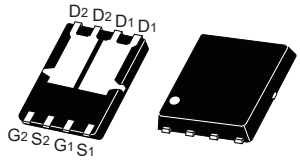
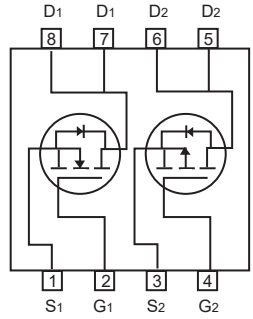
CEZ4269A

Dual Enhancement Mode Field Effect Transistor (N and P Channel) PRELIMINARY

FEATURES

- 40V, 29A, $R_{DS(ON)}$ = 20.5mΩ @V_{GS} = 10V.
- -40V, -19.4A, $R_{DS(ON)}$ = 46mΩ @V_{GS} = -10V.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handing capability.
- Pb-free lead plating ; RoHS compliant.
- Halogen Free.
- Surface mount Package.





P-PAK 5X6

ABSOLUTE MAXIMUM RATINGS T_C = 25°C unless otherwise noted

Parameter	Symbol	N-Channel	P-Channel	Units
Drain-Source Voltage	V_{DS}	40	-40	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Drain Current-Continuous	I_D @$R_{\theta JC}$	29	-19.4	A
	I_D @$R_{\theta JA}$	9.7	-6.5	A
Drain Current-Pulsed [a]	I_{DM} @$R_{\theta JC}$	116	-77.6	A
	I_{DM} @$R_{\theta JA}$	38.8	-26	A
Maximum Power Dissipation	P_D	27.8	27.8	W
Operating and Store Temperature Range	T_J,T_{stg}	-55 to 150		°C

Thermal Characteristics

Parameter	Symbol	Limit		Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.5	4.5	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40		°C/W

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

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N-Channel Electrical Characteristics T_C = 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 = 250μA	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40V, 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 [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 250μA	1		3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D =15A		15.5	20.5	mΩ
		V_{GS} = 4.5V, I_D =10A		20	26	mΩ
Dynamic Characteristics [c]						
Input Capacitance	C_{iss}	V_{DS} = 20V, V_{GS} = 0V, f = 1.0 MHz		765		pF
Output Capacitance	C_{oss}			70		pF
Reverse Transfer Capacitance	C_{rss}			45		pF
Switching Characteristics [c]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 20V, I_D = 10A, V_{GS} = 10V, R_{GEN} = 3Ω		10		ns
Turn-On Rise Time	t_r			14		ns
Turn-Off Delay Time	$t_{d(off)}$			35		ns
Turn-Off Fall Time	t_f			11		ns
Total Gate Charge	Q_g	V_{DS} = 32V, I_D = 15A, V_{GS} = 10V		15		nC
Gate-Source Charge	Q_{gs}			3		nC
Gate-Drain Charge	Q_{gd}			3		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S				23	A
Drain-Source Diode Forward Voltage [b]	V_{SD}	V_{GS} = 0V, I_S = 1A			1.2	V
Reverse Recovery Time	T_{rr}	I_F = 6A,di/dt = 100A/us		18		ns
Reverse Recovery Charge	Q_{rr}			8		nC

Notes :
a.Repetitive Rating : Pulse width limited by maximum junction temperature.
b.Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
c.Guaranteed by design, not subject to production testing.

P-Channel Electrical Characteristics T_C = 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 = -250μA	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -40V, 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 [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = -250μA	-1		-3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D =-15A		35	46	mΩ
		V_{GS} = -4.5V, I_D =-10A		46	60	mΩ
Dynamic Characteristics [c]						
Input Capacitance	C_{iss}	V_{DS} = -20V, V_{GS} = 0V, f = 1.0 MHz		1050		pF
Output Capacitance	C_{oss}			60		pF
Reverse Transfer Capacitance	C_{rss}			55		pF
Switching Characteristics [c]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -20V, I_D = -10A, V_{GS} = -10V, R_{GEN} = 3Ω		15		ns
Turn-On Rise Time	t_r			12		ns
Turn-Off Delay Time	$t_{d(off)}$			187		ns
Turn-Off Fall Time	t_f			80		ns
Total Gate Charge	Q_g	V_{DS} = -20V, I_D = -10A, V_{GS} = -10V		21		nC
Gate-Source Charge	Q_{gs}			2		nC
Gate-Drain Charge	Q_{gd}			6		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S				-19	A
Drain-Source Diode Forward Voltage [b]	V_{SD}	V_{GS} = 0V, I_S = -1A			-1.2	V
Reverse Recovery Time	T_{rr}	I_F = -6A,di/dt = 100A/us		14		ns
Reverse Recovery Charge	Q_{rr}			9		nC

Notes :
a.Repetitive Rating : Pulse width limited by maximum junction temperature.
b.Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
c.Guaranteed by design, not subject to production testing.

N-CHANNEL

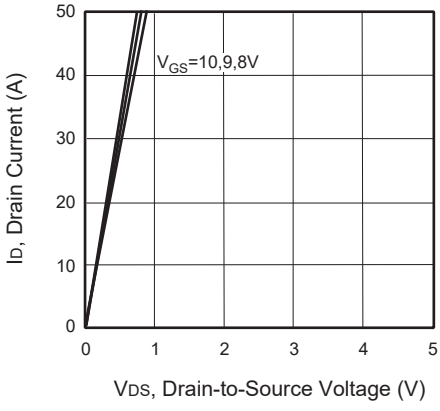

Figure 1. Output Characteristics

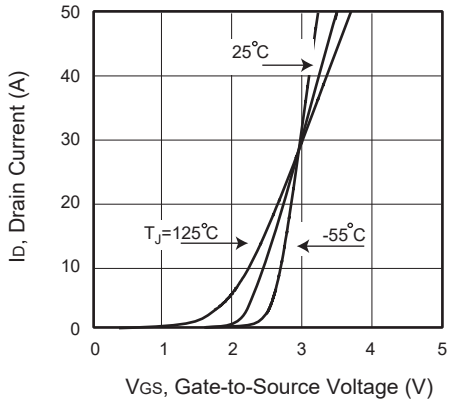

Figure 2. Transfer Characteristics

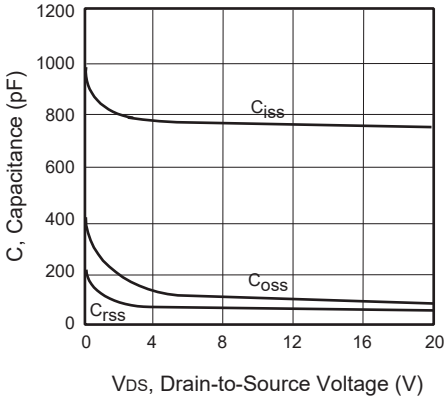

Figure 3. Capacitance

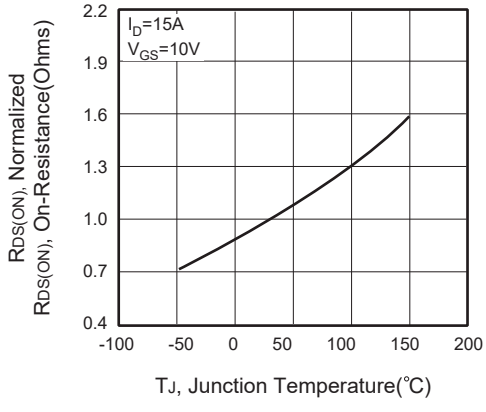

Figure 4. On-Resistance Variation with Temperature

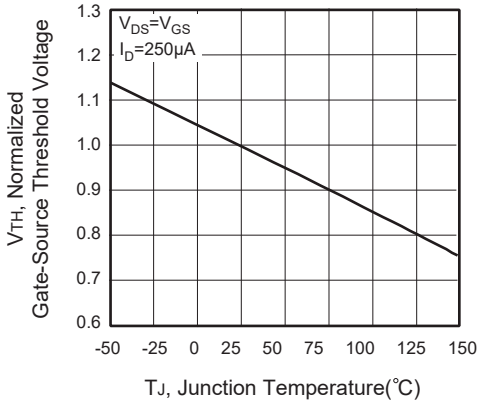

Figure 5. Gate Threshold Variation with Temperature

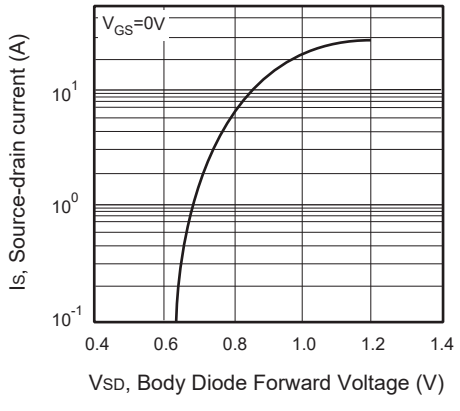

Figure 6. Body Diode Forward Voltage Variation with Source Current

P-CHANNEL

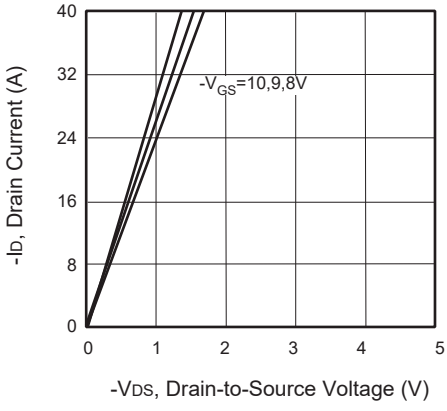

Figure 7. Output Characteristics

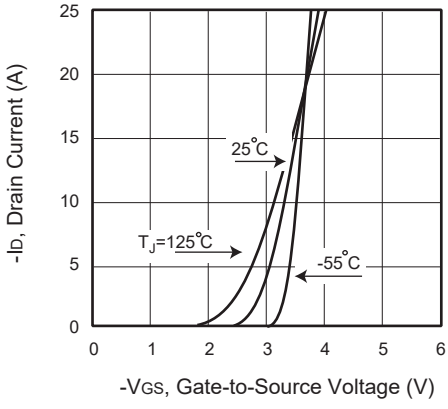

Figure 8. Transfer Characteristics

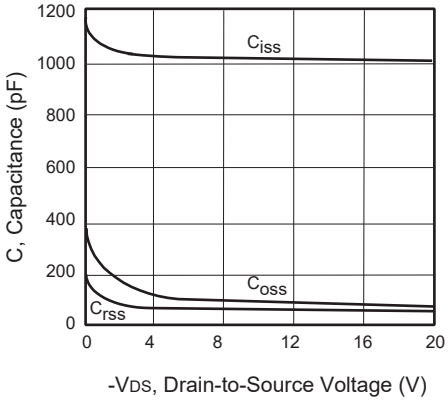

Figure 9. Capacitance

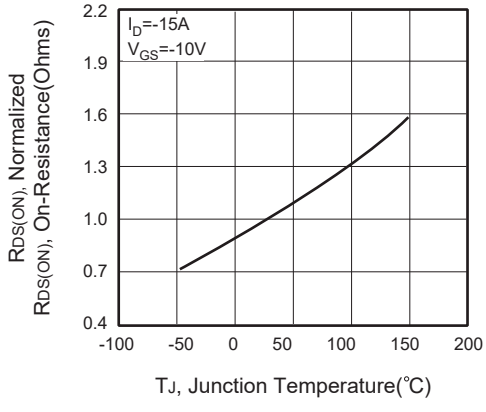

Figure 10. On-Resistance Variation with Temperature

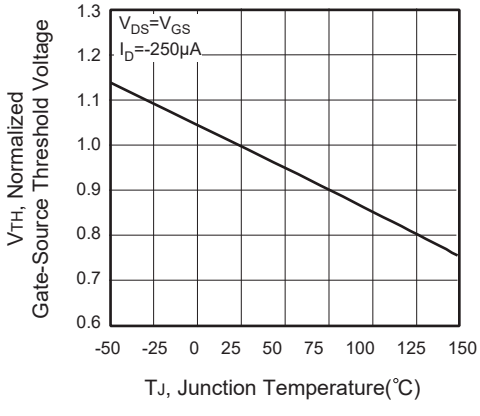

Figure 11. Gate Threshold Variation with Temperature

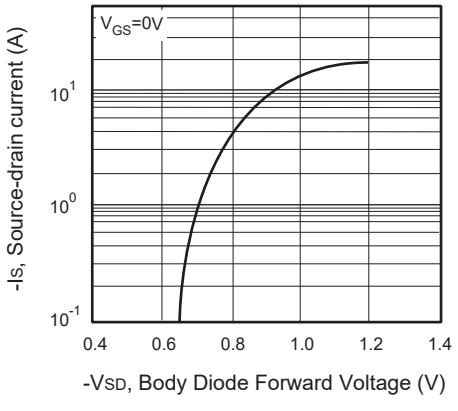

Figure 12. Body Diode Forward Voltage Variation with Source Current

N-CHANNEL

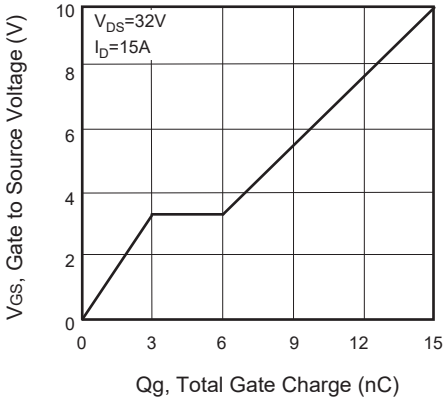

Figure 13. Gate Charge

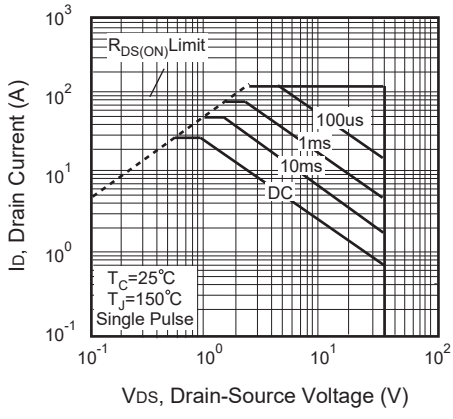

Figure 14. Maximum Safe Operating Area

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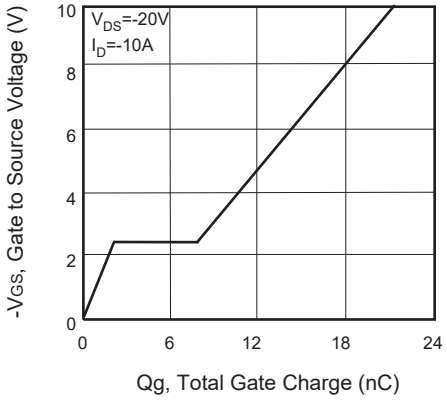

Figure 15. Gate Charge

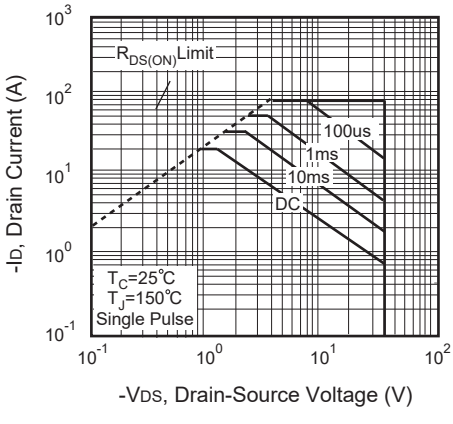

Figure 16. Maximum Safe Operating Area

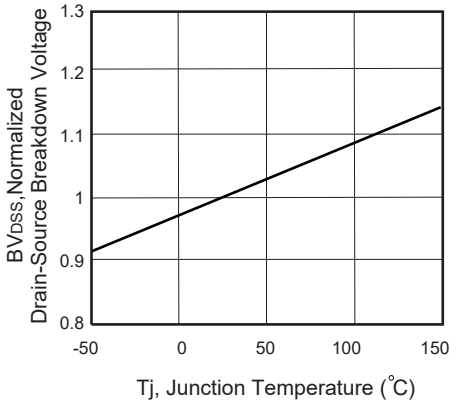

Figure 17. Breakdown Voltage Variation VS Temperature

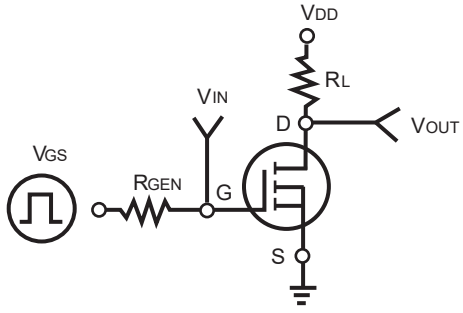

Figure 18. Switching Test Circuit

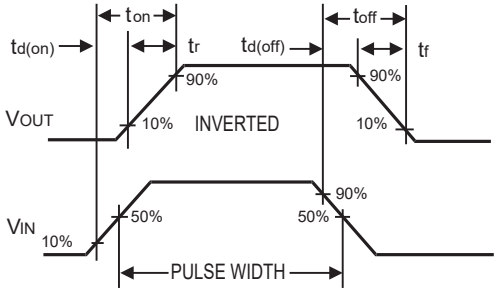

Figure 19. Switching Waveforms

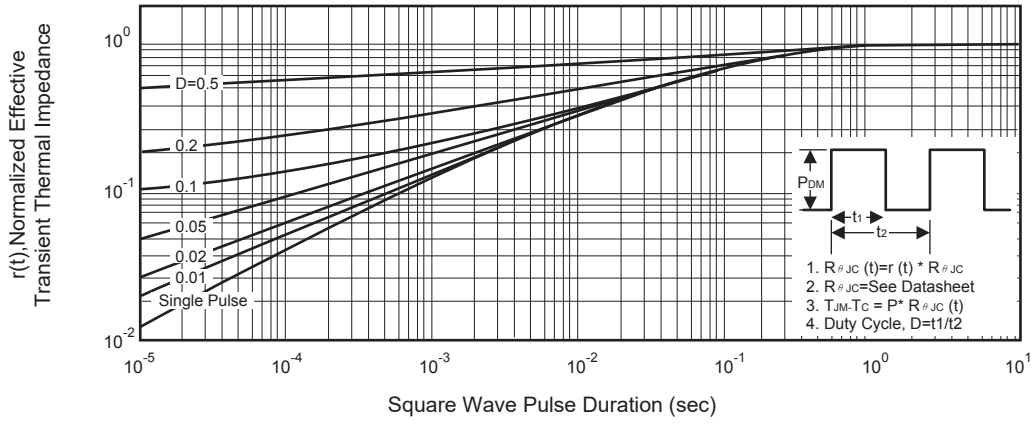

Figure 20. Normalized Thermal Transient Impedance Curve