

• General Description

It combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

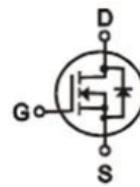
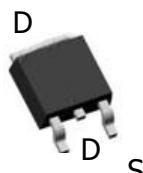
• Features

- Multi-Epi process SJ-FET
- Low RDS(ON) to minimize conduction loss
- Ultra Low Gate Charge
- 100% UIS and RG Tested

• Application

- SMPS 2nd Synchronous Rectifier
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

• Product Summary


 $V_{DS} = 500V$
 $R_{DS(ON)} = 800m\Omega$
 $I_D = 10A$


TO-252

• Ordering Information:

Part NO.	CH10N50D
Marking	CH10N50D
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

• Absolute Maximum Ratings ($T_c = 25^\circ C$)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current	$I_D @ T_c = 25^\circ C$	10	A
	$I_D @ T_c = 75^\circ C$	5.3	A
	$I_D @ T_c = 100^\circ C$	4.4	A
Pulsed Drain Current ^①	I_{DM}	28	A
Continuous Body Diode Current IS	I_S	7	A
Pulsed Diode Forward Current	I_{SM}	28	A
Total Power Dissipation	$P_D @ T_c = 25^\circ C$	80	W
Total Power Dissipation	$P_D @ T_a = 25^\circ C$	1.25	W
Operating Junction Temperature	T_J	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Single Pulse Avalanche Energy	E_{AS}	190	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R _{thJC}	-	-	1.56	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	65	° C/W
Soldering temperature, wavesoldering for 10s	T _{sold}	-	-	265	° C

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	500			V
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250uA	2.0	3.0	4.0	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V			1.0	uA
Gate- Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V			±100	nA
Static Drain-source On Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =4.0A		750	800	mΩ

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	DS=25V, V _{GS} =0, =1.0MHz	-	1012	-	pF
Output capacitance	C _{oss}		-	160	-	
Reverse transfer capacitance	C _{rss}		-	20	-	

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Gate Resistance	R _g	f = 1MHz V _{DS} =480V, I _D =3.5A, V _{GS} =10V		10		Ω
Total gate charge	Q _g		-	36	-	nC
Gate - Source charge	Q _{gs}		-	3.0	-	
Gate - Drain charge	Q _{gd}		-	12.5	-	
Turn-ON Delay time	t _{D(on)}	V _{DD} = 250V I _D = 10A R _G = 25Ω		60		nS
Turn-ON Rise time	t _r			21		
Turn-Off Delay time	t _{D(off)}			40		
Turn-Off Fall time	t _f			32		
Body Diode Reverse Recovery Time	t _{rr}	V _R = 400V I _F = I _S		300		nS

Body Diode Reverse Recovery Charge	Q_{rr}	$dI_f/dt = 100A/\mu s$		1.4		nC
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Diode Characteristics

Source-drain voltage	V_{SD}	$V_{GS}=0V, I_s=7A$		1.45	V
Body Diode Reverse Recovery Time	t_{rr}	$V_R=400V, I_F=3.5A,$ $di/dt=100A/us$	300		nS
Body Diode Reverse Recovery Charge	Q_{rr}		2.2		nC

Typical Characteristics

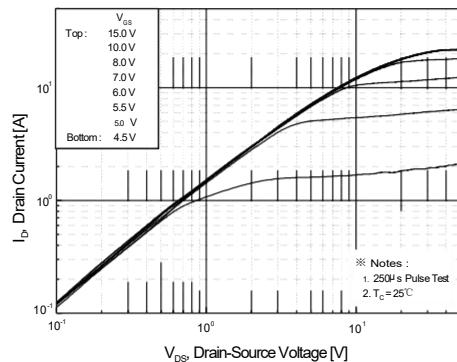


Figure 1. On-Region Characteristics

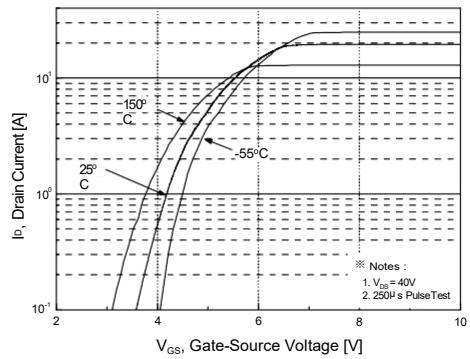


Figure 2. Transfer Characteristics

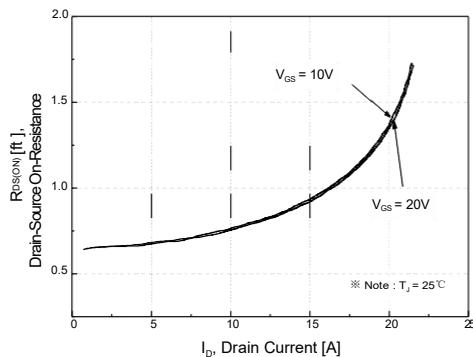


Figure 3. On-Resistance Variation vs
Drain Current and Gate Voltage

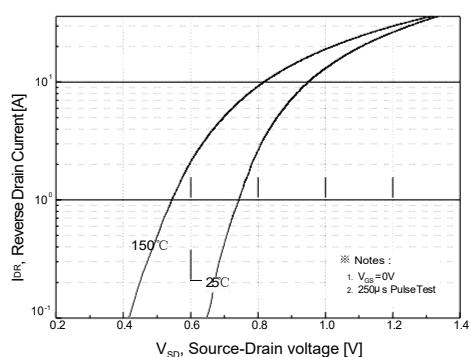


Figure 4. Body Diode Forward Voltage
Variation with Source Current
and Temperature

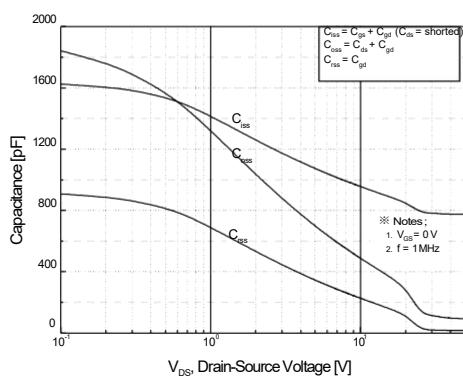


Figure 5. Capacitance Characteristics

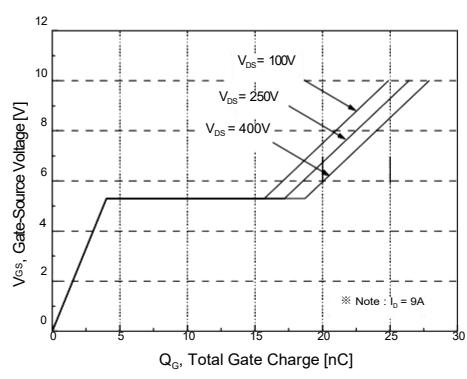


Figure 6. Gate Charge Characteristics

Typical Characteristics (Continued)

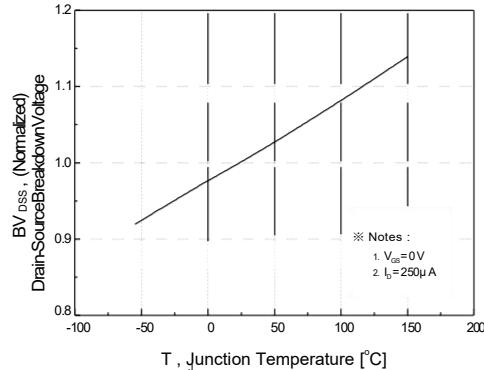


Figure 7. Breakdown Voltage Variation vs Temperature

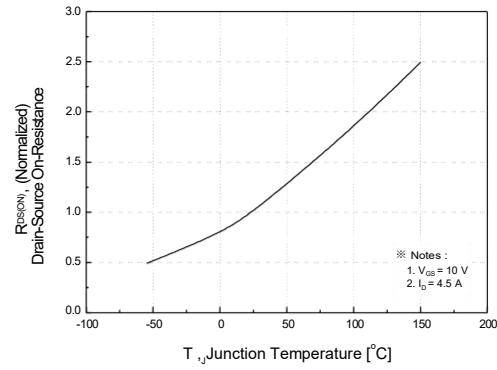


Figure 8. On-Resistance Variation vs Temperature

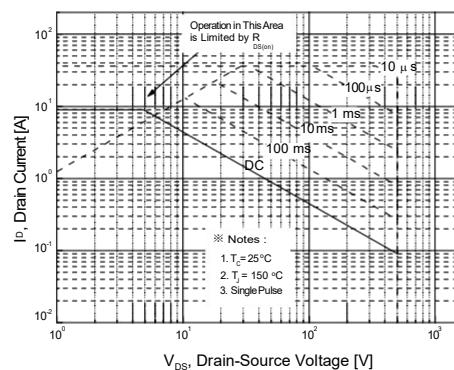


Figure 9-2. Maximum Safe Operating Area

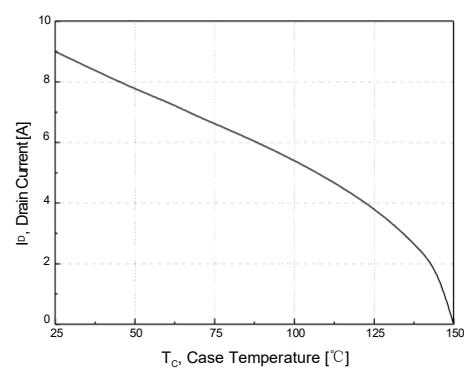


Figure 10. Maximum Drain Current vs Case Temperature

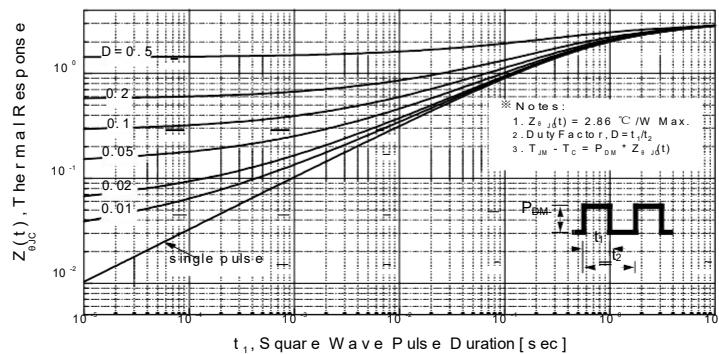
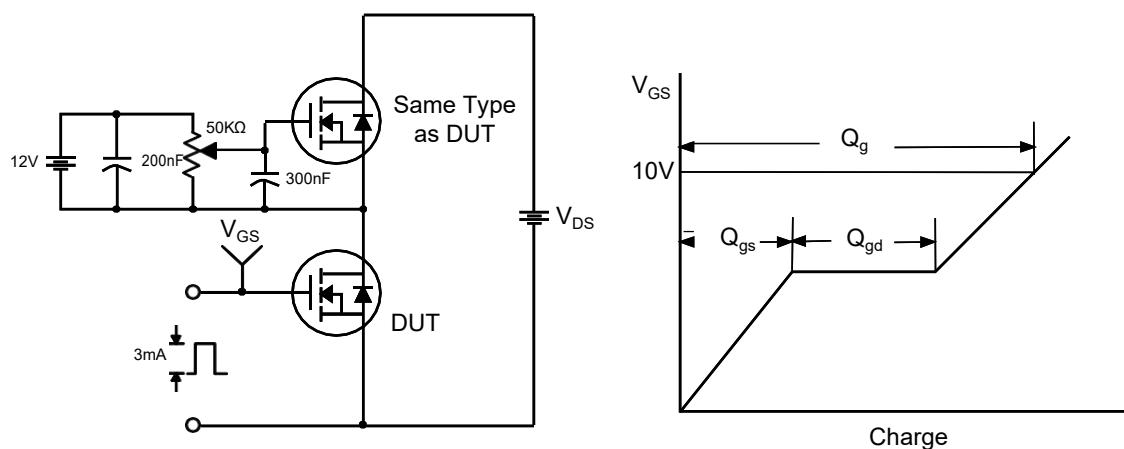
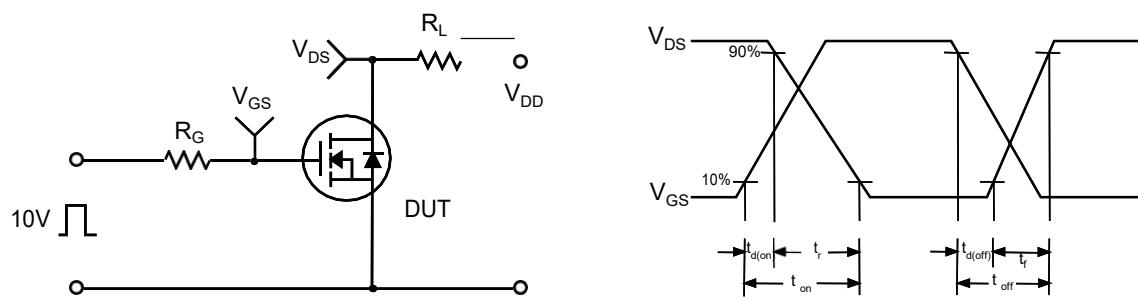


Figure 11-2. Transient Thermal Response Curve

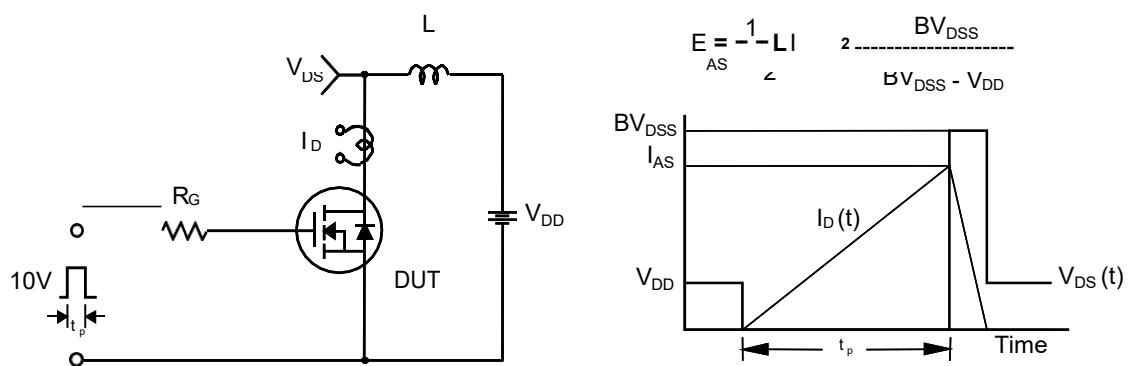
Gate Charge Test Circuit & Waveform

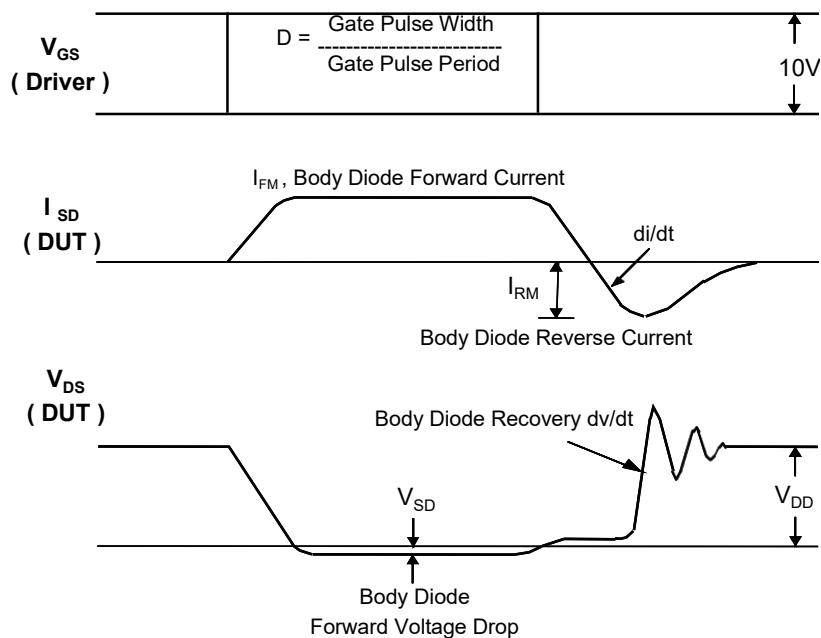
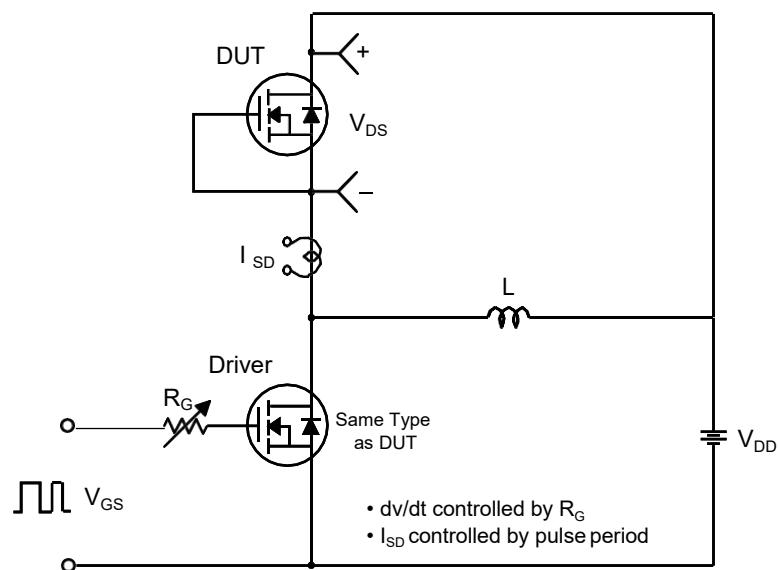


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms


•Dimensions (TO-252)

Unit: mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	b1	0.50	0.90
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			

