CEM3252

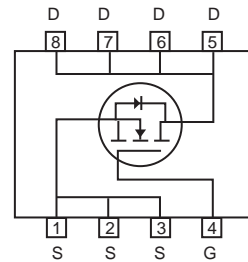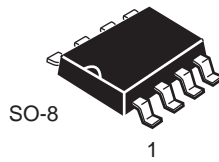## N-Channel Enhancement Mode Field Effect Transistor

FEATURES

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■ 30V, 7.5A, $R_{DS(ON)}$ = 28mΩ @V_{GS} = 10V.

  $R_{DS(ON)}$ = 40mΩ @V_{GS} = 4.5V.

■ 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.

SO-8

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ABSOLUTE MAXIMUM RATINGS T_A = 25°C unless otherwise noted

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	7.5	A
Drain Current-Pulsed [a]	I_{DM}	25	A
Maximum Power Dissipation	P_D	2.5	W
Operating and Store Temperature Range	T_J,T_{stg}	-55 to 150	$^\circ$C

Thermal Characteristics

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

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Electrical Characteristics $T_A = 25°C$ unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V$, $V_{GS} = 0V$			1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 20V$, $V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -20V$, $V_{DS} = 0V$			-100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}$, $I_D = 250\mu A$	1.0		3.0	V
Static Drain-Source	$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 7A$		22	28	$m\Omega$
On-Resistance		$V_{GS} = 4.5V$, $I_D = 3.5A$		30	40	$m\Omega$
Dynamic Characteristics [d]						
Forward Transconductance	g_{FS}	$V_{DS} = 15V$, $I_D = 7A$		4		S
Input Capacitance	C_{iss}	$V_{DS} = 15V$, $V_{GS} = 0V$, f = 1.0 MHz		610		pF
Output Capacitance	C_{oss}			145		pF
Reverse Transfer Capacitance	C_{rss}			95		pF
Switching Characteristics [d]						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V$, $I_D = 7A$, $V_{GS} = 10V$, $R_{GEN} = 3\Omega$		9	20	ns
Turn-On Rise Time	t_r			3	8	ns
Turn-Off Delay Time	$t_{d(off)}$			24	50	ns
Turn-Off Fall Time	t_f			4	10	ns
Total Gate Charge	Q_g	$V_{DS} = 15V$, $I_D = 7A$, $V_{GS} = 10V$		12.3	16	nC
Gate-Source Charge	Q_{gs}			1.5		nC
Gate-Drain Charge	Q_{gd}			2.5		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current [b]	I_S				2.3	A
Drain-Source Diode Forward Voltage [c]	V_{SD}	$V_{GS} = 0V$, $I_S = 2.3A$			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%.
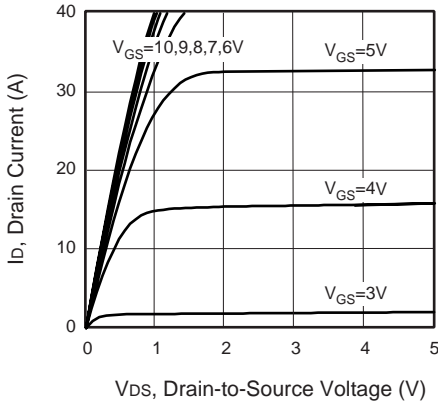d.Guaranteed by design, not subject to production testing.
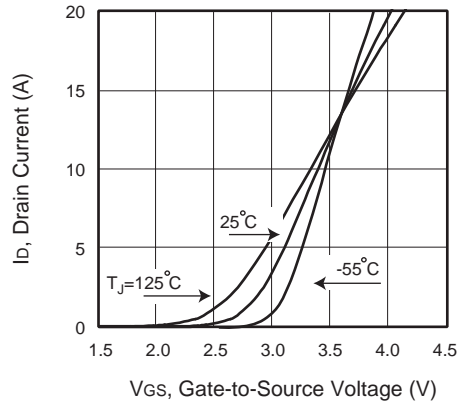
Figure 1. Output Characteristics

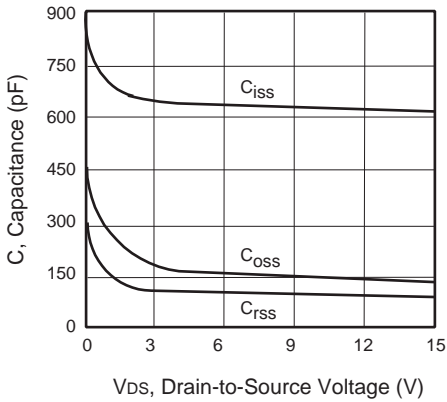**Figure 2. Transfer Characteristics**

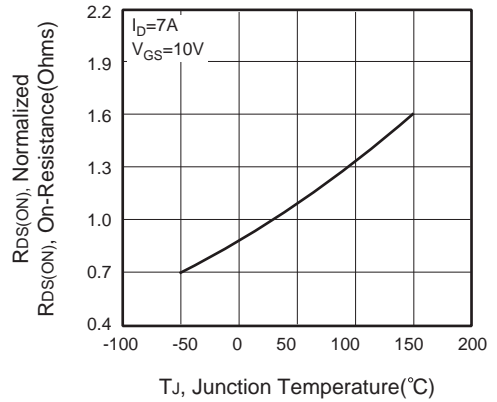

Figure 3. Capacitance

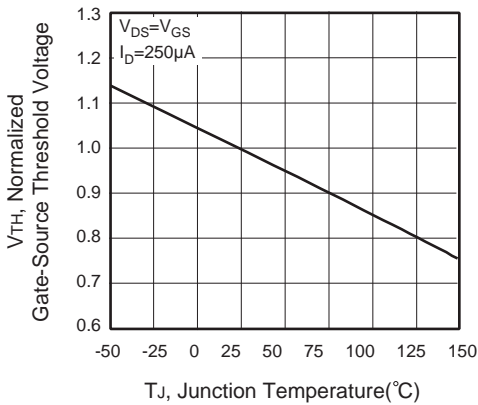**Figure 4. On-Resistance Variation with Temperature**

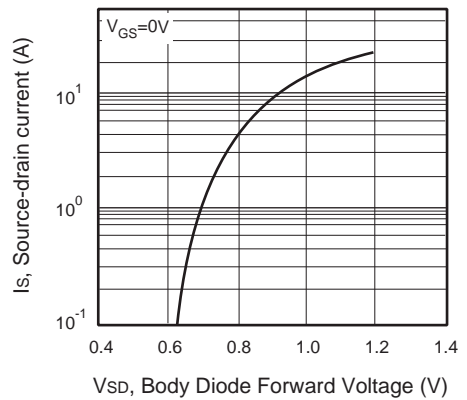**Figure 5. Gate Threshold Variation with Temperature**

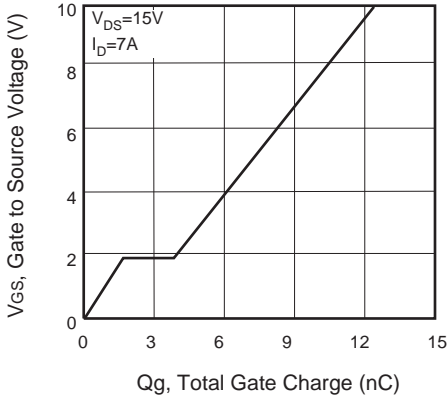**Figure 6. Body Diode Forward Voltage Variation with Source Current**
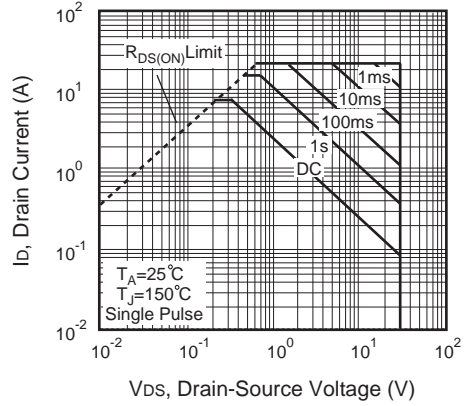
Figure 7. Gate Charge
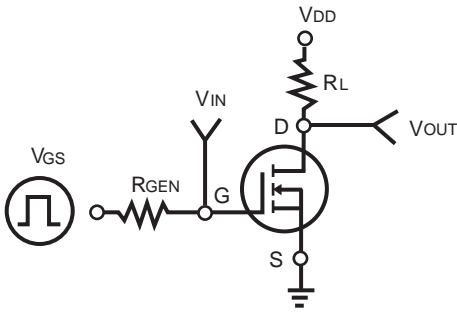

Figure 8. Maximum Safe
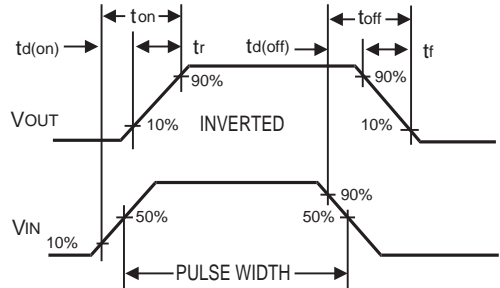Operating Area

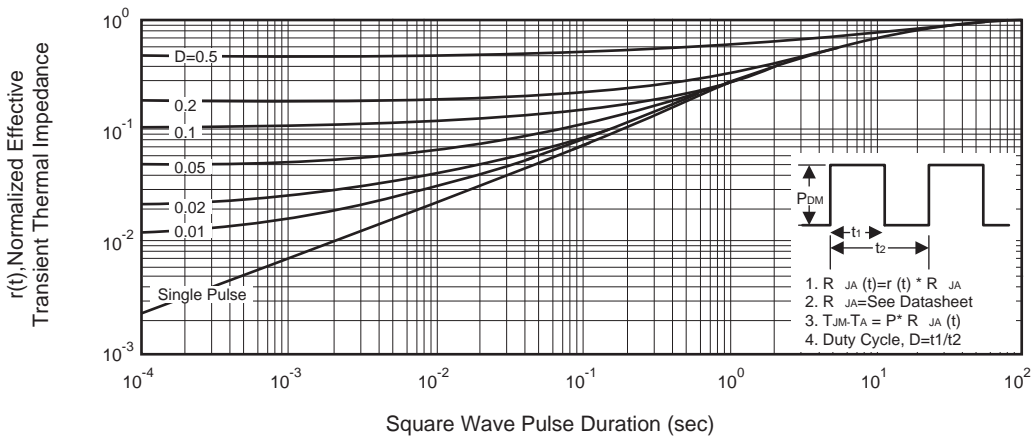Figure 9. Switching Test Circuit

Figure 10. Switching Waveforms

Figure 11. Normalized Thermal Transient Impedance Curve