Descriptions

This is super junction MOSFET with fast body diode. series provide all benefits of a fast switching SJ-MOSFET while offering an extremely fast body diode. makes especially resonant switching applications more reliable.

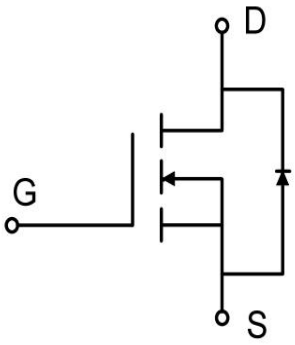
Features

- VDS =700V @ Tj,max
- Typ. RDS(on) =0.025Ω
- 100% UIS tested
- Pb-free plating, Halogen free

Applications

- LED Lighting
- Charger
- Adapter
- PC
- LCD TV
- Server

Equivalent Circuit & Pining



TO-247

Marking

See Marking Instructions.

Absolute Maximum Ratings(Ta=25℃)

Parameter	Symbol	CT65R025HA	Unit
Drain-source voltage	VDSS	650	V
Continuous drain current[1] (TC = 25°C)	ID	90	A
(TC = 100°C)		50	A
Pulsed drain current[2]	IDM	295	A
Gate-source voltage	VGS	±30	V
Avalanche energy, single pulse[3]	EAS	1100	mJ
Avalanche energy, repetitive[2]	EAR	1.4	mJ
Avalanche current, repetitive[2]	IAR	7	A
Power dissipation (TC = 25°C)	PD	43	W
- Derate above 25°C		3.44	W/°C
Operating and storage temperature range	Tj, Tstg	-55 to +150	°C
Continuous diode forward current	IS	90	A
Diode pulse current	IS,pulse	295	A

Thermal Characteristics

Parameter	Symbol	CT65R025HA	Unit
Thermal resistance, junction-to-case	RθJC	0.29	°C/W
Thermal resistance, junction-to-ambient	R JA	62	°C/W

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0 V, I_D=1 mA	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=0.25mA	2.5	3.5	4.5	V
Drain cut-off current	I_{DSS}	V_{DS}=650 V, V_{GS}=0V, T_j = 25°C T_j = 125°C	 - -	 - 400	 60 -	μA
Gate leakage current, forward	I_{GSSF}	V_{GS}=20V, V_{DS}=0V	-	-	500	nA
Gate leakage current, reverse	I_{GSSR}	V_{GS}=-20V, V_{DS}=0V	-	-	-500	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10 V, I_D=30A T_j = 25°C	- -	 0.025	 0.033	Ω
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}= 100V, V_{GS}= 0V, f = 1 MHz	-	8200	-	pF
Output capacitance	C_{oss}		-	250	-	
Reverse transfer capacitance	C_{rss}		-	4.2	-	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 300V, I_D = 30A R_G = 25Ω, V_{GS}=10V	-	90	-	ns
Rise time	t_r		-	79	-	
Turn-off delay time	$t_{d(off)}$		-	460	-	
Fall time	t_f		-	75	-	
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DD}=480V, I_D=30A, V_{GS}=0 to 10V	-	35	-	nC
Gate to drain charge	Q_{gd}		-	42	-	
Gate charge total	Q_g		-	142	-	
Gate plateau voltage	$V_{plateau}$		-	5.0	-	V
Reverse diode characteristics						
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=30A	-	-	1.2	V
Reverse recovery time	t_{rr}	V_R=50V, I_F=30A, dI_F/dt=100A/μs	-	200	-	ns
Reverse recovery charge	Q_{rr}		-	3.9	-	μC
Peak reverse recovery current	I_{rrm}		-	35	-	A

Notes:

1. Limited by $T_{j\ max}$. Maximum duty cycle D=0.5.
2. Repetitive rating: pulse width limited by maximum junction temperature.
3. I_{AS} = 6 A, V_{DD} = 50V, R_G = 25Ω, starting T_j = 25°C

Electrical Characteristic Curve

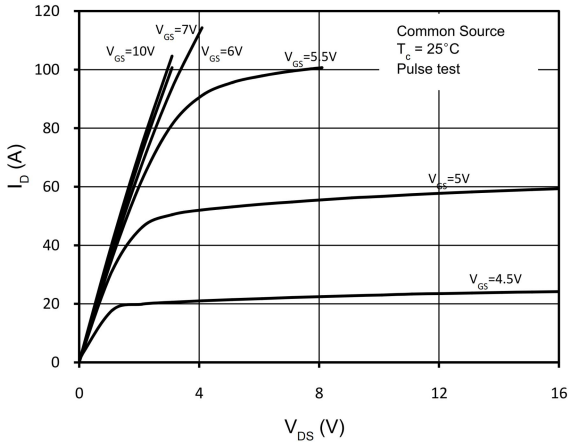


Figure 1.On-Region Characteristics

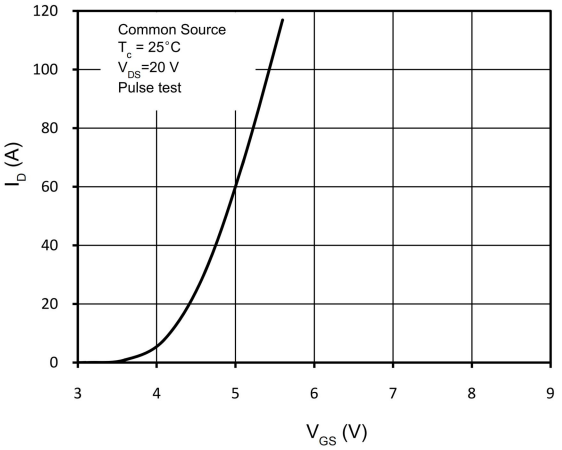


Figure 2. Transfer Characteristics

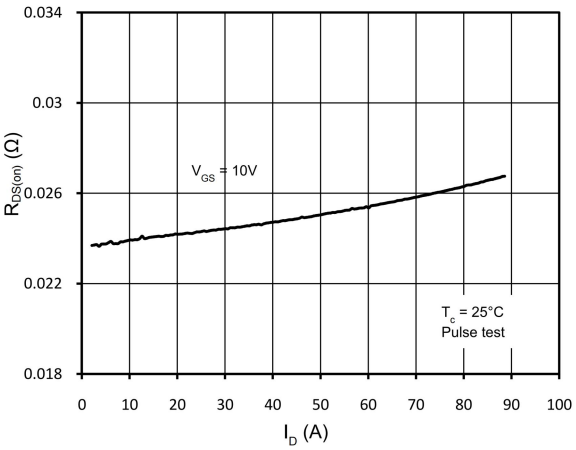


Figure 3. Static Drain-Source On Resistance

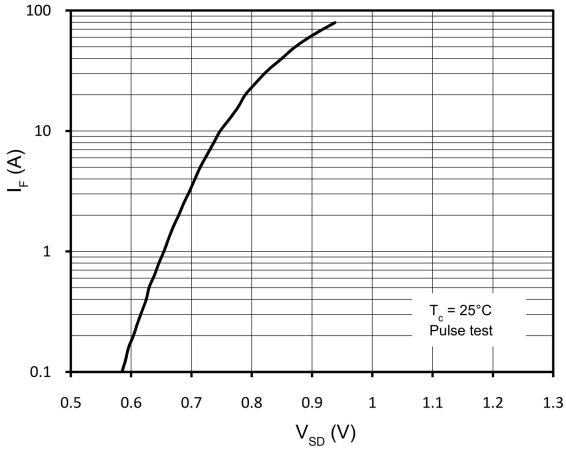


Figure 4. Body- Diode Forward Characteristics

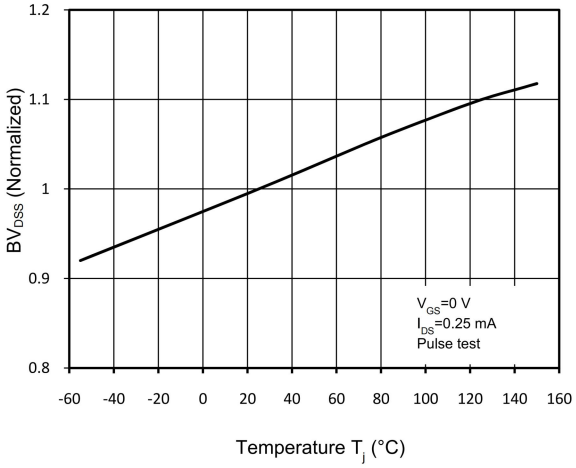


Figure 5. Normalized BV_{DSS} vs. Temperature

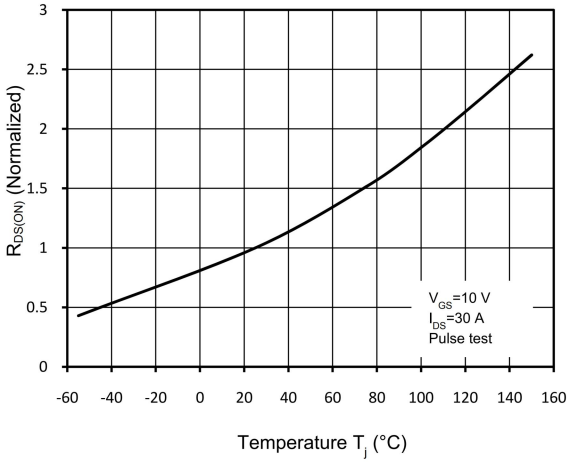


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Electrical Characteristic Curve

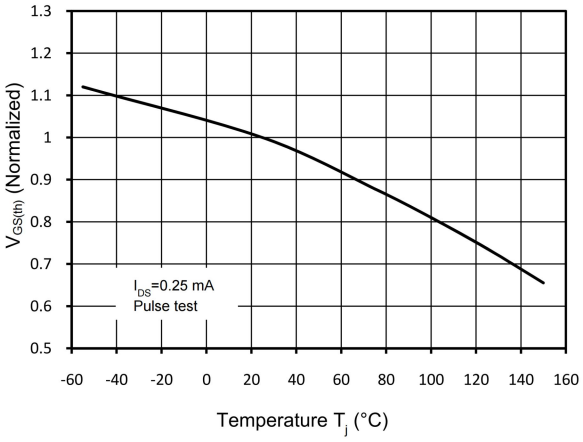


Figure 7. Threshold Voltage vs. Temperature

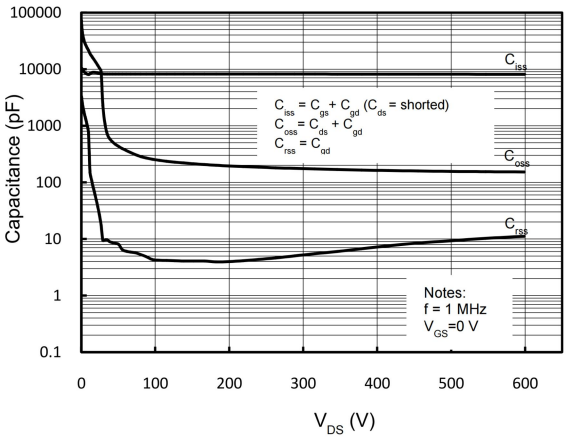


Figure 8. Capacitance Characteristics

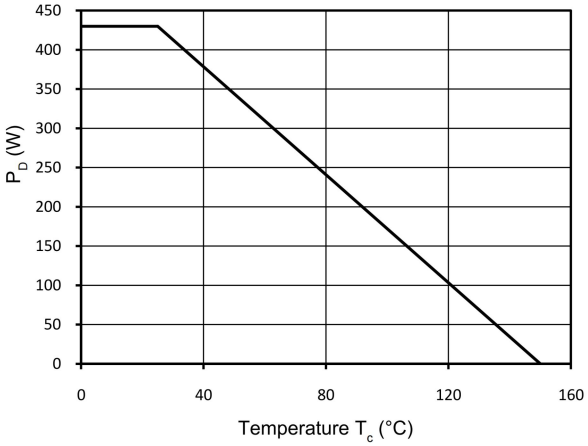


Figure 9. Power Dissipation

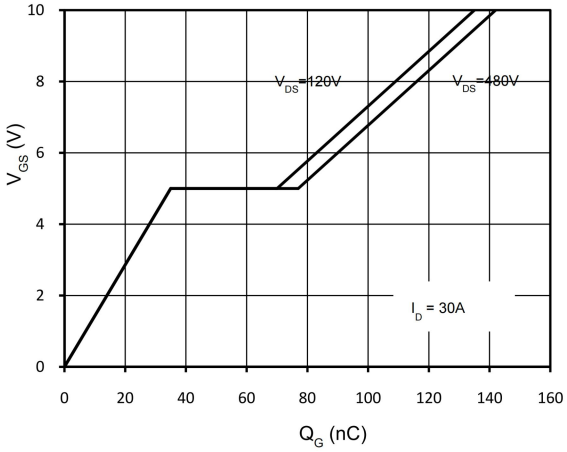


Figure 10. Gate Charge Characteristics

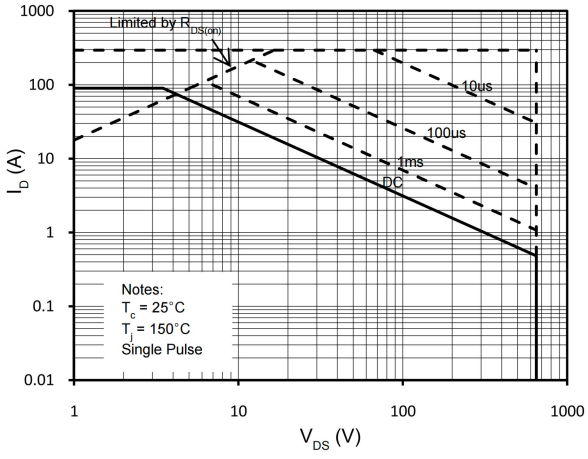


Figure 11. Maximum Safe Operating Area

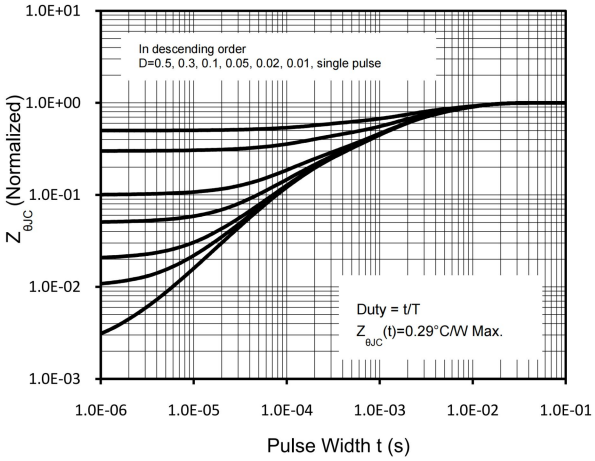
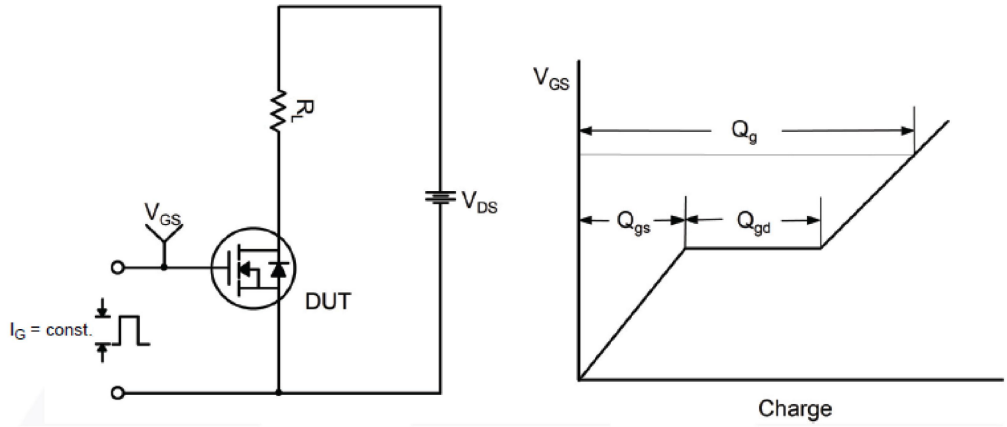


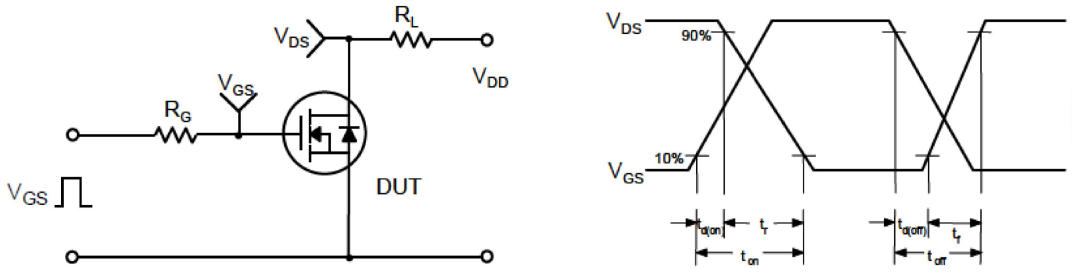
Figure 12. Transient Thermal Response Curve

Test Circuit

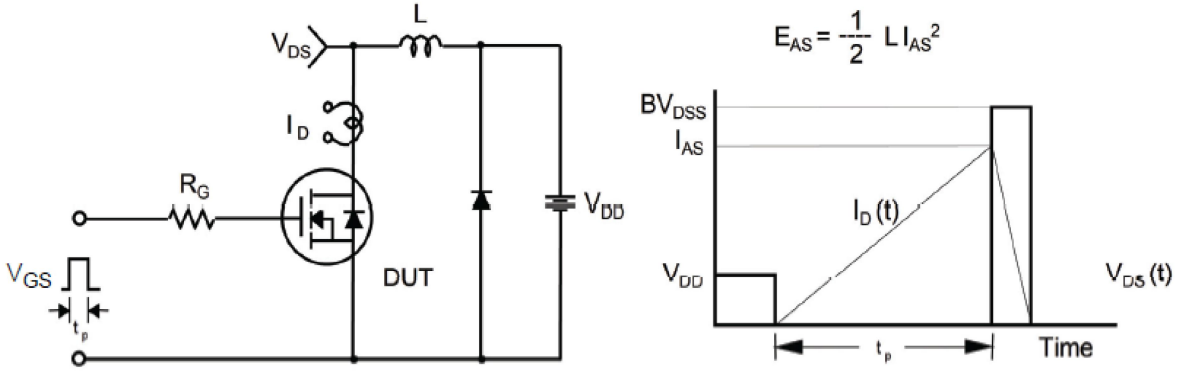
Gate Charge Test Circuit & Waveform



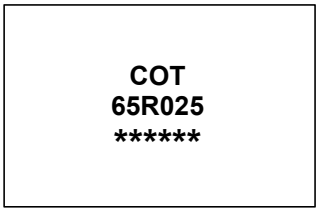
Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Marking codes



Note:

COT: Company Code

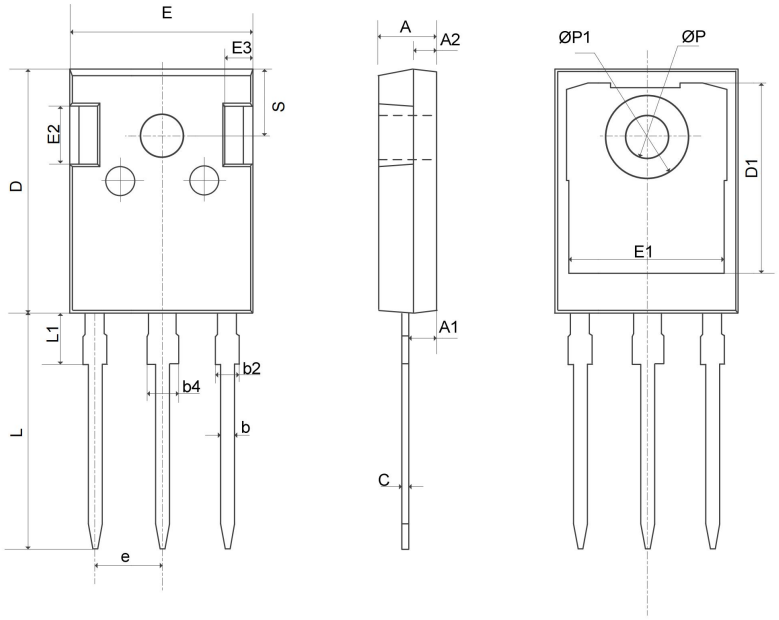
65R025: Product Type.

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

Ordering Information

Part	Package	Marking	Packing method
CT65R025HA	TO-247	65R025	Tube

Mechanical Dimensions for TO-247



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	4.80	5.21
A1	2.21	2.61
A2	1.85	2.16
b	1.07	1.36
b2	1.91	2.41
b4	2.87	3.38
c	0.51	0.75
D	20.70	21.30
D1	16.25	17.65
E	15.50	16.13
E1	12.38	13.60
E2	3.68	5.20
E3	1.00	2.70
e	5.44BSC	
L	19.62	20.32
L1	—	4.40
ØP	3.40	3.80
ØP1	—	7.30
S	6.15BSC	