CEM9925

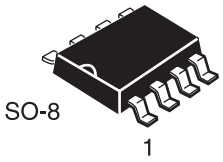
March 1998

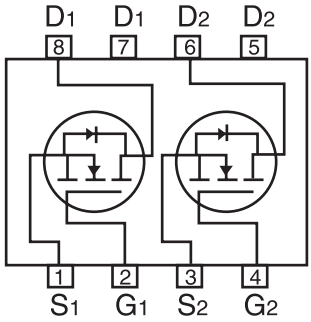
Dual N-Channel Enhancement Mode Field Effect Transistor

5

FEATURES

- 20V , 5A , $R_{DS(ON)}$=45mΩ @V_{GS}=4.5V.
  $R_{DS(ON)}$=60mΩ @V_{GS}=2.5V.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handing capability.
- Surface Mount Package.





ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±8	V
Drain Current-Continuous[a] @T_J=125°C	I_D	±5.0	A
-Pulsed[b]	I_{DM}	±48	A
Drain-Source Diode Forward Current[a]	I_S	1.7	A
Maximum Power Dissipation[a]	P_D	2	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient[a]	$R_{\theta JA}$	62.5	°C/W

CEM9925

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=10V, V_{GS}=0V			1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS[b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.5	0.68	1	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D= 5.0A		29	45	mΩ
		V_{GS}=2.5V, I_D= 1.0A		35	60	mΩ
On-State Drain Current	$I_{D(ON)}$	V_{DS}= 5V, V_{GS}= 5V	10			A
Forward Transconductance	g_{FS}	V_{DS}= 10V, I_D=5.0A	7	15		S
DYNAMIC CHARACTERISTICS[c]						
Input Capacitance	C_{ISS}	V_{DS}=10V, V_{GS}= 0V f =1.0MHz		754	980	pF
Output Capacitance	C_{OSS}			273	360	pF
Reverse Transfer Capacitance	C_{RSS}			81	120	pF
SWITCHING CHARACTERISTICS[c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = 6V, I_D = 1A, V_{GEN} = 4.5V, R_L = 6Ω R_{GEN} = 6Ω		10	40	ns
Rise Time	t_r			12	30	ns
Turn-Off Delay Time	$t_{D(OFF)}$			21	60	ns
Fall Time	t_f			10	30	ns
Total Gate Charge	Q_g	V_{DS} =6V, I_D = 5.0A, V_{GS} =4.5V		9	20	nC
Gate-Source Charge	Q_{gs}			2		nC
Gate-Drain Charge	Q_{gd}			3		nC

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ [c]	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is =5.0A		0.8	1.2	V

Notes

a.Surface Mounted on FR4 Board, t ≤10sec.

b.Pulse Test:Pulse Width ≤300 μs, Duty Cycle ≤2%.

c.Guaranteed by design, not subject to production testing.

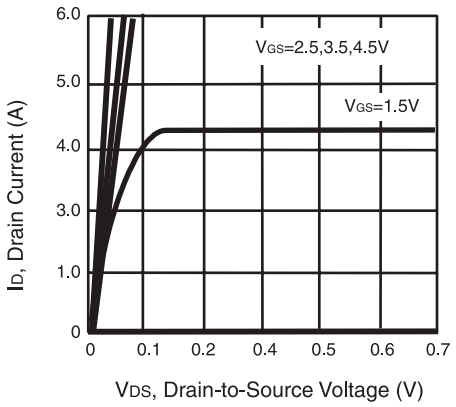


Figure 1. Output Characteristics

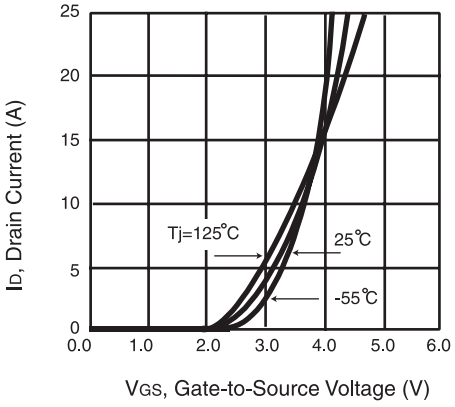


Figure 2. Transfer Characteristics

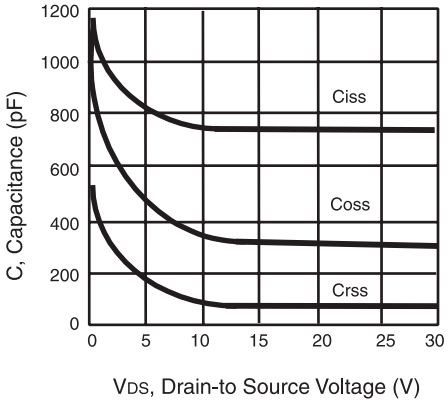


Figure 3. Capacitance

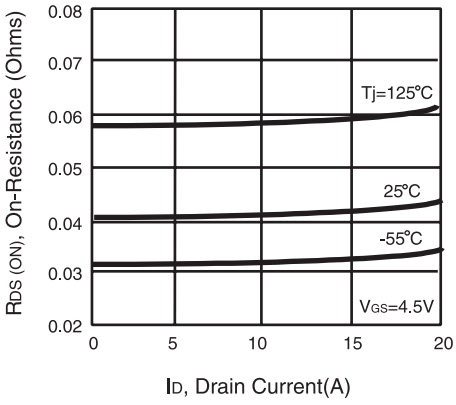


Figure 4. On-Resistance Variation with Drain Current and Temperature

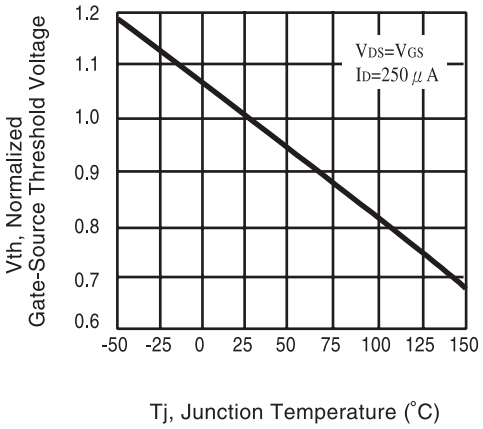


Figure 5. Gate Threshold Variation with Temperature

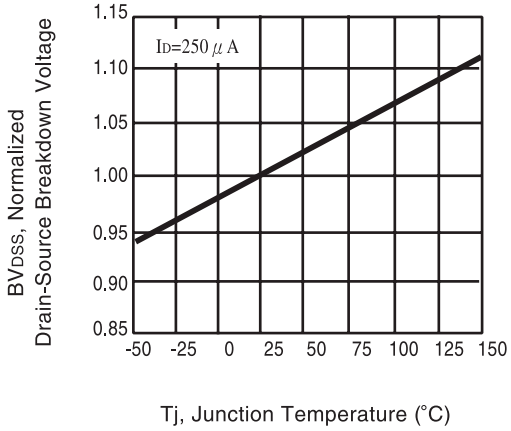


Figure 6. Breakdown Voltage Variation with Temperature

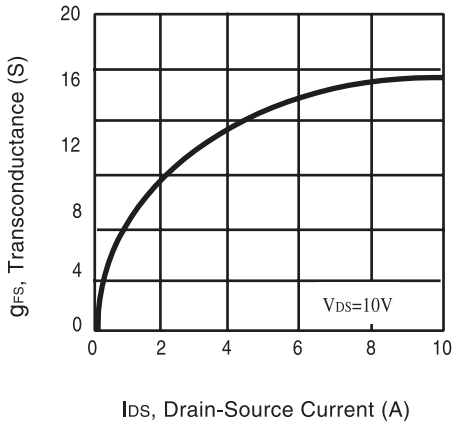


Figure 7. Transconductance Variation with Drain Current

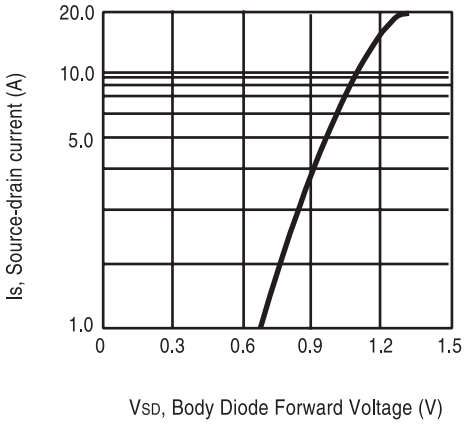


Figure 8. Body Diode Forward Voltage Variation with Source Current

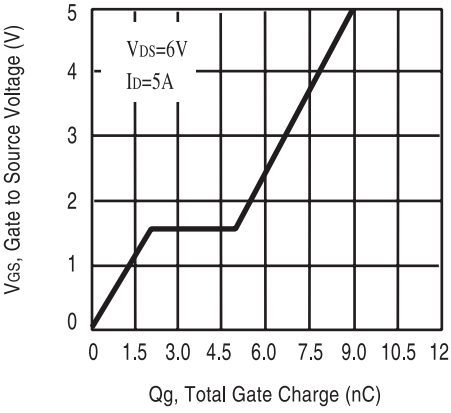


Figure 9. Gate Charge

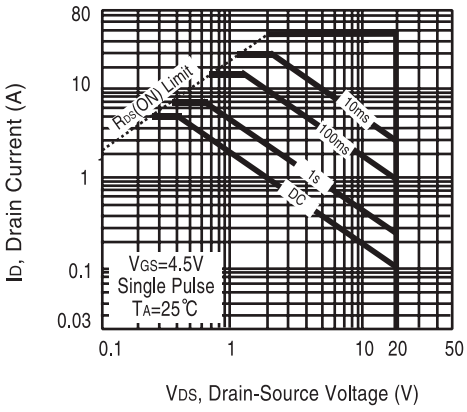


Figure 10. Maximum Safe Operating Area

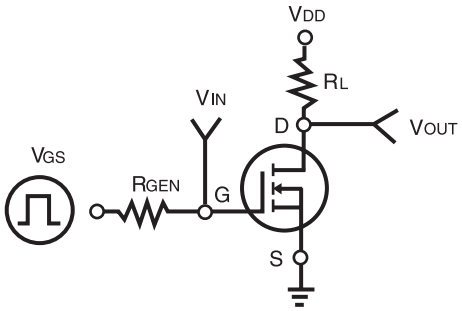


Figure 11. Switching Test Circuit

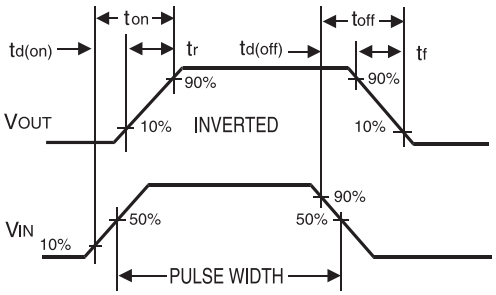


Figure 12. Switching Waveforms

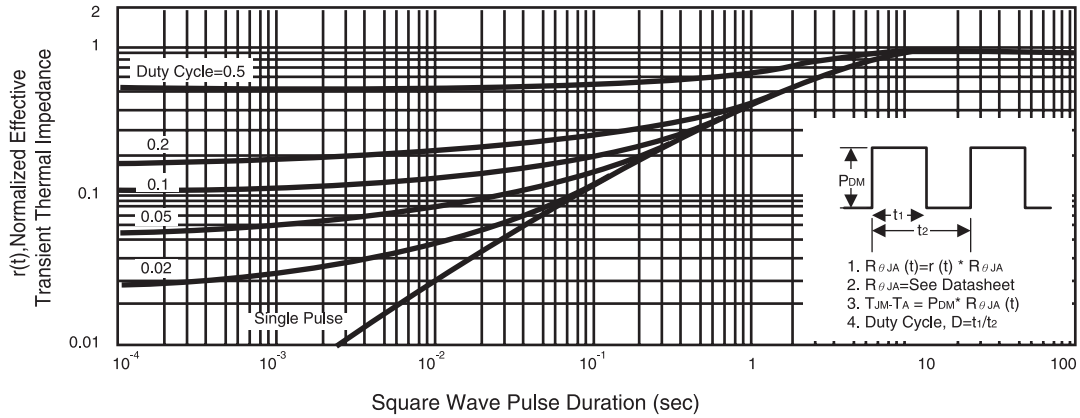


Figure 13. Normalized Thermal Transient Impedance Curve