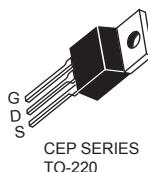
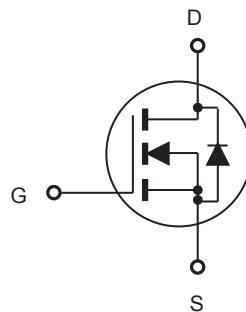


FEATURES

- 60V, 72A, $R_{DS(ON)} = 10\text{m}\Omega$ @ $V_{GS} = 10\text{V}$.
 $R_{DS(ON)} = 13.5\text{m}\Omega$ @ $V_{GS} = 4.5\text{V}$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handing capability.
- Lead-free plating ; RoHS compliant.
- TO-220 & TO-263 package.

CEB SERIES
TO-263(DD-PAK)CEP SERIES
TO-220**ABSOLUTE MAXIMUM RATINGS** $T_C = 25^\circ\text{C}$ unless otherwise noted^z

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous @ $T_C = 25^\circ\text{C}$ @ $T_C = 100^\circ\text{C}$	I_D	72 51	A
Drain Current-Pulsed ^a	I_{DM}	288	A
Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$ - Derate above 25°C	P_D	75 0.5	W W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy ^d	E_{AS}	132	mJ
Single Pulsed Avalanche Current ^d	I_{AS}	23	A
Operating and Store Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	R_{JC}	2	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	R_{JA}	62.5	$^\circ\text{C/W}$



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

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{\text{DS}} = 60\text{V}, V_{\text{GS}} = 0\text{V}$			1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{\text{GS}} = 20\text{V}, V_{\text{DS}} = 0\text{V}$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{\text{GS}} = -20\text{V}, V_{\text{DS}} = 0\text{V}$			-100	nA
On Characteristics^b						
Gate Threshold Voltage	$V_{\text{GS(th)}}$	$V_{\text{GS}} = V_{\text{DS}}, I_D = 250\mu\text{A}$	1		3	V
Static Drain-Source On-Resistance	$R_{\text{DS(on)}}$	$V_{\text{GS}} = 10\text{V}, I_D = 20\text{A}$		8	10	$\text{m}\Omega$
		$V_{\text{GS}} = 4.5\text{V}, I_D = 10\text{A}$		10	13.5	$\text{m}\Omega$
Dynamic Characteristics^c						
Input Capacitance	C_{iss}	$V_{\text{DS}} = 25\text{V}, V_{\text{GS}} = 0\text{V}, f = 1.0 \text{ MHz}$		2815		pF
Output Capacitance	C_{oss}			235		pF
Reverse Transfer Capacitance	C_{rss}			165		pF
Switching Characteristics^c						
Turn-On Delay Time	$t_{\text{d(on)}}$	$V_{\text{DD}} = 30\text{V}, I_D = 20\text{A}, V_{\text{GS}} = 10\text{V}, R_{\text{GEN}} = 4.7\Omega$		19	38	ns
Turn-On Rise Time	t_r			10	20	ns
Turn-Off Delay Time	$t_{\text{d(off)}}$			75	150	ns
Turn-Off Fall Time	t_f			12	24	ns
Total Gate Charge	Q_g	$V_{\text{DS}} = 48\text{V}, I_D = 20\text{A}, V_{\text{GS}} = 4.5\text{V}$		32	42	nC
Gate-Source Charge	Q_{gs}			7		nC
Gate-Drain Charge	Q_{gd}			18		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S				62.5	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{\text{GS}} = 0\text{V}, I_S = 20\text{A}$			1.2	V
Notes :						
a.Repetitive Rating : Pulse width limited by maximum junction temperature. ^a						
b.Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$. ^a						
c.Guaranteed by design, not subject to production testing. ^a						
d.L = 0.5mH, $I_{AS} = 23\text{A}$, $V_{DD} = 24\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$						

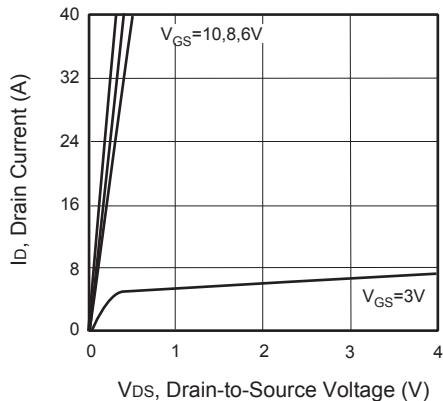


Figure 1. Output Characteristics

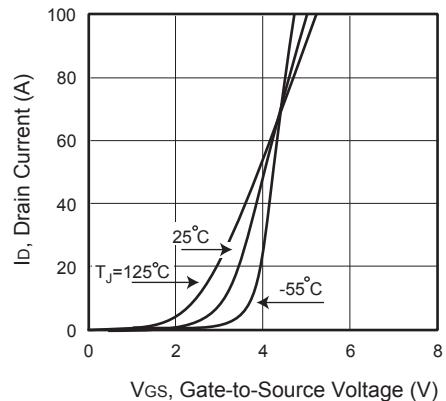


Figure 2. Transfer Characteristics

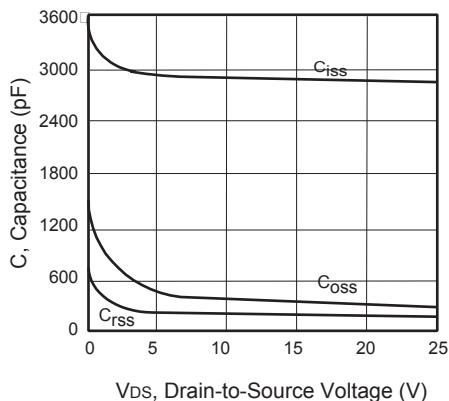


Figure 3. Capacitance

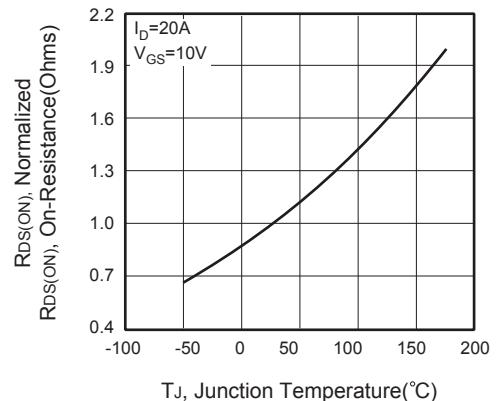


Figure 4. On-Resistance Variation with Temperature

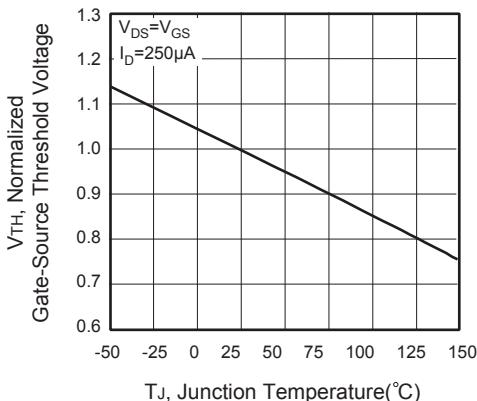


Figure 5. Gate Threshold Variation with Temperature

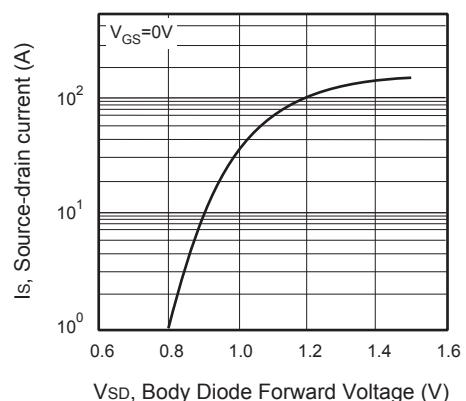


Figure 6. Body Diode Forward Voltage Variation with Source Current



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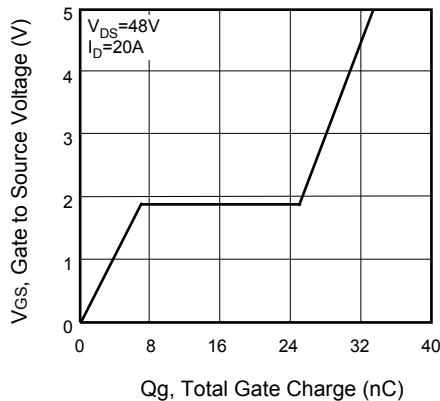


Figure 7. Gate Charge

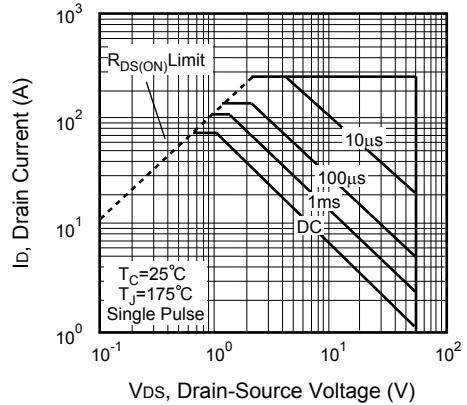


Figure 8. Maximum Safe
Operating Area

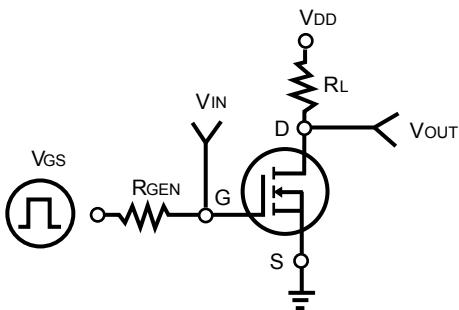


Figure 9. Switching Test Circuit

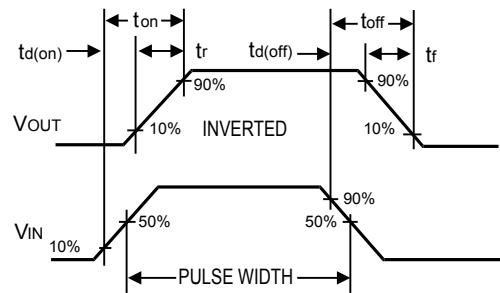


Figure 10. Switching Waveforms

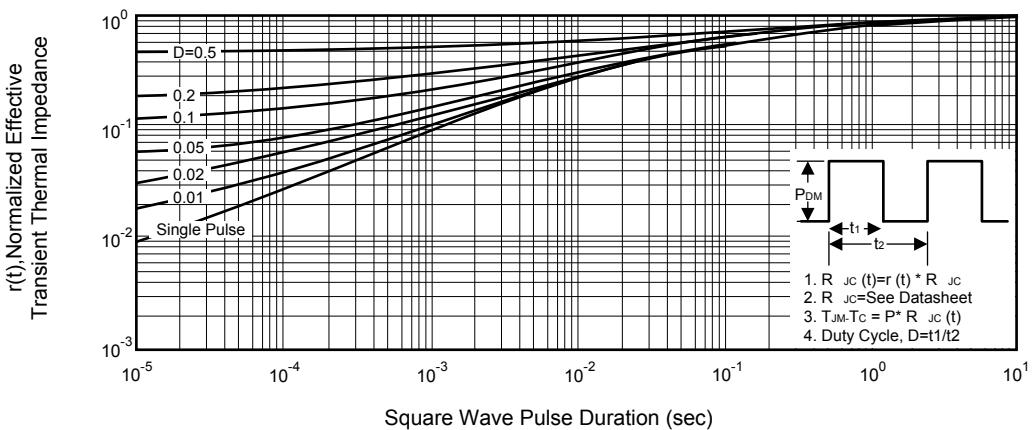


Figure 11. Normalized Thermal Transient Impedance Curve