

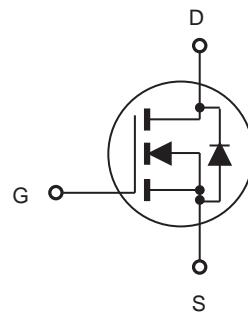


CEP76139/CEB76139

N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- 30V, 75A, $R_{DS(ON)} = 7\text{m}\Omega$ @ $V_{GS} = 10\text{V}$.
 $R_{DS(ON)} = 10\text{m}\Omega$ @ $V_{GS} = 4.5\text{V}$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handing capability.
- Lead free product is acquired.
- 100% avalanche tested.
- TO-220 & TO-263 package.



ABSOLUTE MAXIMUM RATINGS $T_C = 25^\circ\text{C}$ 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	75	A
Drain Current-Pulsed ^a	I_{DM}	225	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}	228	mJ
Single Pulsed Avalanche Current ^d	I_{AS}	100	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	$R_{\theta JC}$	2.0	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$



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

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Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{\text{DS}} = 30\text{V}, V_{\text{GS}} = 0\text{V}$			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	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}} = V_{\text{DS}}, I_D = 250\mu\text{A}$	1		3	V
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 10\text{V}, I_D = 40\text{A}$ $V_{\text{GS}} = 4.5\text{V}, I_D = 37\text{A}$		5	7	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{\text{DS}} = 10\text{V}, I_D = 40\text{A}$		45		S
Dynamic Characteristics^c						
Input Capacitance	C_{iss}	$V_{\text{DS}} = 15\text{V}, V_{\text{GS}} = 0\text{V}, f = 1.0 \text{ MHz}$		3298		pF
Output Capacitance	C_{oss}			1400		pF
Reverse Transfer Capacitance	C_{rss}			287		pF
Switching Characteristics^c						
Turn-On Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = 15\text{V}, I_D = 60\text{A}, V_{\text{GS}} = 10\text{V}, R_{\text{GEN}} = 6\Omega$		20	38	ns
Turn-On Rise Time	t_r			12	23	ns
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$			113	198	ns
Turn-Off Fall Time	t_f			40	78	ns
Total Gate Charge	Q_g	$V_{\text{DS}} = 15, I_D = 40\text{A}, V_{\text{GS}} = 5\text{V}$		48	55	nC
Gate-Source Charge	Q_{gs}			10		nC
Gate-Drain Charge	Q_{gd}			27		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S				75	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{\text{GS}} = 0\text{V}, I_S = 40\text{A}$			1.3	V

Notes :

- a.Repetitive Rating : Pulse width limited by maximum junction temperature.
 - b.Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
 - c.Guaranteed by design, not subject to production testing.
- d.L = 20 μH , $I_{AS} = 100\text{A}$, $V_{DD} = 24\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$



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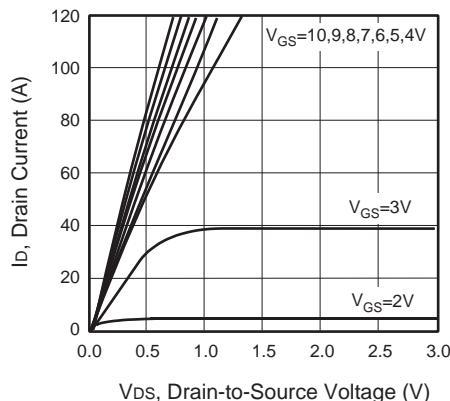


Figure 1. Output Characteristics

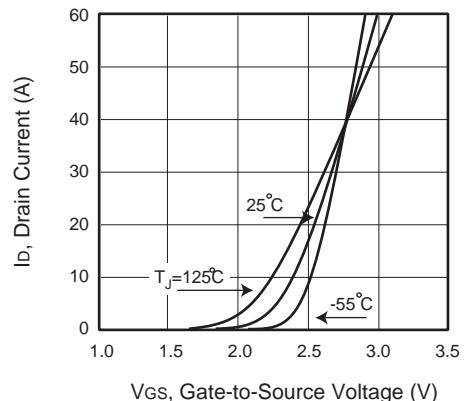


Figure 2. Transfer Characteristics

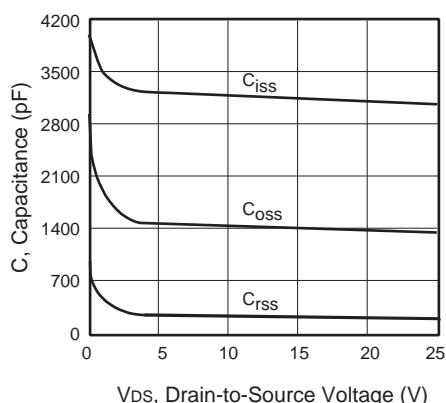


Figure 3. Capacitance

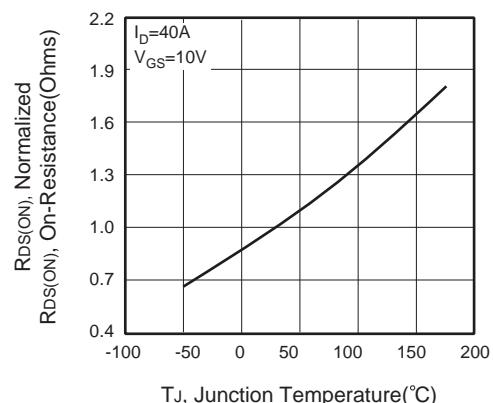


Figure 4. On-Resistance Variation with Temperature

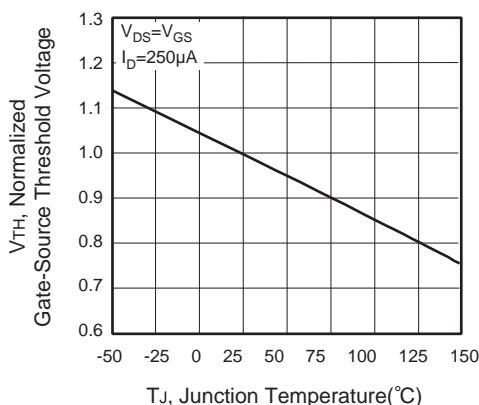


Figure 5. Gate Threshold Variation with Temperature

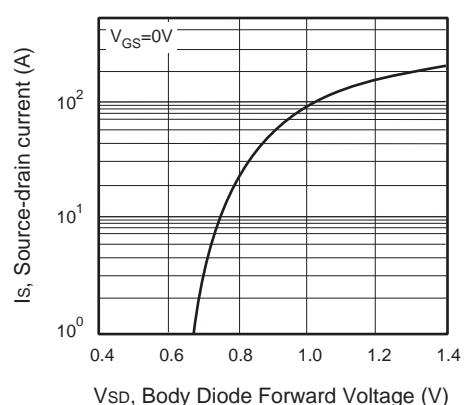


Figure 6. Body Diode Forward Voltage Variation with Source Current



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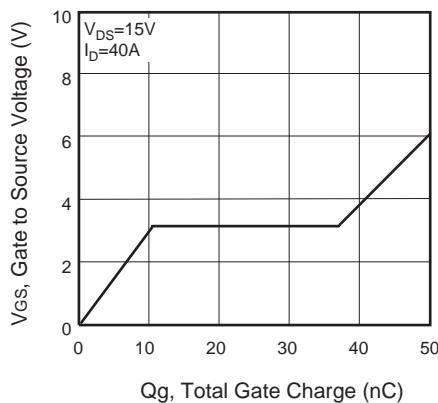


Figure 7. Gate Charge

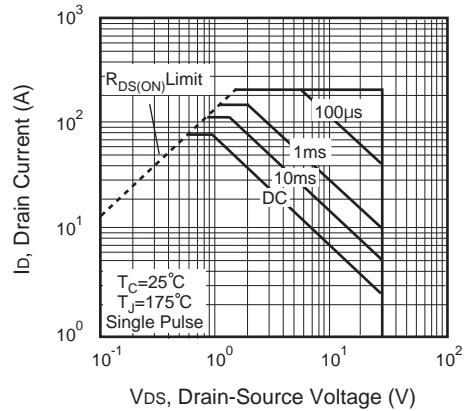


Figure 8. Maximum Safe Operating Area

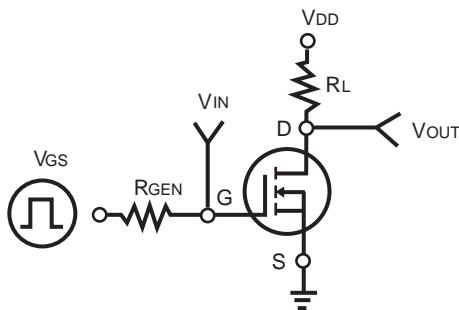


Figure 9. Switching Test Circuit

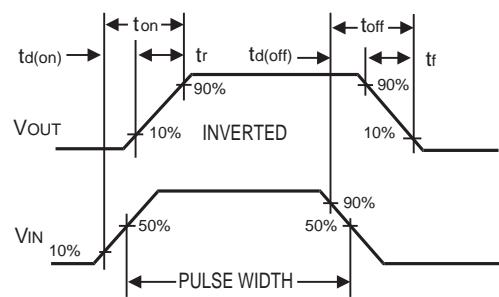


Figure 10. Switching Waveforms

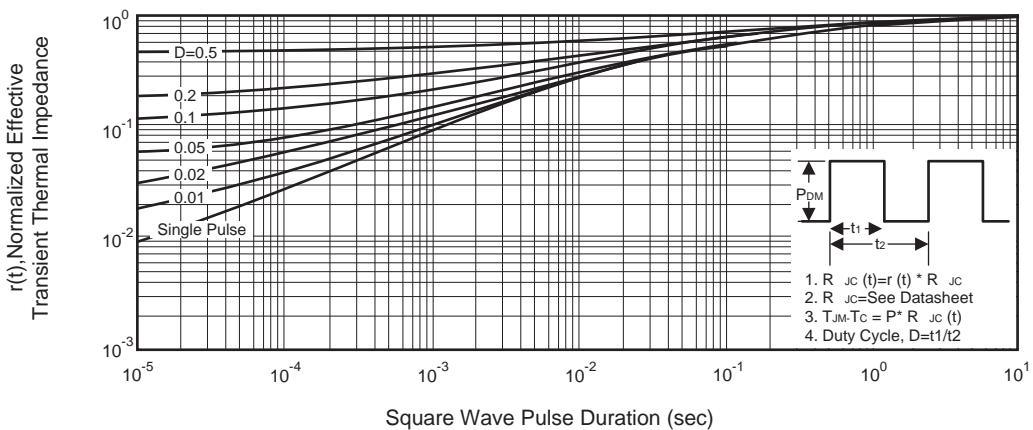


Figure 11. Normalized Thermal Transient Impedance Curve