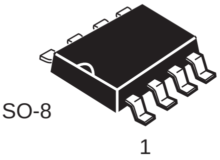
CEM2281

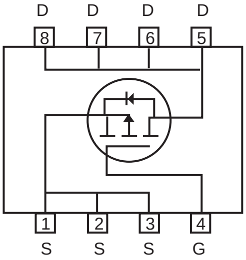
P-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

FEATURES

- -20V, -7.2A, $R_{DS(ON)}$ = 30mΩ @V_{GS} = -4.5V.
  $R_{DS(ON)}$ = 43mΩ @V_{GS} = -2.5V.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handing capability.
- Lead free product is acquired.
- Surface mount Package.





ABSOLUTE MAXIMUM RATINGS $T_A = 25^{\circ}C$ unless otherwise noted

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	-7.2	A
Drain Current-Pulsed [a]	I_{DM}	-30	A
Maximum Power Dissipation	P_D	2.5	W
Operating and Store Temperature Range	T_J,T_{stg}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Ambient [b]	$R_{\theta JA}$	50	°C/W

This is preliminary information on a new product in development now .
Details are subject to change without notice .

Rev 1. 2006.July

P-Channel Electrical Characteristics $T_A = 25^{\circ}C$ unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
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} = -20V, V_{GS} = 0V			-1	µA
Gate Body Leakage Current, Forward	I_{GSSF}	V_{GS} = 12V, V_{DS} = 0V			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	V_{GS} = -12V, V_{DS} = 0V			-100	nA
On Characteristics [c]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = -250µA	-0.5		-1.3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -7.2A		25	30	mΩ
		V_{GS} = -2.5V, I_D = -5.7A		33	43	mΩ
Dynamic Characteristics [d]						
Forward Transconductance	g_{FS}	V_{DS} = -1.8V, I_D = -7.2A		41		S
Input Capacitance	C_{iss}	V_{DS} = -15V, V_{GS} = 0V, f = 1.0 MHz		2035		pF
Output Capacitance	C_{oss}			295		pF
Reverse Transfer Capacitance	C_{rss}			200		pF
Switching Characteristics [d]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -10V, I_D = -1A, V_{GS} = -4.5V, R_{GEN} = 24Ω		11	22	ns
Turn-On Rise Time	t_r			10	20	ns
Turn-Off Delay Time	$t_{d(off)}$			356	712	ns
Turn-Off Fall Time	t_f			110	220	ns
Total Gate Charge	Q_g	V_{DS} = -16V, I_D = -4.7A, V_{GS} = -4.5V		19	25	nC
Gate-Source Charge	Q_{gs}			4.3		nC
Gate-Drain Charge	Q_{gd}			2.6		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current [b]	I_S				-7.2	A
Drain-Source Diode Forward Voltage [c]	V_{SD}	V_{GS} = 0V, I_S = -2.1A			-1.2	V

Notes :
a.Repetitive Rating : Pulse width limited by maximum junction temperature.
b.Surface Mounted on FR4 Board, t ≤ 10 sec.
c.Pulse Test : Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.
d.Guaranteed by design, not subject to production testing.

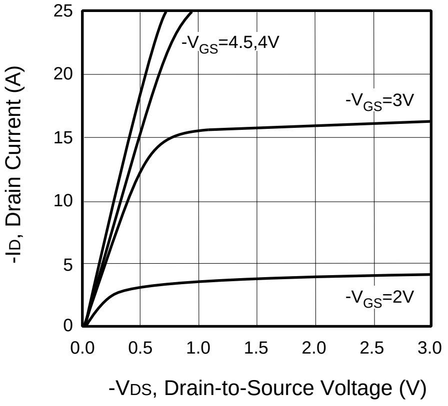


Figure 1. Output Characteristics

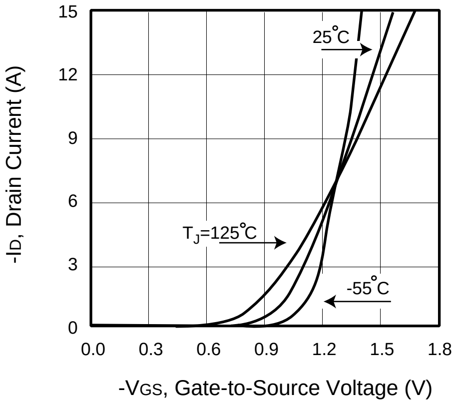


Figure 2. Transfer Characteristics

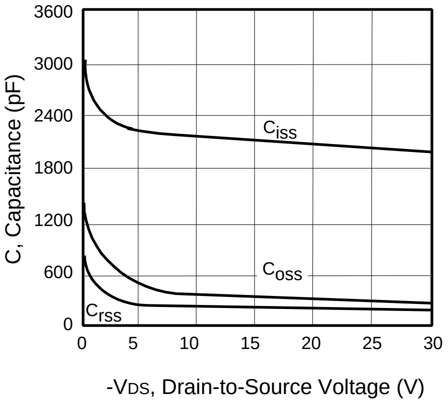


Figure 3. Capacitance

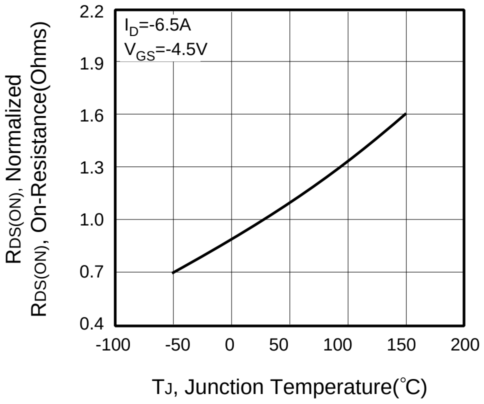


Figure 4. On-Resistance Variation with Temperature

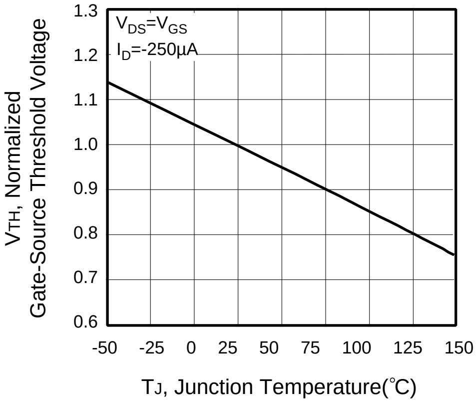


Figure 5. Gate Threshold Variation with Temperature

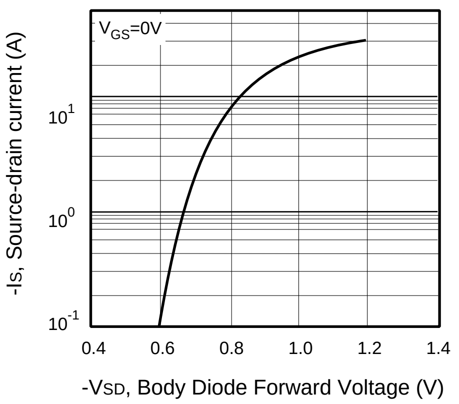


Figure 6. Body Diode Forward Voltage Variation with Source Current

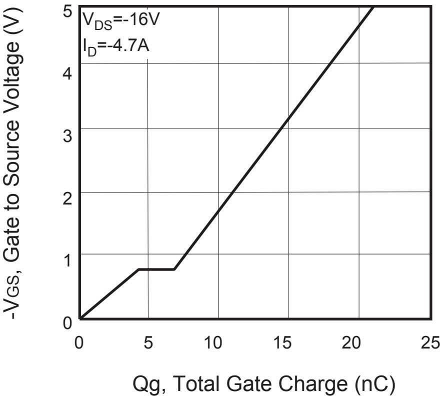


Figure 7. Gate Charge

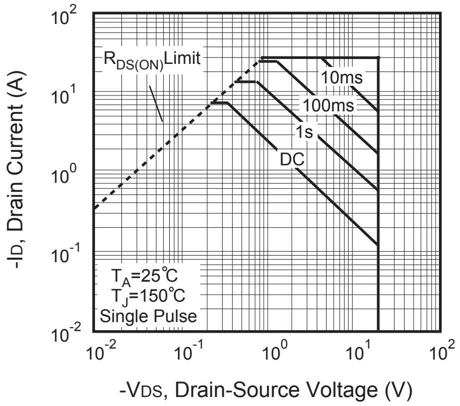


Figure 8. Maximum Safe Operating Area

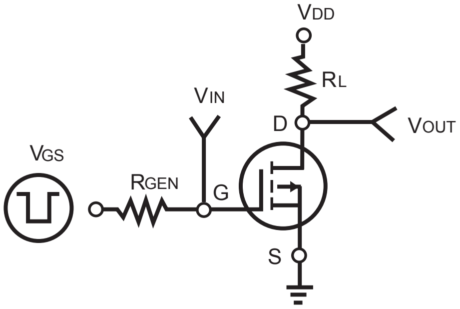


Figure 9. Switching Test Circuit

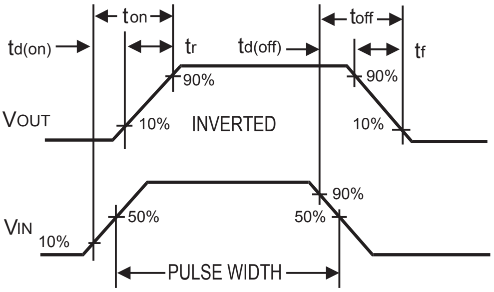


Figure 10. Switching Waveforms

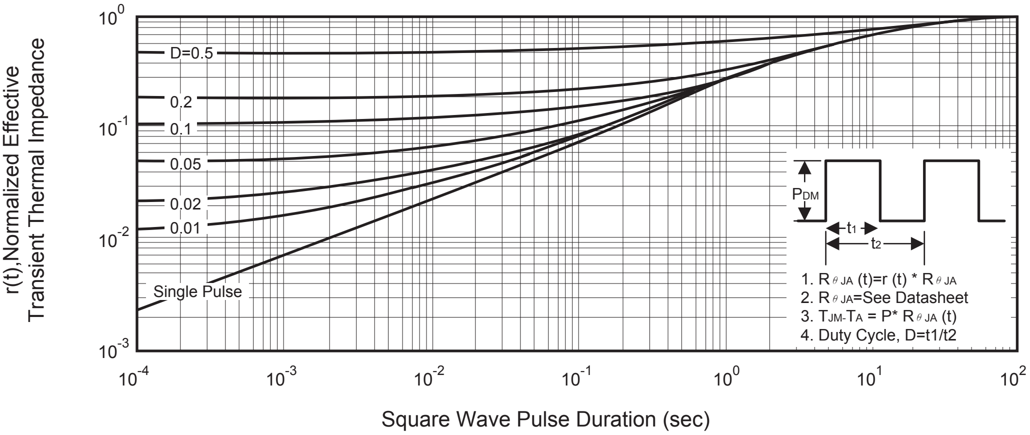


Figure 11. Normalized Thermal Transient Impedance Curve