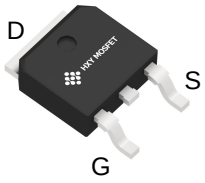
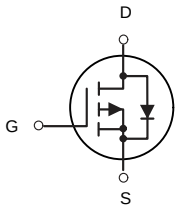
Description

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 (DPAK)



P-Channel MOSFET

General Features

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

$R_{DS(ON)}$ < 57.5 mΩ@ V_{GS}=-10V

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

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

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-100	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	-30	A
IDM	Pulsed Drain Current[2]	-120	A
P_D@T_C=25℃	Total Power Dissipation[4]	107	W
E_{AS}	Avalanche energy (Note 2)	361	mJ
TSTG	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃
R_{θ}JC	Thermal Resistance Junction-Case[1]	1.4	℃/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.E_{AS} condition: T_J=25℃,V_{DD}=50V,V_G=-10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Characteristics

Figure 1. Output Characteristics

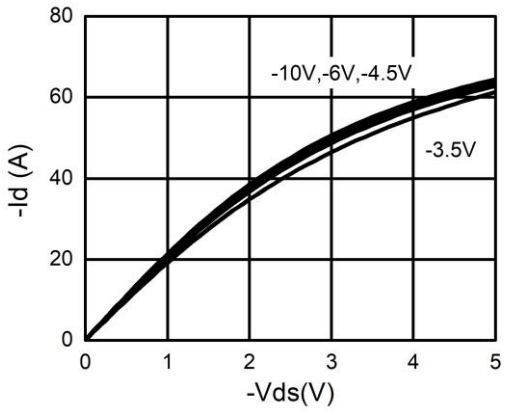


Figure 2. Transfer Characteristics

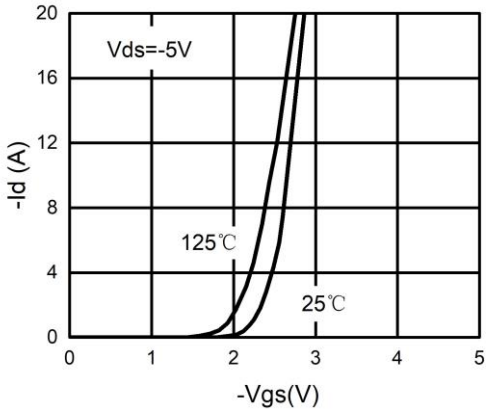


Figure 3. Power Dissipation

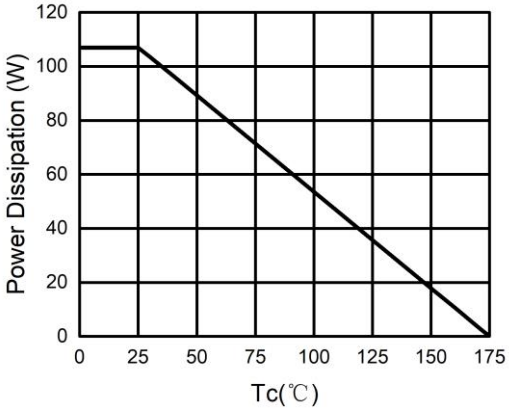


Figure 4. Drain Current

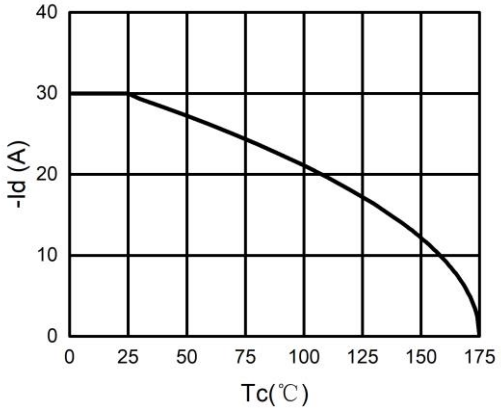


Figure 5. BV_{DSS} vs Junction Temperature

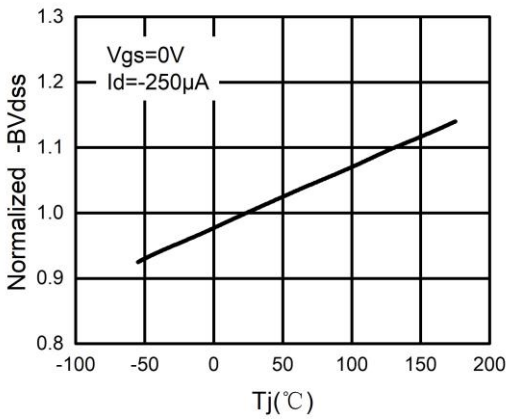


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

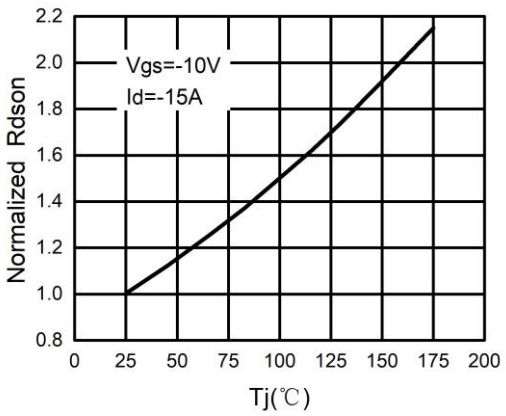


Figure 7. Gate Charge Waveforms

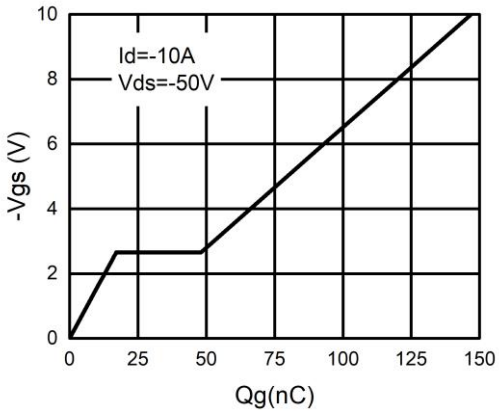


Figure 8. Capacitance

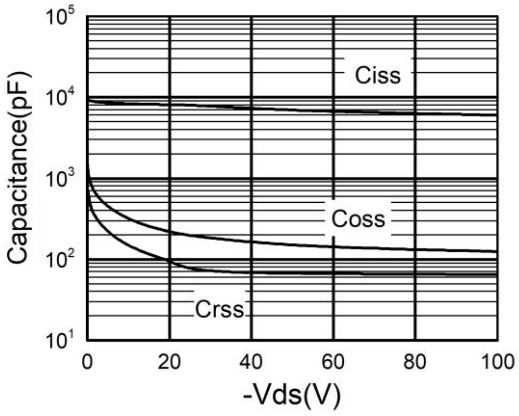


Figure 9. Body-Diode Characteristics

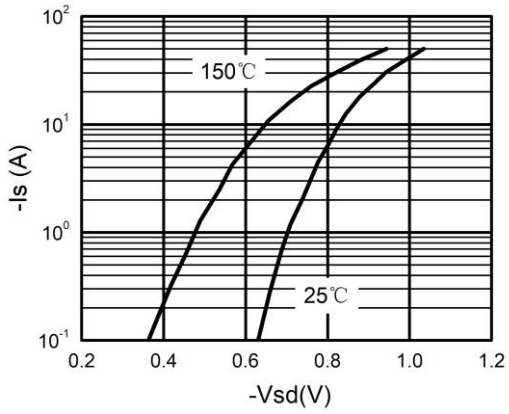
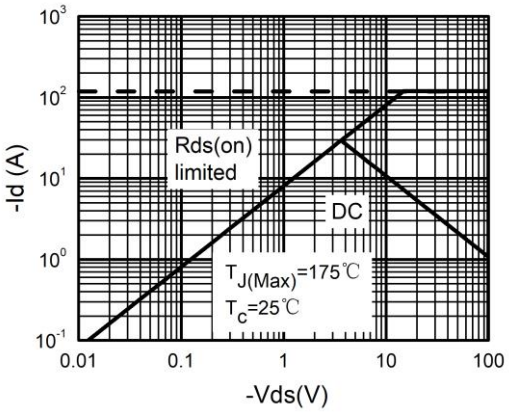
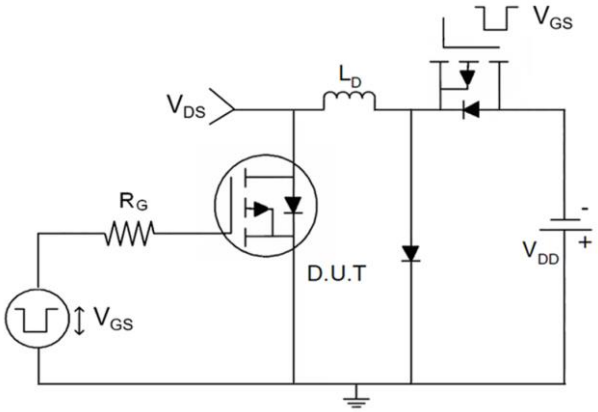


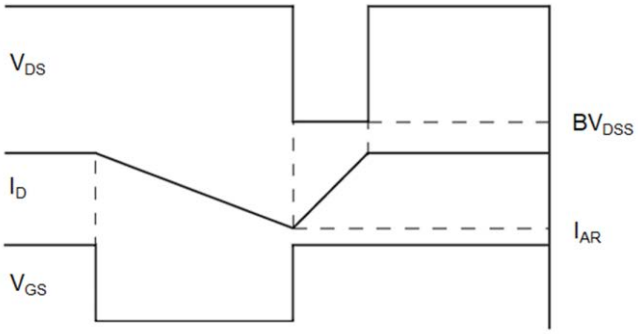
Figure 10. Maximum Safe Operating Area



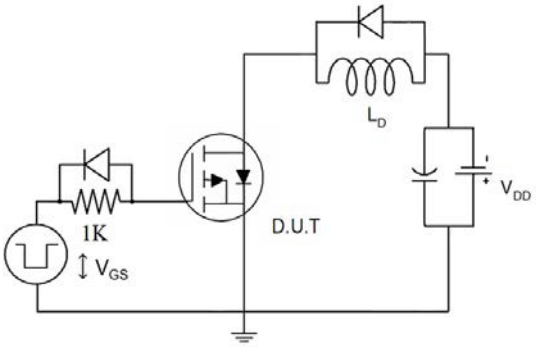
Test Circuit

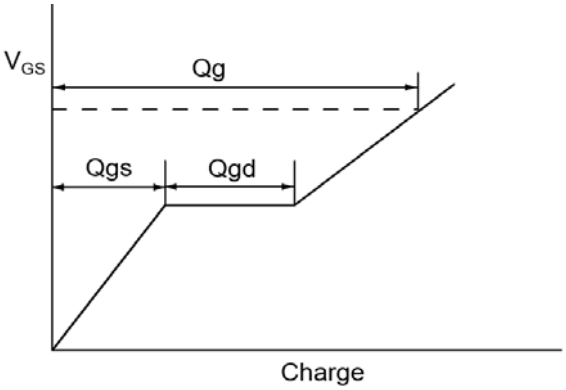
1) E_{AS} Test Circuits



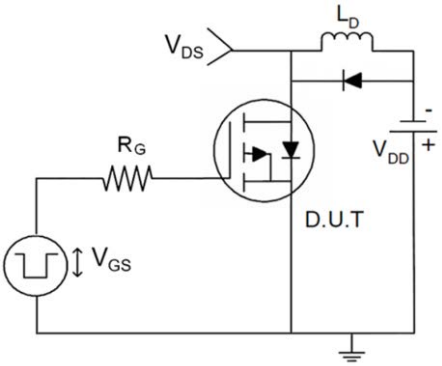


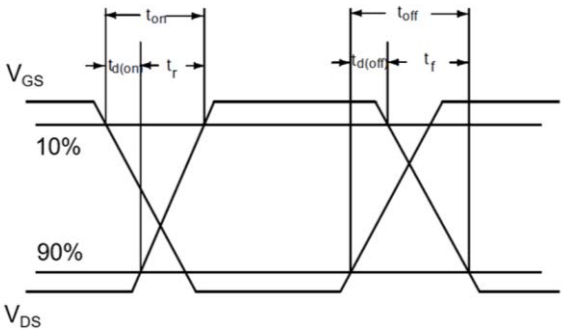
2) Gate Charge Test Circuit



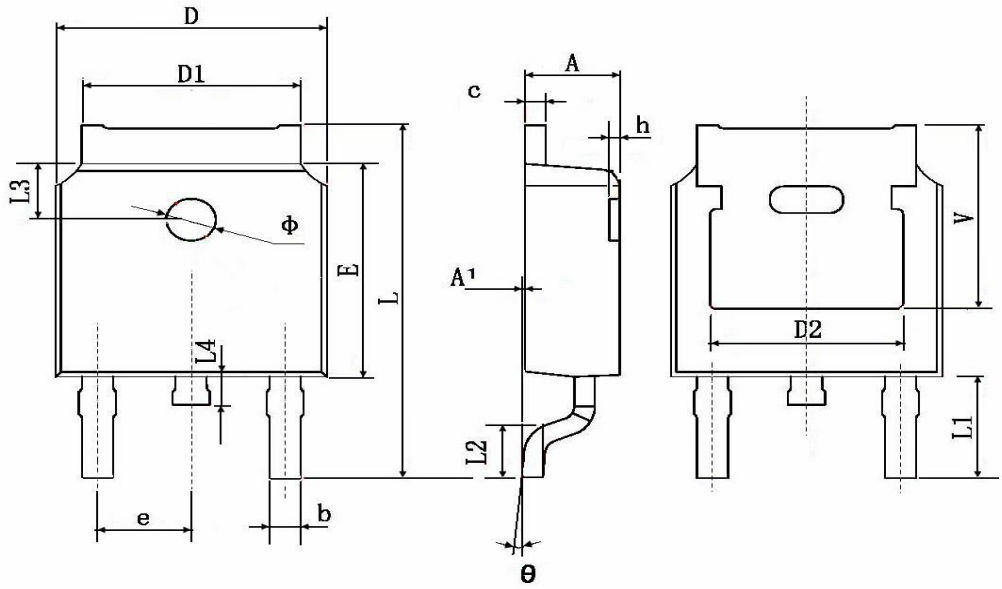


3) Switch Time Test Circuit





TO-252-2L(DPAK) 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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