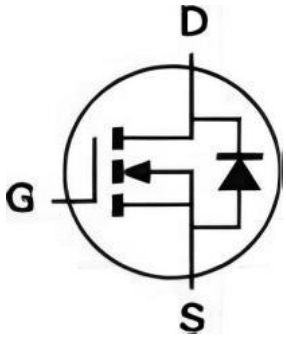
Features

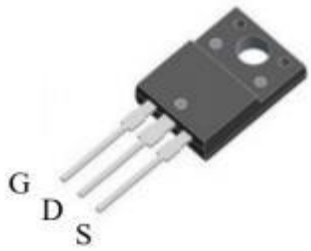
- Optimized for synchronous rectification
- Low Input Capacitance
- Low Miller Capacitance
- Fully Characterized Capacitance and Avalanche
- Pb-free lead plating; RoHS compliant

Applications

- BLDC Motor drive applications
- Battery powered circuits
- Synchronous rectifier applications
- Resonant mode power supplies

Equivalent Circuit & Pining





TO-220F

Marking

See Marking Instructions.

Absolute Maximum Ratings(Ta=25℃)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		VDS	650	V
Gate-Source Voltage		VGS	±30	V
Drain Current-Continuous Note1	TC= 25℃	ID	13.2	A
	TC= 125℃		8.4	A
Drain Current-Pulsed Note2	TC= 25℃	IDM	39.6	A
Avalanche Current		IAS	5.6	A
Single Pulse Avalanche Energy Note3		EAS	313.6	mJ
Maximum Power Dissipation	TC= 25℃	Ptot	30	W
Storage Temperature Range		TSTG	-55 to 150	℃
Operating Junction Temperature Range		TJ	-55 to 150	℃

Thermal Resistance Ratings

Parameter	Conditions	Min.	Typ.	Max.	Unit
Thermal resistance, Junction-to-Ambient Note4	Steady State			80	℃/W
Thermal resistance, Junction-to-Case Note4	Steady State			4.2	℃/W

Notes:

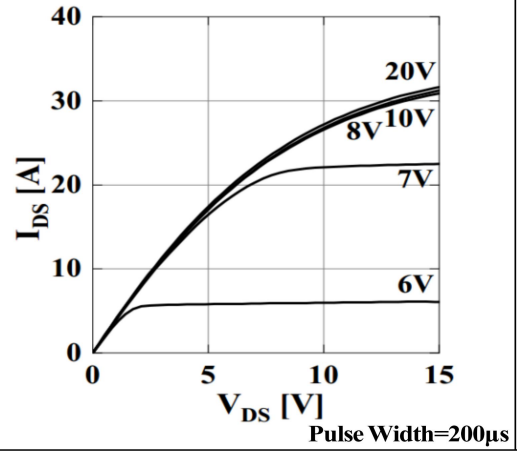
1. The maximum current rating is package limited.
2. Pulse Test: Pulse Width ≤ 10μs.
3. Starting T_J=25°C, V_D=50V, L=20mH, V_{GS}=10V.
4. For surface-mounted devices, both R_{thJC} and R_{thJA}Care measured with the device mounted on approximately 1”×1”FR-4 PCBs. In actual applications, many factors 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.

Thermal Characteristics(TJ=25°C)

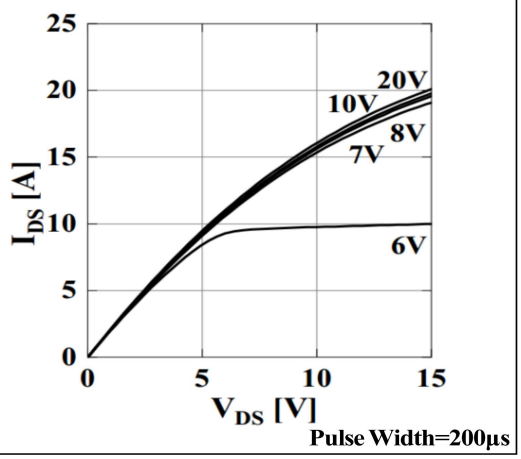
STATIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, IDS=250μA	650			V
Zero Gate Voltage Drain Current	IDSS	VDS=650V,VGS=0V, TJ=25°C			1	μA
		VDS=650V,VGS=0V, TJ=125°C			100	μA
Gate-Source Leakage Current	IGSS	VGS=±30V,VDS=0V			±100	nA
STATIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Gate Threshold Voltage	VGS(TH)	VDS=VGS, IDS=250μA	3.5		4.5	V
Drain-Source On-State Resistance	RDS(ON)	VGS=10V, IDS=6.7A		239	260	mΩ
Gate Resistance	Rg	VGS=0V, VDS=0V, f=1MHz		4		Ω
DYNAMIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Input Capacitance	Ciss	VDS=100V,VGS=0V, f=100kHz		1124		pF
Output Capacitance	Coss	VDS=100V,VGS=0V, f=100kHz		40		pF
Reverse Transfer Capacitance	Crss	VDS=100V,VGS=0V, f=100kHz		1.1		pF
Turn-On Delay Time	Td(on)	VDS=400V,VGS=18V,IDS=6.7A, RG=3Ω		15.4		ns
Rise Time	tr	VDS=400V,VGS=18V,IDS=6.7A, RG=3Ω		47.6		ns
Turn-Off Delay Time	Td(off)	VDS=400V,VGS=18V, IDS=6.7A, RG=3Ω		8.4		ns
Fall Time	tf	VDS=400V,VGS=18V, IDS=6.7A, RG=3Ω		44.4		ns
GATE CHARGECHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Gate to Source Gate Charge	Qgs	VGS= 0 to 10V,VDD=400V, ID=6.7A		5.4		nC
Gate to Drain Charge	Qgd	VGS= 0 to 10V, VDD=400V, ID=6.7A		9.3		nC
Gate Charge Total	QG	VGS= 0 to 10V, VDD=400V, ID=6.7A		25.3		nC
GATE CHARGECHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Gate to Source Gate Charge	Qgs	VGS= 0 to 10V,VDD=400V, ID=6.7A		5.4		nC
Gate to Drain Charge	Qgd	VGS= 0 to 10V, VDD=400V, ID=6.7A		9.3		nC
Gate Charge Total	QG	VGS= 0 to 10V, VDD=400V, ID=6.7A		25.3		nC

Electrical Characteristics (TJ=25°C unless otherwise noted)

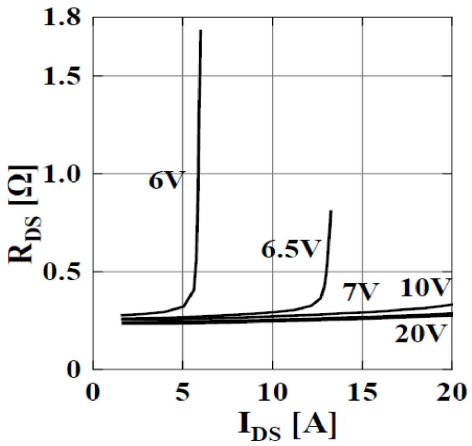
TYP.Output Characteristics T=25°C



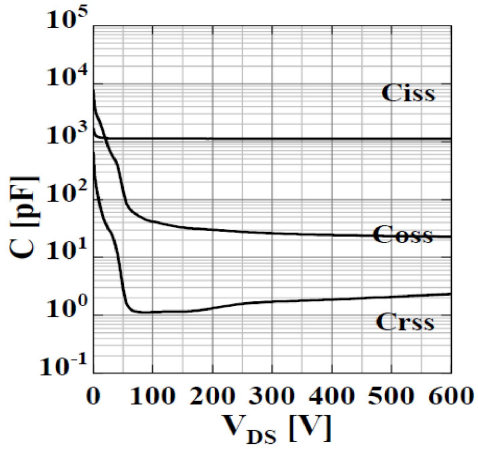
TYP.Output Characteristics T=125°C



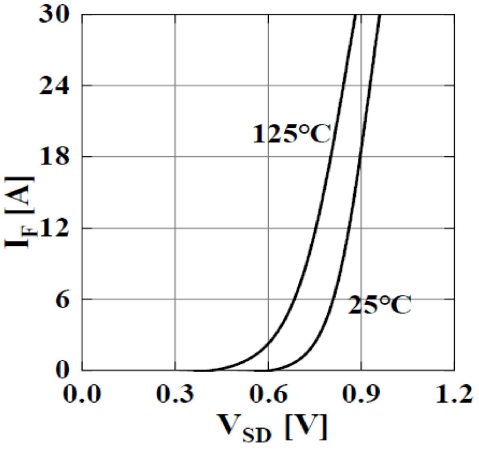
TYP.Drain-Source On-Resistance vs Drain Current



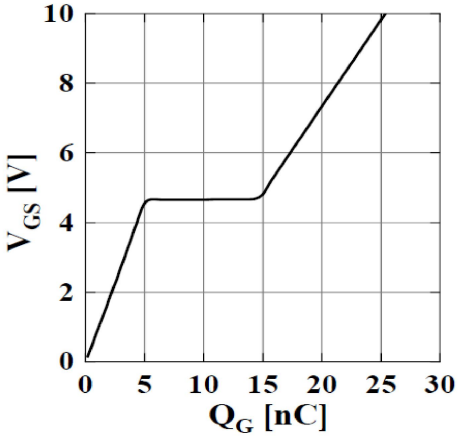
TYP.Capacitances



TYP.Body Diode Characteristics



TYP.Gate Charge



Marking codes

Note:

COT: Company Code

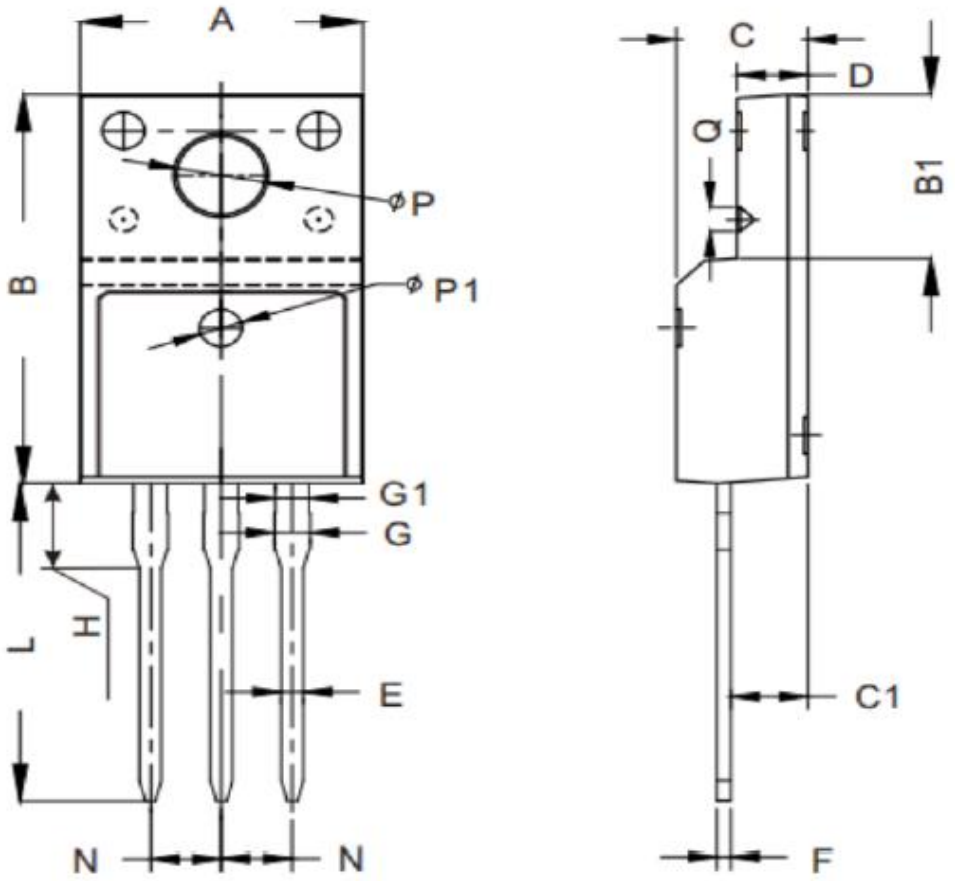
65R260: Product Type.

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

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing
CT65R260FA	Halogen-Free	TO-220F	FA	Tube

Mechanical Dimensions For 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	2.56	2.96	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