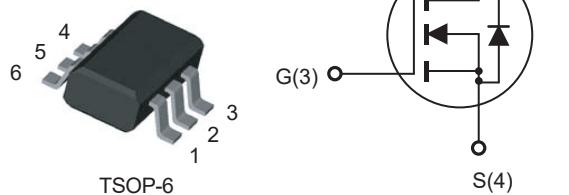


**N-Channel Enhancement Mode Field Effect Transistor****FEATURES**

- 30V, 6.3A ,  $R_{DS(ON)} = 32m\Omega$  @ $V_{GS} = 10V$ .  
 $R_{DS(ON)} = 44m\Omega$  @ $V_{GS} = 4.5V$ .
- High dense cell design for extremely low  $R_{DS(ON)}$ .
- Rugged and reliable.
- RoHS compliant.
- TSOP-6 package.

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

Parameter	Symbol	Limit	Units
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	6.3	A
Drain Current-Pulsed <sup>a</sup>	$I_{DM}$	25.2	A
Maximum Power Dissipation	$P_D$	2	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 <sup>b</sup>	$R_{\theta JA}$	62.5	$^\circ C/W$



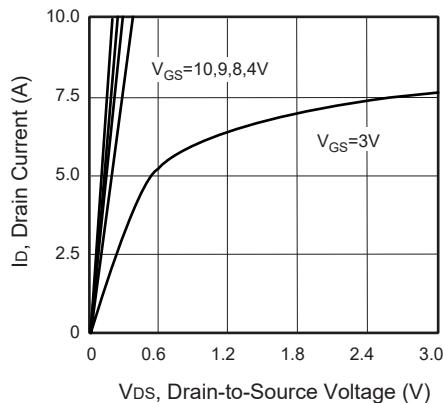
# CEH2316A

## Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

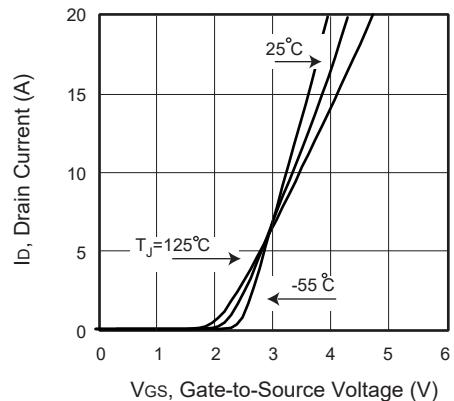
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$	30			V
Zero Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{\text{DS}} = 30\text{V}, V_{\text{GS}} = 0\text{V}$			1	$\mu\text{A}$
Gate Body Leakage Current, Forward	$I_{\text{GSSF}}$	$V_{\text{GS}} = 20\text{V}, V_{\text{DS}} = 0\text{V}$			100	nA
Gate Body Leakage Current, Reverse	$I_{\text{GSSR}}$	$V_{\text{GS}} = -20\text{V}, V_{\text{DS}} = 0\text{V}$			-100	nA
<b>On Characteristics<sup>c</sup></b>						
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}} = V_{\text{DS}}, I_D = 250\mu\text{A}$	1		3	V
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 10\text{V}, I_D = 4\text{A}$		25	32	$\text{m}\Omega$
		$V_{\text{GS}} = 4.5\text{V}, I_D = 3\text{A}$		34	44	$\text{m}\Omega$
<b>Dynamic Characteristics<sup>d</sup></b>						
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}} = 15\text{V}, V_{\text{GS}} = 0\text{V}, f = 1.0 \text{ MHz}$		345		pF
Output Capacitance	$C_{\text{oss}}$			105		pF
Reverse Transfer Capacitance	$C_{\text{rss}}$			70		pF
<b>Switching Characteristics<sup>d</sup></b>						
Turn-On Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = 24\text{V}, I_D = 5\text{A}, V_{\text{GS}} = 10\text{V}, R_{\text{GEN}} = 3\Omega$		7		ns
Turn-On Rise Time	$t_r$			5		ns
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$			26		ns
Turn-Off Fall Time	$t_f$			8		ns
Total Gate Charge	$Q_g$	$V_{\text{DS}} = 24\text{V}, I_D = 5\text{A}, V_{\text{GS}} = 4.5\text{V}$		6.2		nC
Gate-Source Charge	$Q_{\text{gs}}$			0.7		nC
Gate-Drain Charge	$Q_{\text{gd}}$			3.9		nC
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Drain-Source Diode Forward Current	$I_S$				1.6	A
Drain-Source Diode Forward Voltage <sup>c</sup>	$V_{\text{SD}}$	$V_{\text{GS}} = 0\text{V}, I_S = 2\text{A}$			1.2	V

Notes :

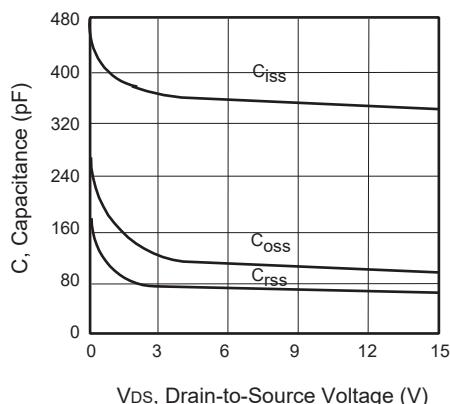
- a.Repetitive Rating : Pulse width limited by maximum junction temperature.
- b.Surface Mounted on FR4 Board, t  $\leq 10$  sec.
- c.Pulse Test : Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
- d.Guaranteed by design, not subject to production testing.



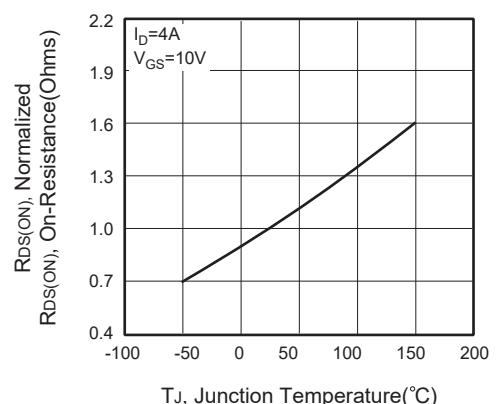
**Figure 1. Output Characteristics**



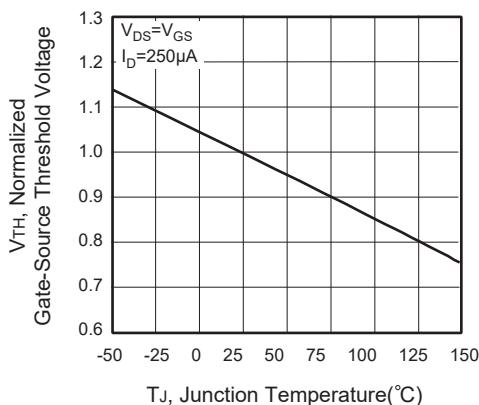
**Figure 2. Transfer Characteristics**



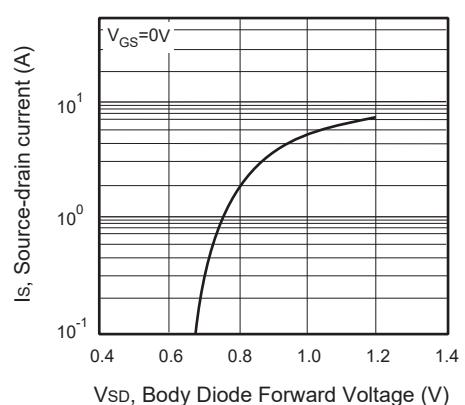
**Figure 3. Capacitance**



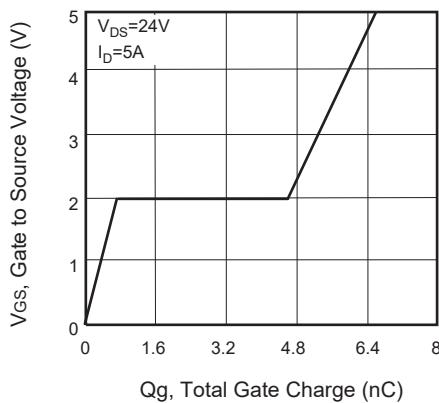
**Figure 4. On-Resistance Variation with Temperature**



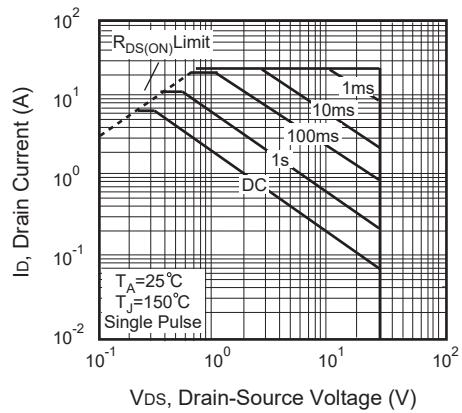
**Figure 5. Gate Threshold Variation with Temperature**



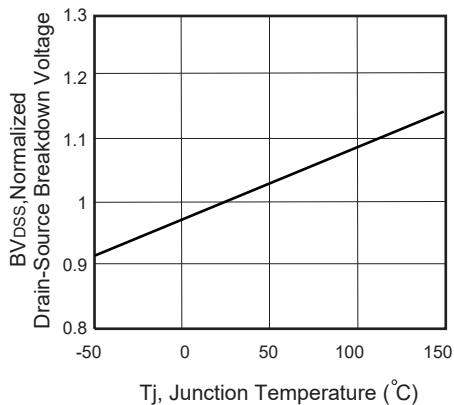
**Figure 6. Body Diode Forward Voltage Variation with Source Current**



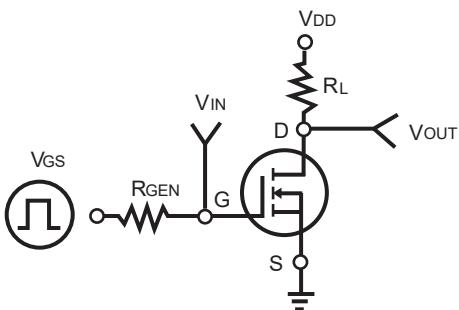
**Figure 7. Gate Charge**



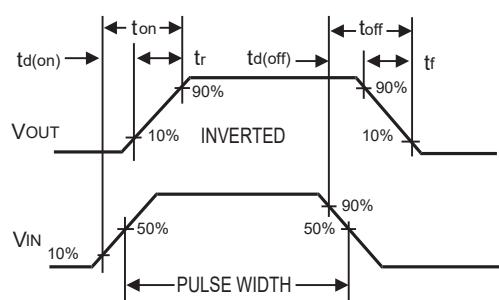
**Figure 8. Maximum Safe Operating Area**



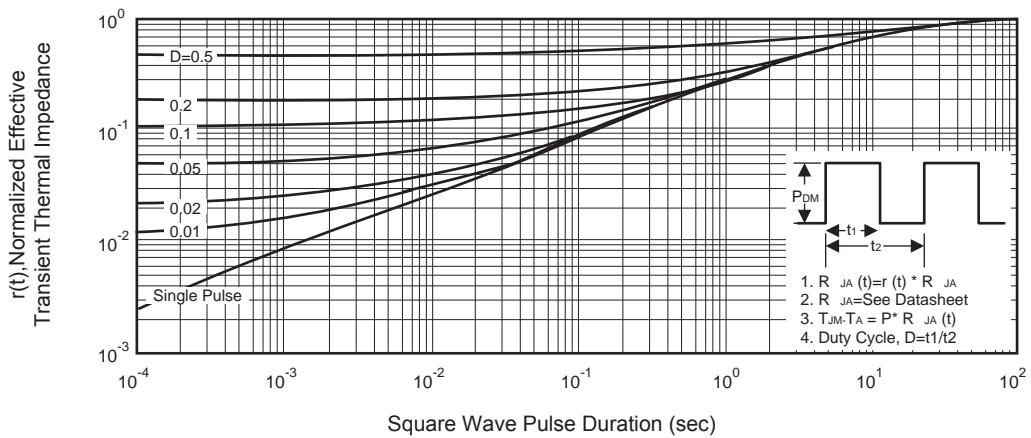
**Figure 9. Breakdown Voltage Variation VS Temperature**



**Figure 10. Switching Test Circuit**



**Figure 11. Switching Waveforms**



**Figure 12. Normalized Thermal Transient Impedance Curve**