



Description

The CMD5950 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

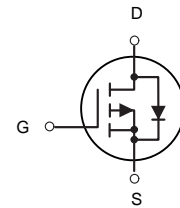


TO-252-2L

General Features

$V_{DS} = -100V$ $I_D = -30A$

$R_{DS(ON)} < 57.5\ m\Omega @ V_{GS} = -10V$



P-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
CMD5950	TO-252-2L	5950 XXXX	2500

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-100	V
V _{GS}	Gate-Source Voltage	±20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	-30	A
I _{DM}	Pulsed Drain Current ²	-120	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ⁴	107	W
E _{AS}	Avalanche energy (Note 2)	361	mJ
T _{STG}	Storage Temperature Range	-55 to 175	°C
T _J	Operating Junction Temperature Range	-55 to 175	°C
R _{θJC}	Thermal Resistance Junction-Case ¹	1.4	°C/W



Electrical Characteristics (T = 25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =-250μA	-100	-127		V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-100V, V _{GS} =0V			-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.8	-2.5	V
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-15A		50		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-15A		46	57.5	mΩ
		V _{GS} =-4.5V, I _D =-10A		48	63	mΩ
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, f=1.0MHz		8056		pF
C _{oss}	Output Capacitance			195		pF
C _{rss}	Reverse Transfer Capacitance			70		pF
t _{d(on)}	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-50V, R _L =3.3Ω, R _{GEN} =9.1Ω		13		nS
t _r	Turn-on Rise Time			64		nS
t _{d(off)}	Turn-Off Delay Time			36		nS
t _f	Turn-Off Fall Time			52		nS
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-50V, I _D =-10A		147		nC
Q _{gs}	Gate-Source Charge			17		nC
Q _{gd}	Gate-Drain Charge			31		nC
I _{SD}	Source-Drain Current (Body Diode)				-30	A
V _{SD}	Forward on Voltage ^(Note 3)	V _{GS} =0V, I _S =-15A			-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-15A, di/dt=100A/μs		72		ns
Q _{rr}	Reverse Recovery Charge	I _F =-15A, di/dt=100A/μs		120		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.EAS condition: T_J=25°C, V_{DD}=50V, V_G=-10V, R_g=25Ω, L=0.5mH.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.



Typical Characteristics

Figure 1. Output Characteristics

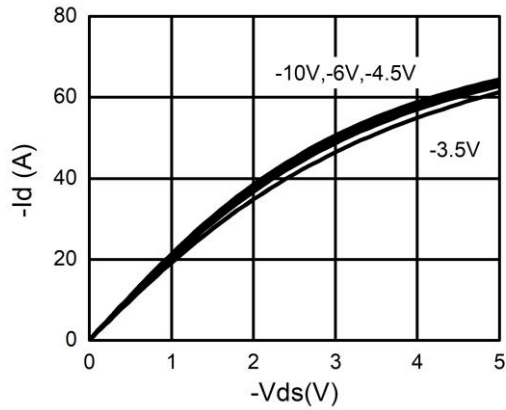


Figure 2. Transfer Characteristics

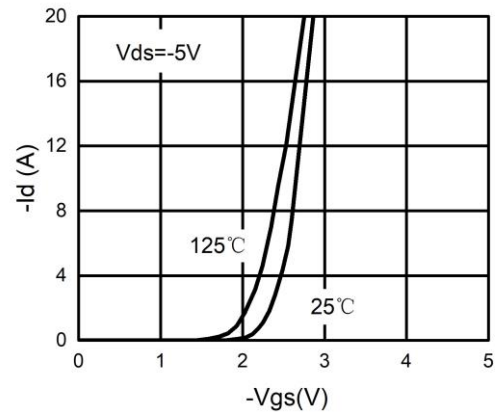


Figure 3. Power Dissipation

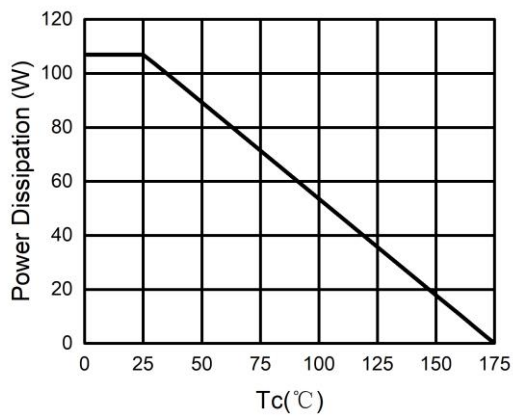


Figure 4. Drain Current

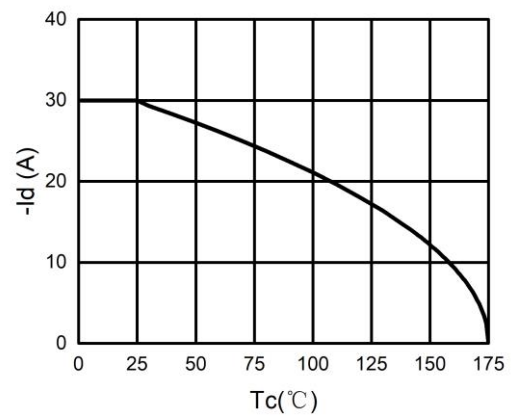


Figure 5. BV_{DSS} vs Junction Temperature

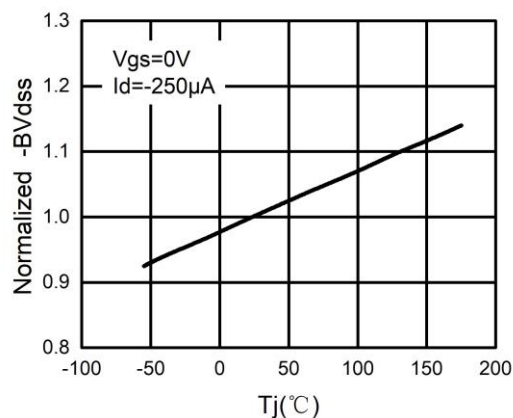


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

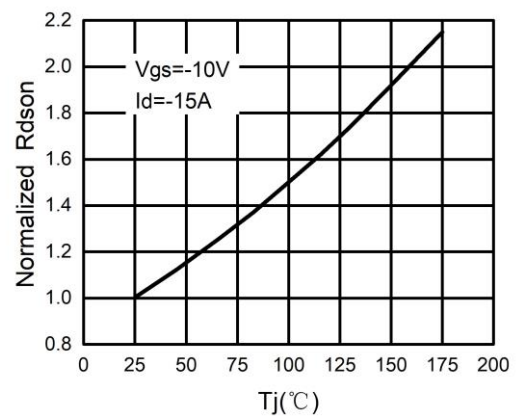




Figure 7. Gate Charge Waveforms

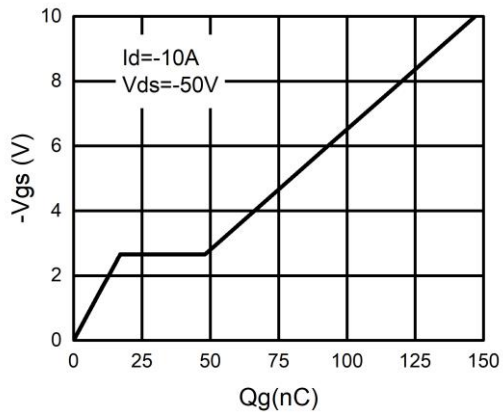


Figure 8. Capacitance

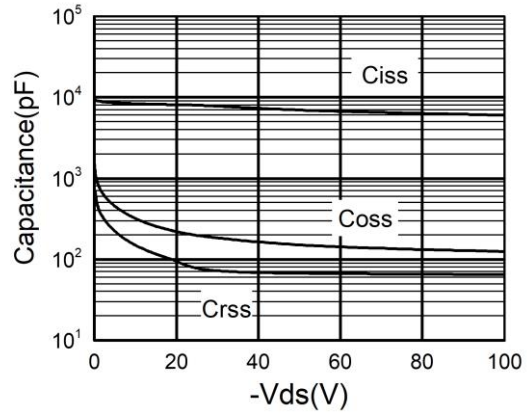


Figure 9. Body-Diode Characteristics

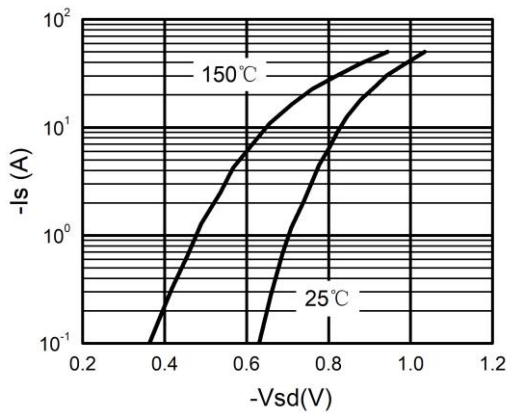
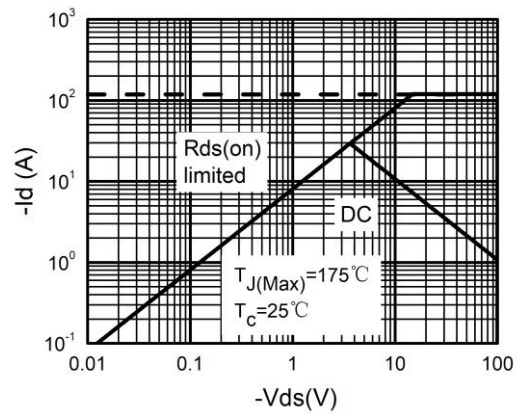


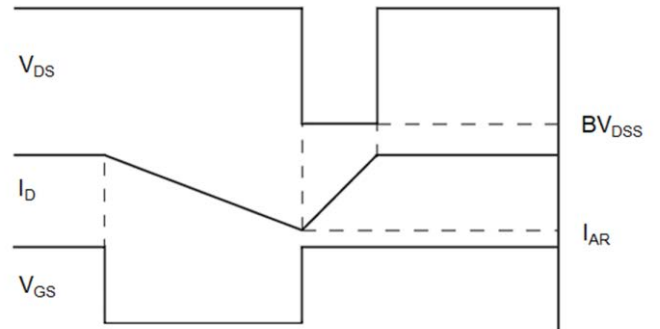
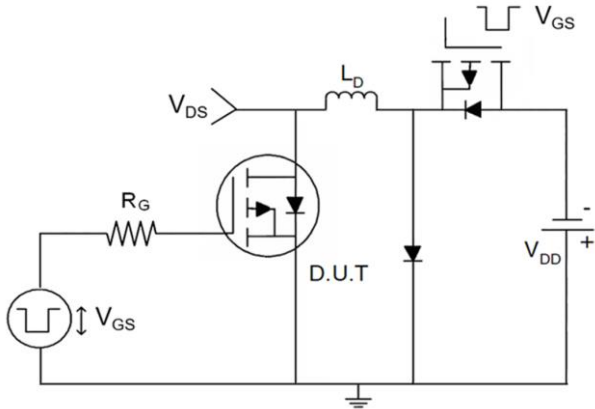
Figure 10. Maximum Safe Operating Area



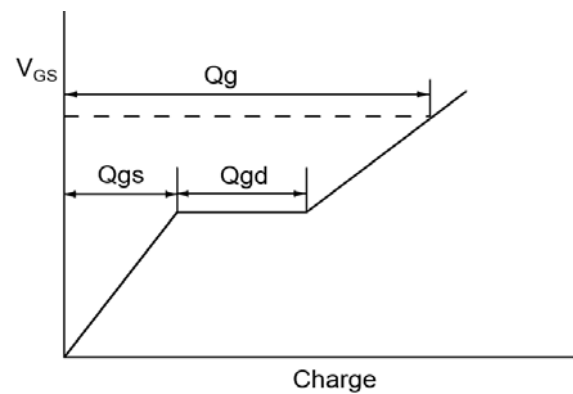
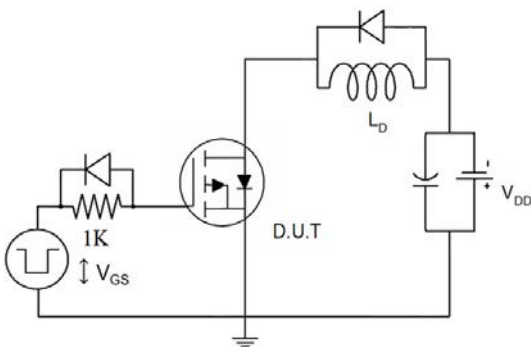


Test Circuit

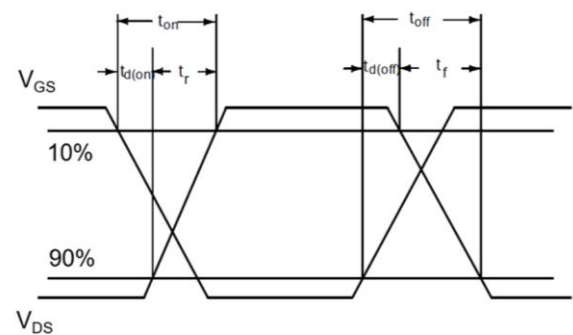
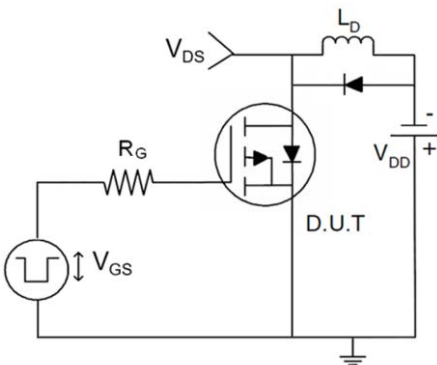
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit

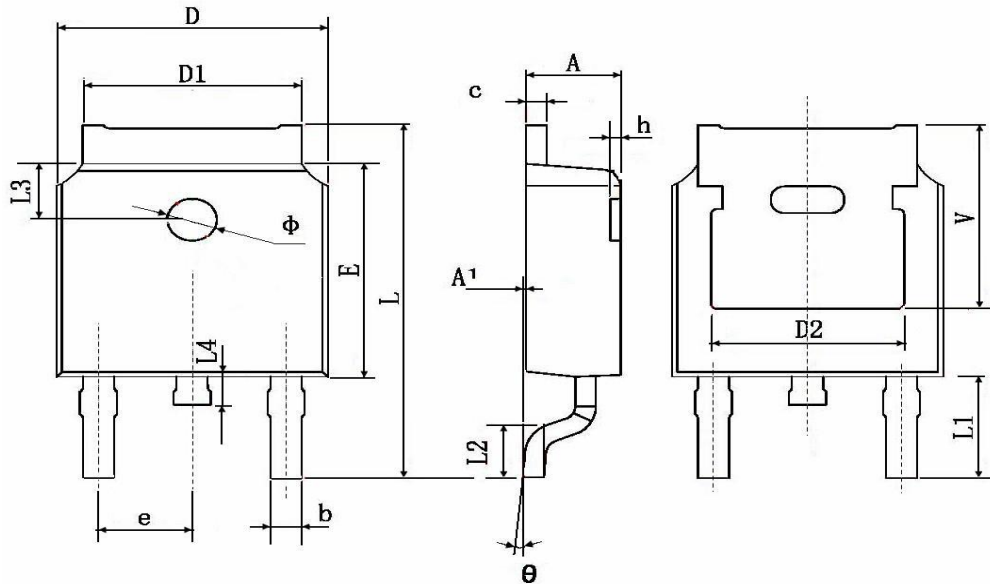


3) Switch Time Test Circuit





TO-252-2L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	



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