

## CEZ6R40SL-HF

**N-Channel  
RoHS Device  
Halogen Free**



### Features

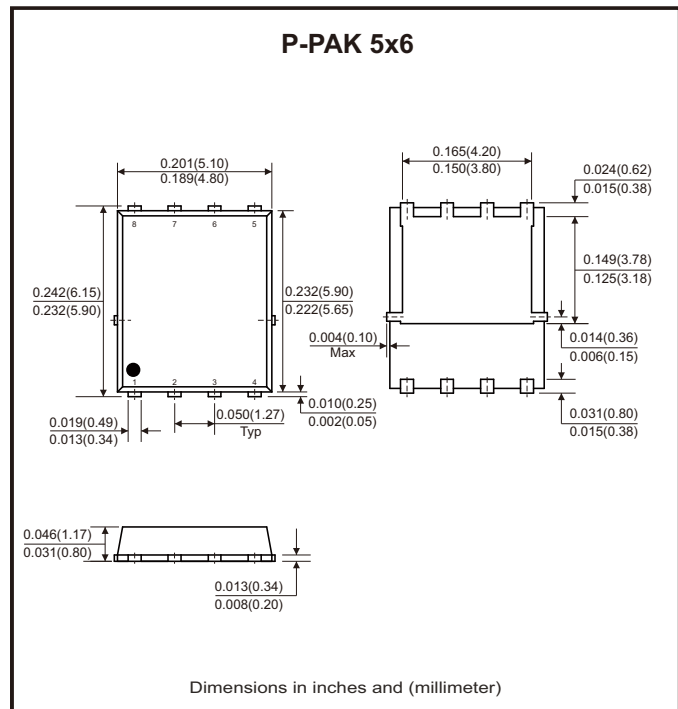
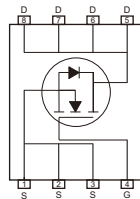
- Super high density cell design for extremely low  $R_{DS(ON)}$ .
- High power and current handling capability.
- Surface mount package.

### Mechanical data

- Case: P-PAK 5x6, molded plastic.
- Mounting position: Any.

### Circuit Diagram

- G : Gate
- S : Source
- D : Drain



### Maximum Ratings (at $T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	65	V
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D @ R_{\theta JC}$	93	A
	$I_D @ R_{\theta JA}$	27	
Drain current-pulsed (Note 1)	$I_{DM} @ R_{\theta JC}$	372	A
	$I_{DM} @ R_{\theta JA}$	108	
Maximum power dissipation	$P_D$	73	W
Single pulse avalanche energy (Note 5)	$E_{AS}$	250	mJ
Single pulse avalanche current (Note 5)	$I_{AS}$	10	A
Operating and storage temperature range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$
Thermal resistance, junction to case	$R_{\theta JC}$	1.7	$^\circ\text{C/W}$
Thermal resistance, junction to ambient (Note 2)	$R_{\theta JA}$	20	$^\circ\text{C/W}$

## Electrical Characteristics (at Tc=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	65			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 65V, V <sub>GS</sub> = 0V			1	μA
Gate body leakage current, forward	I <sub>GSSF</sub>	V <sub>GS</sub> = 20V, V <sub>DS</sub> = 0V			100	nA
Gate body leakage current, reverse	I <sub>GSSR</sub>	V <sub>GS</sub> = -20V, V <sub>DS</sub> = 0V			-100	
<b>On Characteristics (Note 3)</b>						
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250μA	1		3	V
Static drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A		3.6	4.5	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 15A		5.7	7.4	
<b>Dynamic Characteristics (Note 4)</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V, f = 1MHz		1790		pF
Output capacitance	C <sub>oss</sub>			725		
Reverse transfer capacitance	C <sub>rss</sub>			15		
<b>Switching Characteristics (Note 4)</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 30V, I <sub>D</sub> = 20A V <sub>GS</sub> = 10V, R <sub>GEN</sub> = 25Ω		22		nS
Turn-on rise time	t <sub>r</sub>			28		
Turn-off delay time	t <sub>d(off)</sub>			143		
Turn-off fall time	t <sub>f</sub>			90		
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = 30V, I <sub>D</sub> = 20A, V <sub>GS</sub> = 4.5V		26		nC
Gate-source charge	Q <sub>gs</sub>			4		
Gate-drain charge	Q <sub>gd</sub>			15		
<b>Drain-Source-Diode Characteristics and Maximum Ratings</b>						
Drain-source diode forward current(Note 2)	I <sub>S</sub>				60	A
Drain-source diode forward voltage(Note 3)	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 20A			1.2	V

- Notes: 1. Repetitive rating: pulse width limited by maximum junction temperature.  
 2. Surface mounted on FR4 board, t ≤ 10 sec.  
 3. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%.  
 4. Guaranteed by design, not subject to production testing.  
 5. L = 5mH, I<sub>AS</sub> = 10A, V<sub>DD</sub> = 24V, R<sub>G</sub> = 25Ω, starting T<sub>J</sub> = 25°C.

## Rating and Characteristic Curves (CEZ6R40SL-HF)

Fig.1 - Output Characteristics

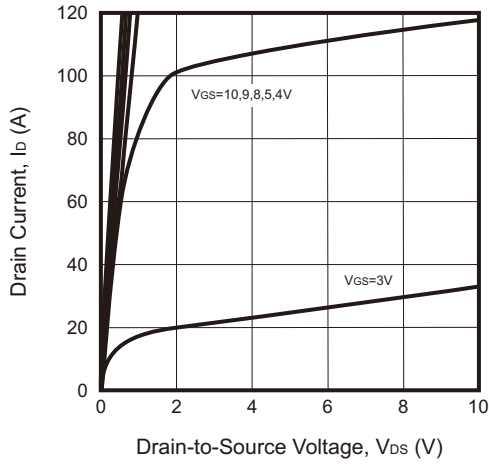


Fig.2 - Transfer Characteristics

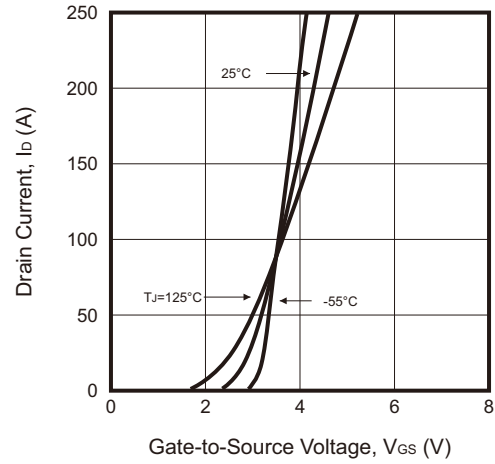


Fig.3 - Capacitance

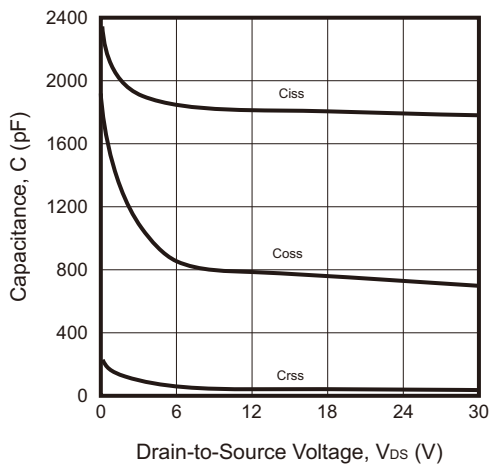


Fig.4 - On-Resistance Variation with Temperature

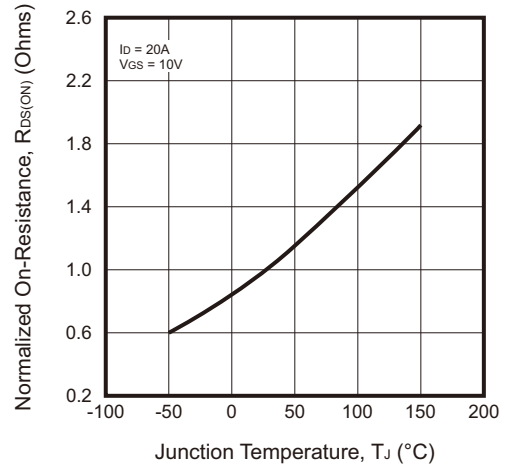


Fig.5 - Gate Threshold Variation with Temperature

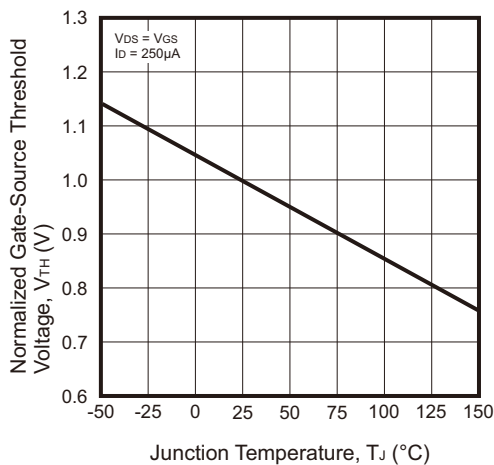
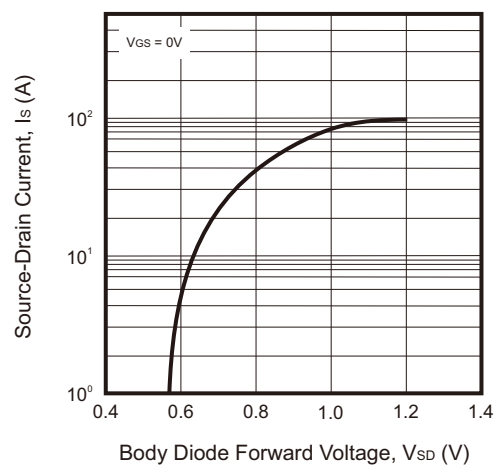


Fig.6 - Body Diode Forward Voltage Variation with Source Current



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## Rating and Characteristic Curves (CEZ6R40SL-HF)

Fig.7 - Gate Charge

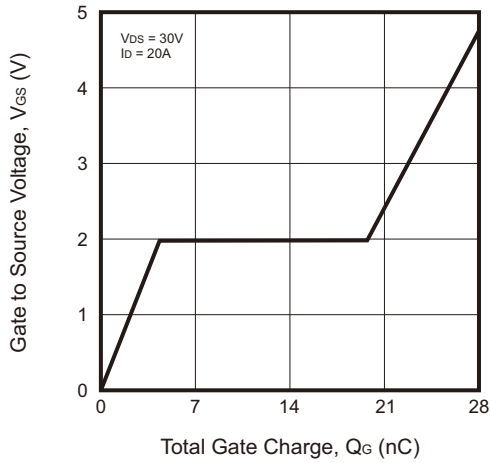


Fig.8 - Maximum Safe Operating Area

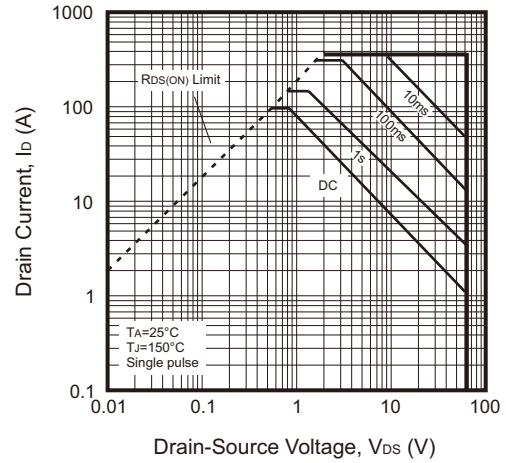
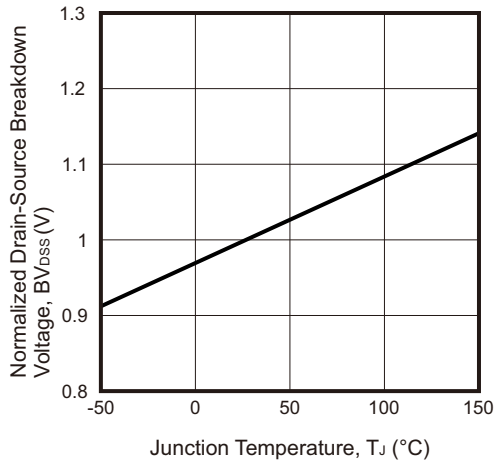
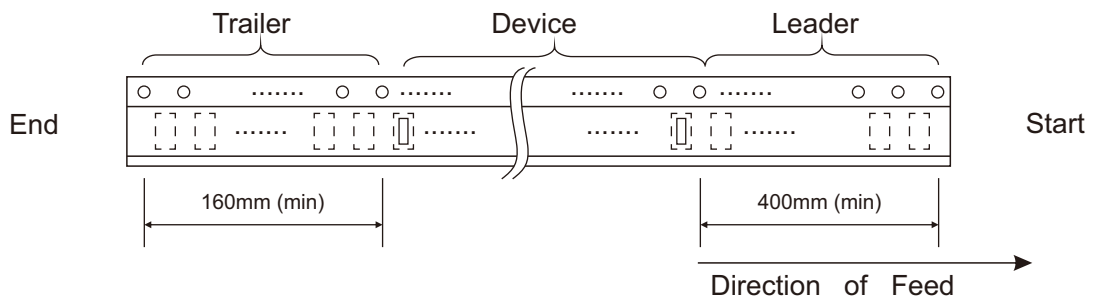
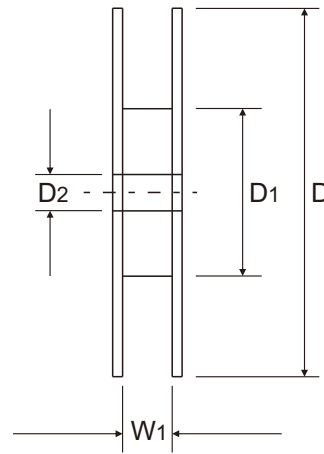
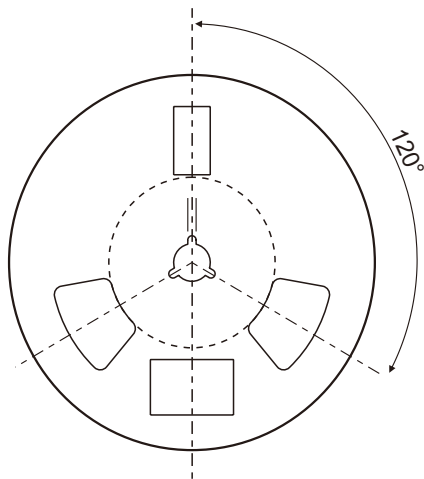
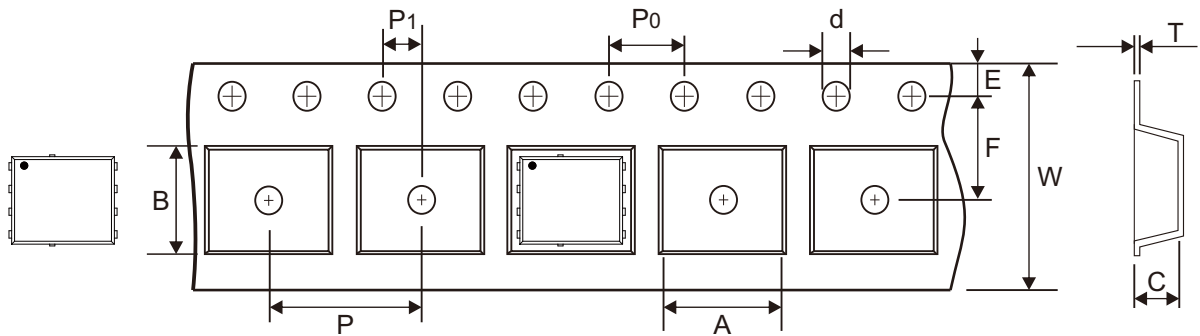


Fig.9 - Breakdown Voltage Variation vs Temperature



Reel Taping Specification



P-PAK 5x6	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	6.50 ± 0.10	5.28 ± 0.10	2.00 ± 0.10	1.50 + 0.10	330 ± 2.00	100 ± 1.00	13.00 + 0.50 - 0.20
	(inch)	0.256 ± 0.004	0.208 ± 0.004	0.079 ± 0.004	0.059 + 0.004	12.992 ± 0.079	3.937 ± 0.039	0.512 + 0.020 - 0.008

P-PAK 5x6	SYMBOL	E	F	P	P0	P1	T	W	W1
	(mm)	1.75 ± 0.10	5.50 ± 0.05	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.25 ± 0.02	12.00 + 0.30 - 0.10	12.4 Min
	(inch)	0.069 ± 0.004	0.217 ± 0.002	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.010 ± 0.001	0.472 + 0.012 - 0.004	0.488 Min

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