

Descriptions

This is N-CHANNEL 650V 74A Super-Junction Power MOSFET in a TO-247-3L Plastic Package

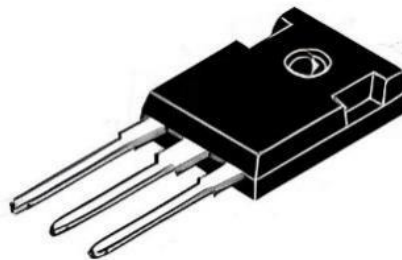
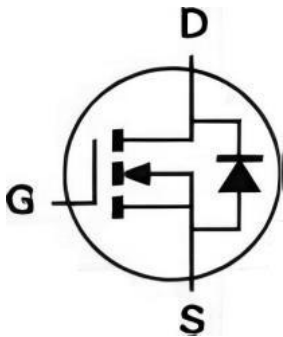
Features

- 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-247-3L

Marking

See Marking Instructions.

Absolute Maximum Ratings(Ta=25°C)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		VDS	650	V
Gate-Source Voltage		VGS	±30	V
Drain Current-Continuous Note4	TC= 25°C	ID	74	A
	TC= 125°C		46	A
Drain Current-Pulsed Note1	TC= 25°C	IDM	223	A
Avalanche Current		IAR	14	A
Single Pulse Avalanche Energy Note3		EAS	1960	mJ
Maximum Power Dissipation	TC= 25°C	Ptot	521	W
Operating Junction Temperature Range		TJ	-55 to 150	°C

Thermal Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Thermal resistance, Junction-to-Ambient Note2	Steady State			62	°C/W
Thermal resistance, Junction-to-Case	Steady State			0.24	°C/W

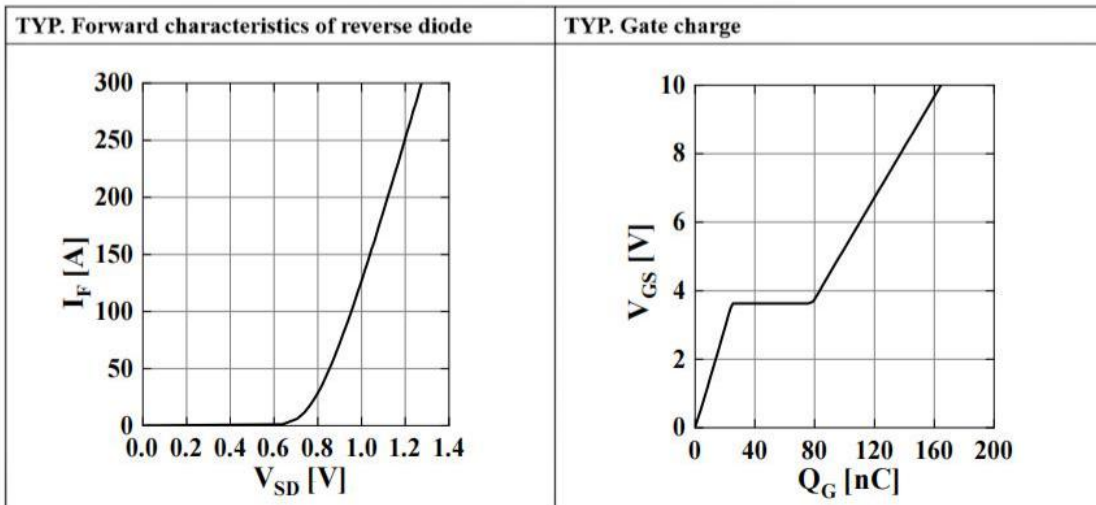
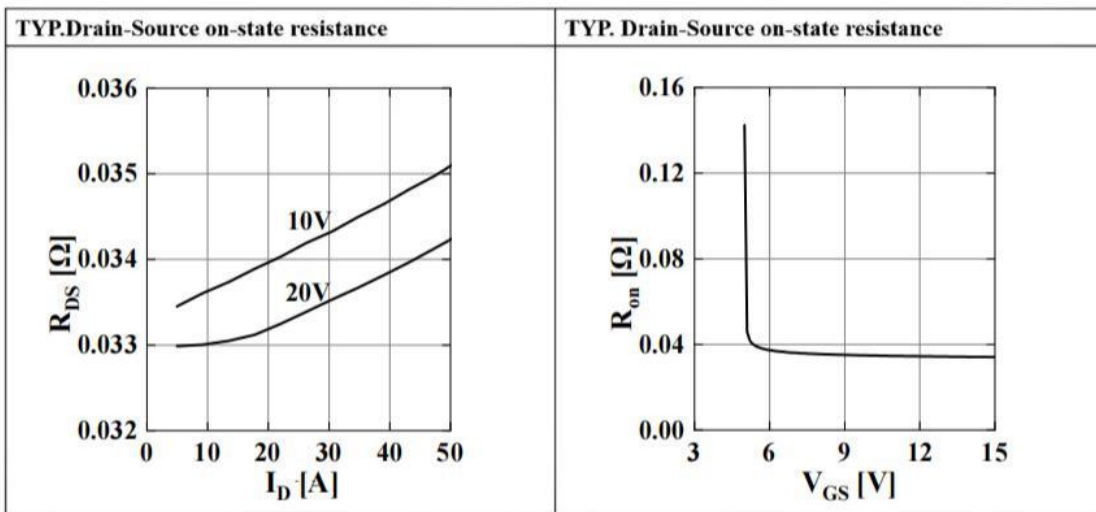
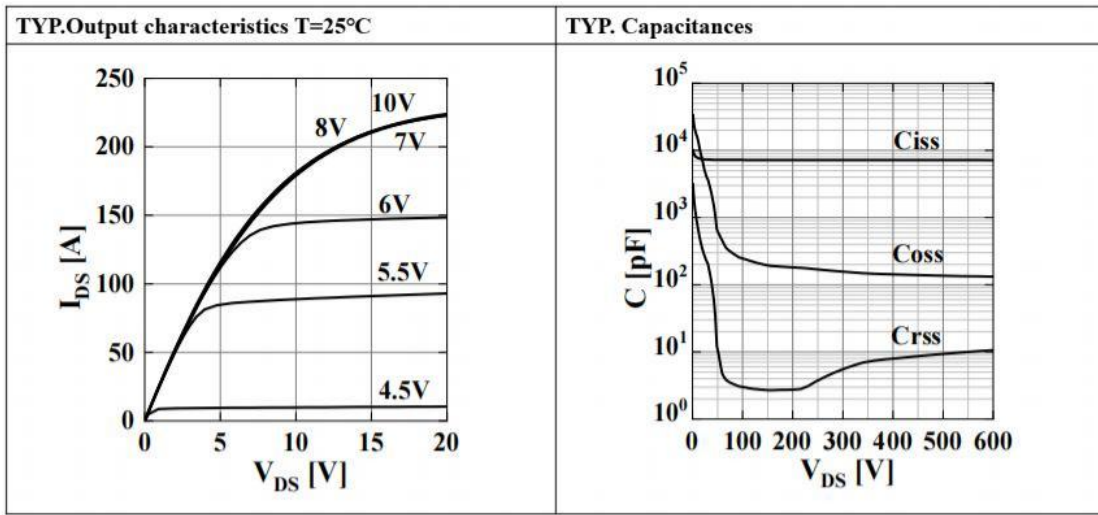
Notes:

1. Pulse Test:Pulse Width ≤ 10ms, Duty Cycle ≤ 1%.
2. For surface-mounted devices, both RthJC and RthJA are 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=50V, L=20mH, VGS=10V.
4. The maximum current rating is package limited.

Electrical Characteristics(Ta=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	2.5		3.5	V
Drain-Source On-State Resistance	RDS(ON)	VGS=10V, IDS=45A		35	41	mΩ
Drain-Source On-State Resistance	RDS(ON)	VGS=10V, IDS=18A		34	38	mΩ
Gate Resistance	Rg	VGS=0V, VDS=0V, f=1MHz		1.5		Ω
DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	Ciss	VDS=100V, VGS=0V, f=100KHz		7210		pF
Output Capacitance	Coss	VDS=100V, VGS=0V, f=100KHz		248		pF
Reverse Transfer Capacitance	Crss	VDS=100V, VGS=0V, f=100KHz		2.99		pF
Turn-On Delay Time	Td(on)	VDS=480V, VGS=18V, IDS=45A, RG=3Ω		33.92		ns
Rise Time	tr	VDS=480V, VGS=18V, IDS=45A, RG=3Ω		72		ns
Turn-Off Delay Time	Td(off)	VDS=480V, VGS=18V, IDS=45A, RG=3Ω		160		ns
Fall Time	tf	VDS=480V, VGS=18V, IDS=45A, RG=3Ω		20.8		ns
GATE CHARGE CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate to Source Gate Charge	Qgs	VDD=400V, ID=45A		31.9		nC
Gate to Drain Charge	Qgd	VDD=400V, ID=45A		60.6		nC
Gate Charge Total	QG	VDD=400V, ID=45A, VGS= 10V		165		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Diode Forward Voltage	VSD	VGS=0V, IF=45A		0.82	1.08	V
Body Diode Reverse Recovery Time	trr	VDD=480V, IF=18A, di/dt=100A/μs		362.5	-	ns
Body Diode Reverse Recovery Charge	Qrr	VDD=480V, IF=18A, di/dt=100A/μs		13.7	-	μC
Reverse Recovery Current	IRRM	VDD=480V, IF=18A, di/dt=100A/μs		75		A

Typical Operating Characteristics



Marking codes

Note:

COT: Company Code

65R041: Product Type.

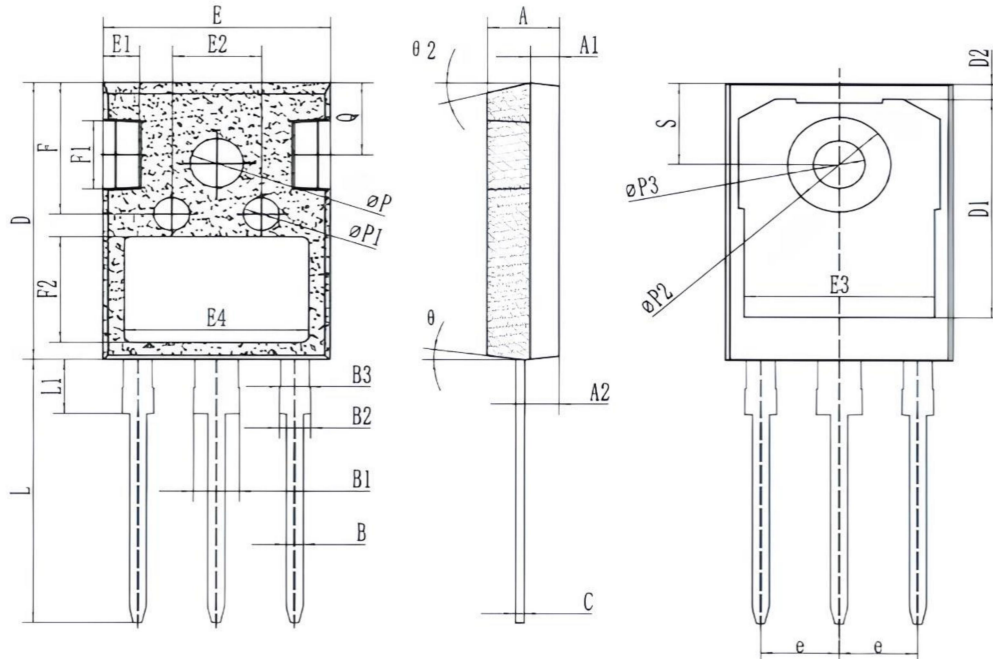
*****: *: Inner Code * : Year Code **: Week Code **: Lot Code.

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing
CT65R041HA	Halogen-Free	TO-247-3L	HA	Tube

Mechanical Dimensions

TO-247-3L



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.9	5	5.1
A1	1.9	2	2.1
A2	2.3	2.4	2.5
B	1.14	1.19	1.24
B1	3.05	3.15	3.25
B2	2	2.1	2.2
B3	1.9	2	2.1
C	0.55	0.6	0.65
D	20.8	21	21.2
D1	16.35	16.55	16.75
D2	1.02	1.17	1.32
E	15.6	15.8	16
E1	2.4	2.5	2.6
E2	6.1	6.2	6.3
E3	13.06	13.26	13.46
E4	12.7	12.8	12.9
F	9.8	10	10.2
F1	4.8	5.1	5.4
F2	7.9	8	8.1
e	5.436 BSC		
L	19.72	19.92	20.12
L1	3.9	4.1	4.3
ϕP	3.55	3.75	3.95
$\phi P1$	2.4	2.5	2.6
$\phi P2$	7.09	7.19	7.29
$\phi P3$	3.5	3.6	3.7
S	6.05	6.15	6.25
Q	5.4	5.5	5.6
θ	5°	7°	9°
1	5°	7°	9°
2	13°	15°	17°