

# CMS25N03V8A-HF

**N-Channel  
RoHS Device  
Halogen Free**



## Features

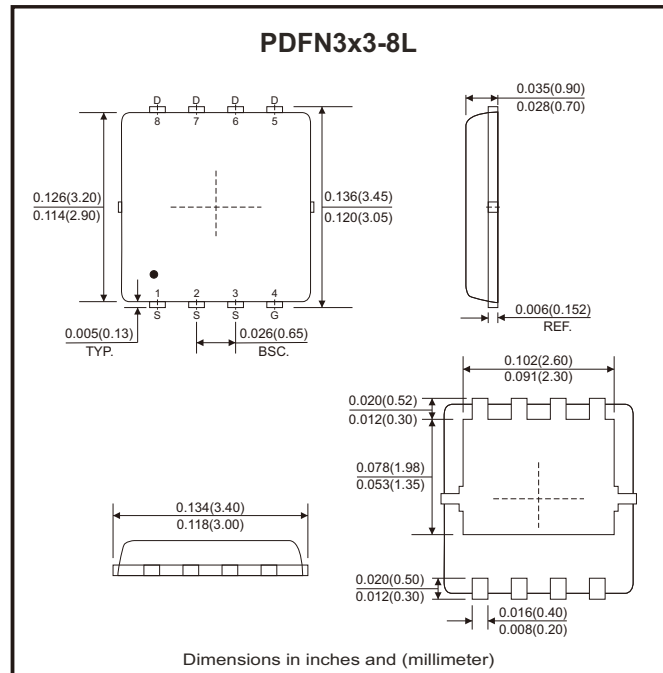
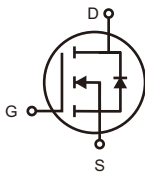
- Improved dv/dt capability.
- Fast switching.
- 30V, 25A,  $R_{DS(ON)}=18m\Omega@V_{GS}=10V$ .

## Mechanical data

- Case: PDFN3x3-8L, molded plastic.
- Mounting position: Any.

## Circuit Diagram

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



## Maximum Ratings (at $T_C=25^\circ C$ unless otherwise noted)

Parameter	Conditions	Symbol	Value	Unit
Drain-source voltage		$V_{DS}$	30	V
Gate-source voltage		$V_{GS}$	$\pm 20$	V
Drain current-continuous	$T_C = 25^\circ C$	$I_D$	25	A
	$T_C = 100^\circ C$	$I_D$	16	
Drain current-pulsed	(Note 1)	$I_{DM}$	100	A
Single pulse avalanche energy	(Note 2)	$E_{AS}$	32	mJ
Single pulse avalanche current	(Note 2)	$I_{AS}$	8	A
Power dissipation	$T_C=25^\circ C$	$P_D$	21	W
	Derate above $25^\circ C$	$P_D$	0.17	W/ $^\circ C$
Thermal resistance junction-ambient		$R_{\theta JA}$	62	$^\circ C/W$
Thermal resistance junction-case		$R_{\theta JC}$	6	$^\circ C/W$
Operating junction temperature range		$T_J$	-50 to +150	$^\circ C$
Storage temperature range		$T_{STG}$	-50 to +150	$^\circ C$

## Electrical Characteristics (at $T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Drain-source leakage current	$I_{DSS}$	$V_{DS} = 30V, V_{GS} = 0V, T_J = 25^\circ\text{C}$			1	$\mu A$
		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$			10	
Gate-source leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
<b>On Characteristics</b>						
Static drain-source on-resistance (Note 3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 12A$		14	18	m $\Omega$
		$V_{GS} = 4.5V, I_D = 8A$		20	28	
Gate threshold voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	1.2	1.6	2.5	V
Forward transconductance	$g_{fs}$	$V_{DS} = 10V, I_D = 6A$		6.5		S
<b>Dynamic and Switching Characteristics</b>						
Total gate charge (Note 3, 4)	$Q_g$	$V_{DS} = 15V, V_{GS} = 4.5V, I_D = 6A$		4.1	8	nC
Gate-source charge (Note 3, 4)	$Q_{gs}$			1	2	
Gate-drain charge (Note 3, 4)	$Q_{gd}$			2.1	4	
Turn-on delay time (Note 3, 4)	$t_{d(on)}$	$V_{DD} = 15V, V_{GS} = 10V, R_G = 6\Omega, I_D = 1A$		2.8	5	nS
Rise time (Note 3, 4)	$t_r$			7.2	14	
Turn-off delay time (Note 3, 4)	$t_{d(off)}$			15.8	30	
Fall time (Note 3, 4)	$t_f$			4.6	9	
Input capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V, F = 1\text{MHz}$		345	500	pF
Output capacitance	$C_{oss}$			55	80	
Reverse transfer capacitance	$C_{rss}$			32	45	
Gate resistance	$R_g$	$V_{GS} = 0V, V_{DS} = 0V, F = 1\text{MHz}$		3.2	6.4	$\Omega$
<b>Drain-Source Diode Characteristics and Ratings</b>						
Continuous source current	$I_S$	$V_G = V_D = 0V, \text{Force current}$			25	A
Pulsed source current (Note 3)	$I_{SM}$				50	A
Diode forward voltage (Note 3)	$V_{SD}$	$V_{GS} = 0V, I_S = 1A, T_J = 25^\circ\text{C}$		0.7	1	V

- Notes: 1. Pulse width limited by maximum junction temperature.  
 2.  $V_{DD}=25V, V_{GS}=10V, L=1mH, I_{AS}=8A, R_G=25\Omega$ , starting  $T_J=25^\circ\text{C}$ .  
 3. The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .  
 4. Essentially independent of operating temperature.

## Rating and Characteristic Curves (CMS25N03V8A-HF)

Fig.1 - Continuous Drain Current vs.  $T_c$

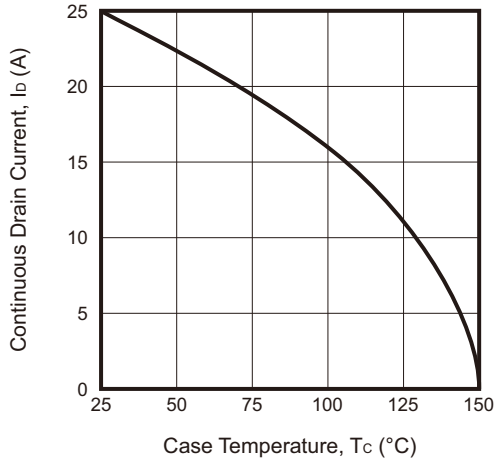


Fig.2 - Normalized  $R_{DS(ON)}$  vs.  $T_J$

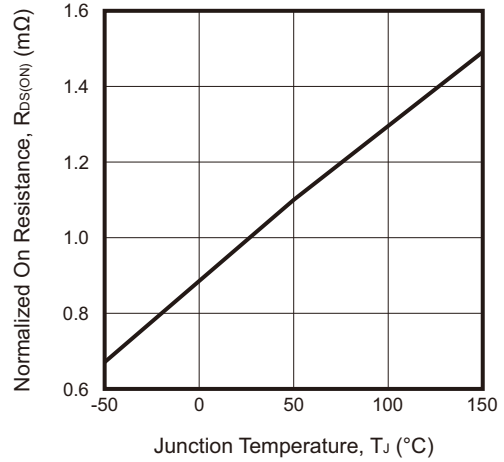


Fig.3 - Normalized  $V_{th}$  vs.  $T_J$

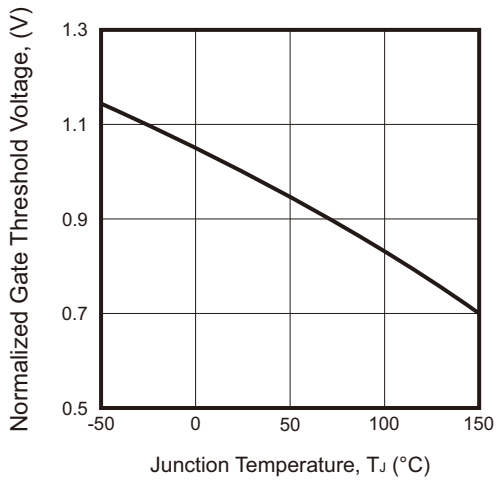


Fig.4 - Gate Charge Waveform

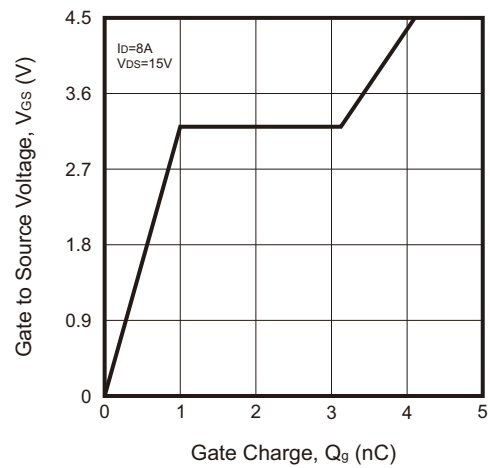
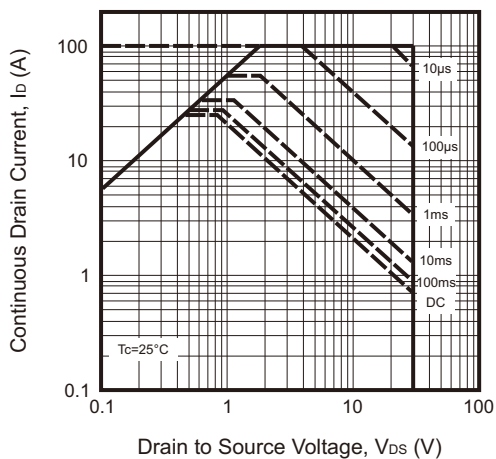
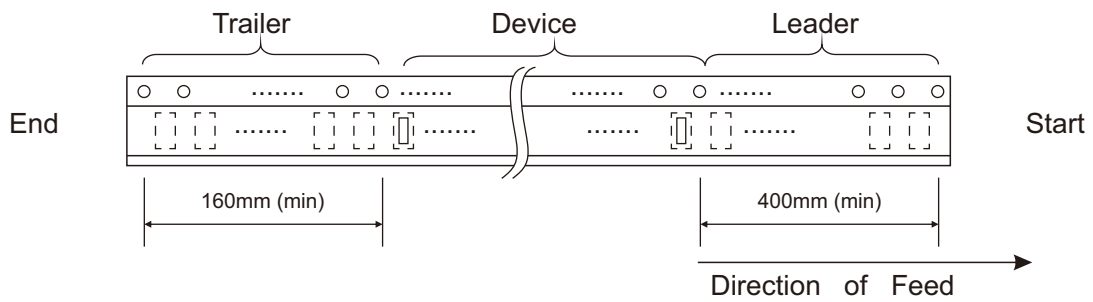
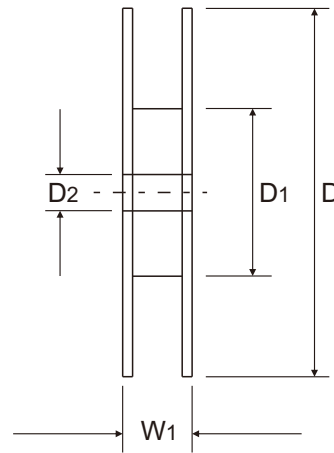
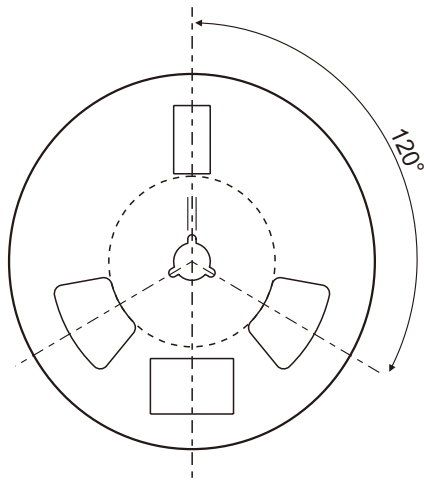
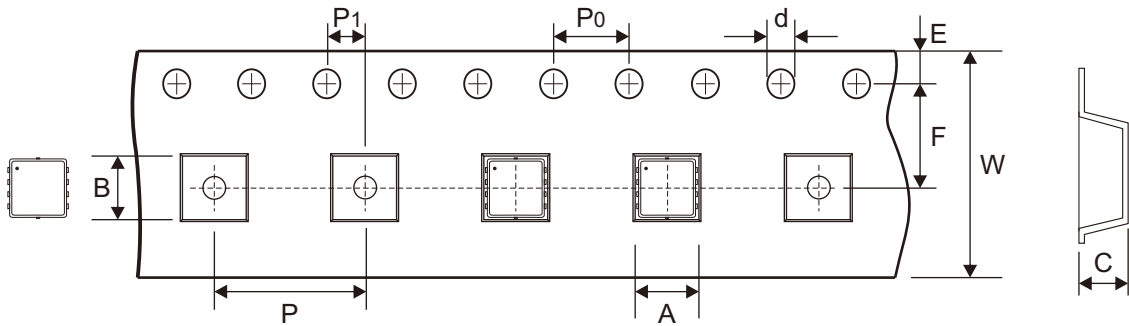


Fig.5 - Max. Safe Operating Area



Reel Taping Specification



PDFN3x3 -8L	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.60 ± 0.20	3.55 ± 0.25	1.11 ± 0.12	1.52 ± 0.13	330.5 ± 2.50	95.00 Min	13.15 ± 0.65
	(inch)	0.142 ± 0.008	0.140 ± 0.010	0.044 ± 0.005	0.060 ± 0.005	13.012 ± 0.098	3.740 Min	0.518 ± 0.026
PDFN3x3 -8L	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	5.50 ± 0.10	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	12.00 ± 0.30	18.90 Max
	(inch)	0.069 ± 0.004	0.217 ± 0.004	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.472 ± 0.012	0.744 Max