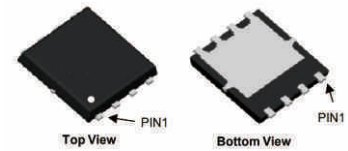


CMS85N12H8-HF

N-Channel

RoHS Device

Halogen Free



Features

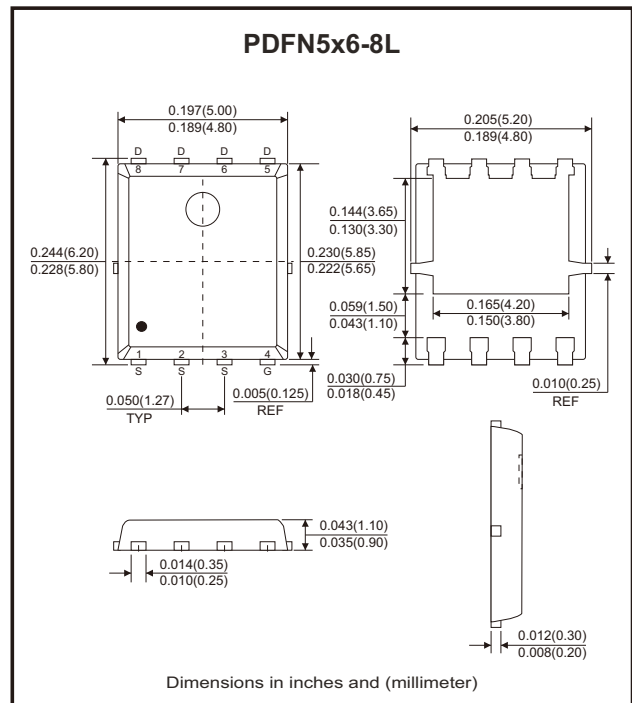
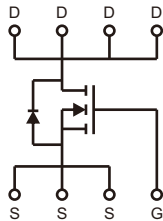
- Advanced SGT cell design.
- Low thermal resistance.
- Low gate charge.
- Fast switching speed.

Mechanical data

- Case: PDFN5x6-8L, molded plastic.
- Mounting position: Any.

Circuit Diagram

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



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

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	120	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current ($T_C = 25^{\circ}\text{C}$)	I_D	85	A
Peak drain current, pulsed (Note 1)	I_{DM}	250	A
Single pulse avalanche energy (Note 2)	E_{AS}	180	mJ
Power dissipation ($T_C = 25^{\circ}\text{C}$)	P_{tot}	215	W
Thermal resistance junction to case	$R_{\theta JC}$	0.58	$^{\circ}\text{C/W}$
Thermal resistance junction to ambient (Note 3)	$R_{\theta JA}$	50	$^{\circ}\text{C/W}$
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$

Note : 1. Pulse test : pulse width $\leq 100\mu\text{s}$, duty cycle $\leq 0.5\%$, repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^{\circ}\text{C}$.

2. Limited by $T_{J(MAX)}$, starting $T_J = 25^{\circ}\text{C}$.

3. Device mounted on FR-4 substrate PC board, 2oz copper, with 1 inch square copper plate in still air.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV _{DSS}	I _D = 250μA	120			V
Drain-source leakage current	I _{DSS}	V _{DS} = 120V			1	μA
Gate leakage current	I _{GSS}	V _{GS} = ±20V			±100	nA
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.4	1.85	2.4	V
Drain-source on-state resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A		5.8	7	mΩ
		V _{GS} = 4.5V, I _D = 20A		7.1	9	
Dynamic Characteristics						
Forward transconductance	g _{fs}	V _{DS} = 5V, I _D = 20A		83		S
Input capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 60V, f = 1MHz		3295		pF
Output capacitance	C _{oss}			360		
Reverse transfer capacitance	C _{rss}			9		
Total gate charge	Q _g	V _{DS} = 60V, I _D = 20A, V _{GS} = 10V		46		nC
Gate to source charge	Q _{gs}			10		
Gate to drain charge	Q _{gd}			5.5		
Turn-on delay time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 60V, R _G = 3Ω		10		ns
Turn-on rise time	t _r			3.5		
Turn-off delay time	t _{d(off)}			34		
Turn-off fall time	t _f			5.5		
Body-Diode Characteristics						
Drain-source diode forward voltage	V _{SD}	I _S = 1A, V _{GS} = 0V			1	V
Reverse recovery time	t _{rr}	I _{SD} = 20A, di/dt = 100A/μs		43		ns
Reverse recovery charge	Q _{rr}			365		nC

Rating and Characteristic Curves (CMS85N12H8-HF)

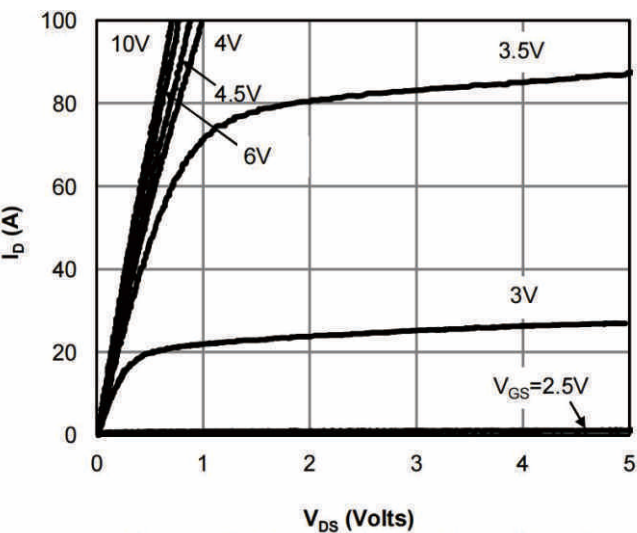


Figure 1: On-Region Characteristics (Note E)

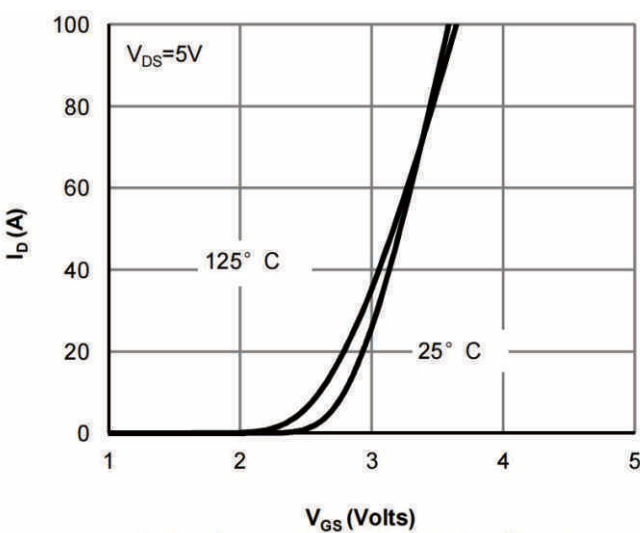


Figure 2: Transfer Characteristics (Note E)

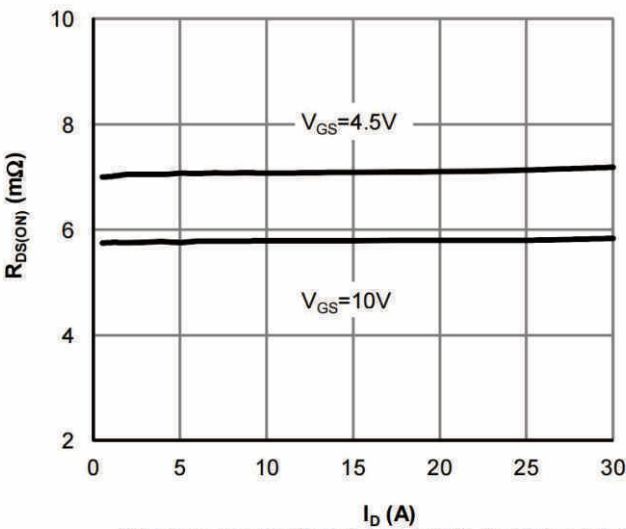


Figure 3: On-Resistance vs. Drain Current and Gate

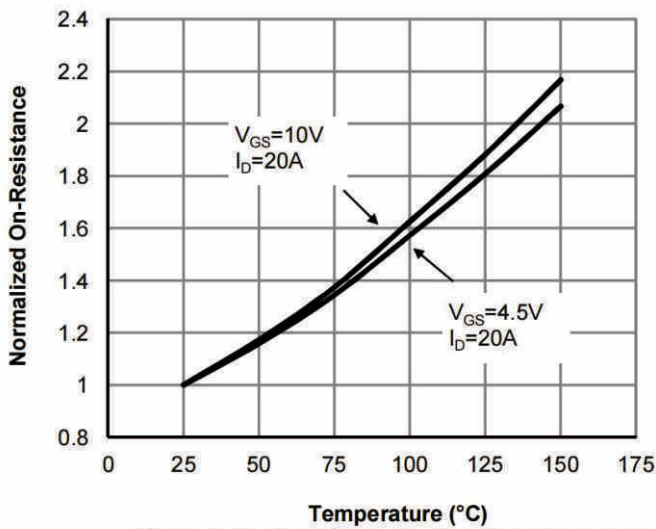


Figure 4: On-Resistance vs. Junction Temperature

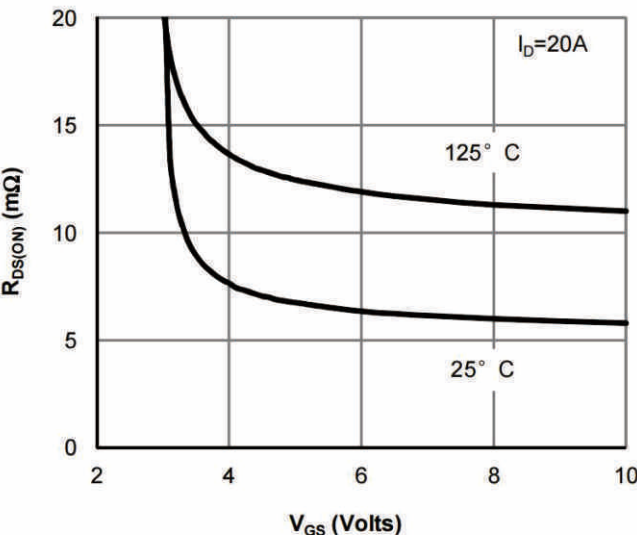


Figure 5: On-Resistance vs. Gate-Source Voltage

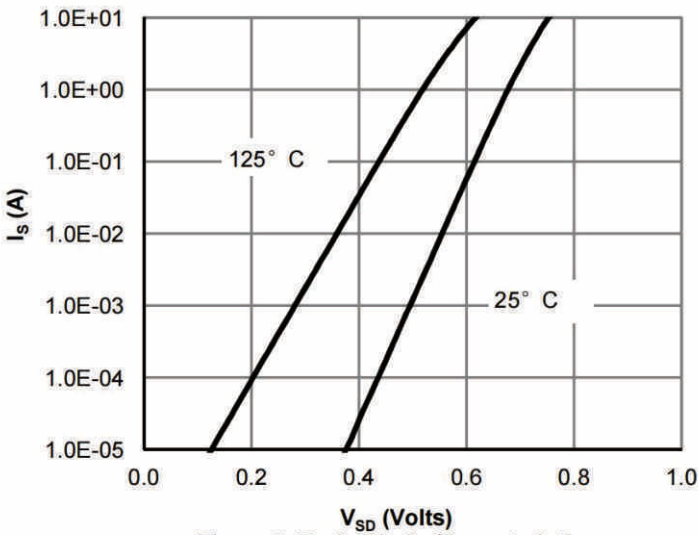


Figure 6: Body-Diode Characteristics

Rating and Characteristic Curves (CMS85N12H8-HF)

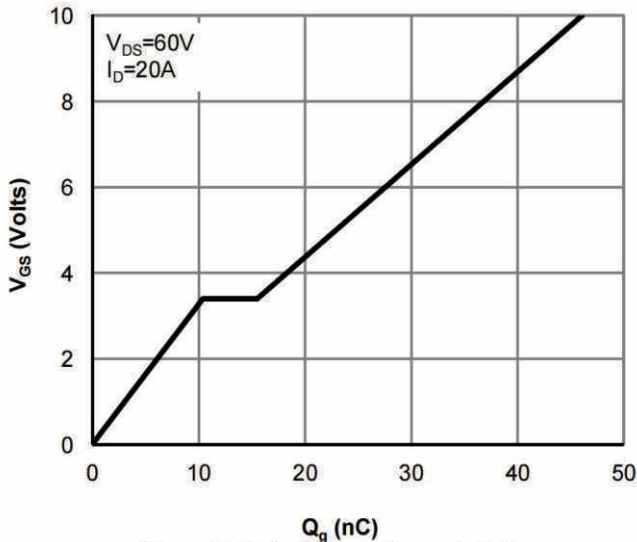


Figure 7: Gate-Charge Characteristics

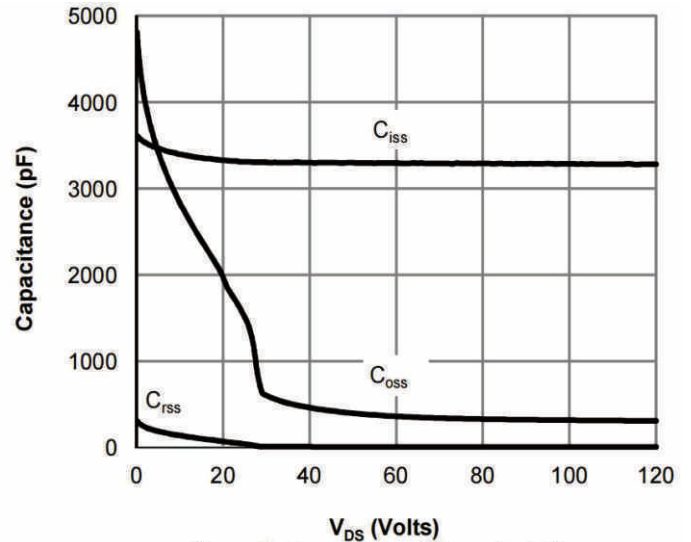


Figure 8: Capacitance Characteristics

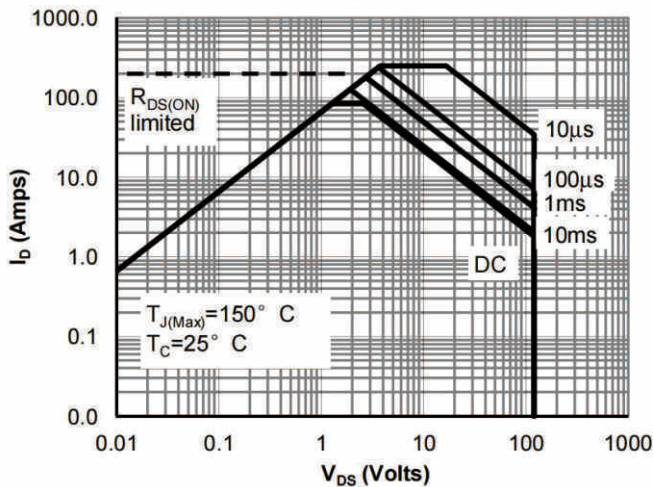


Figure 9: Maximum Forward Biased Safe Operating Area

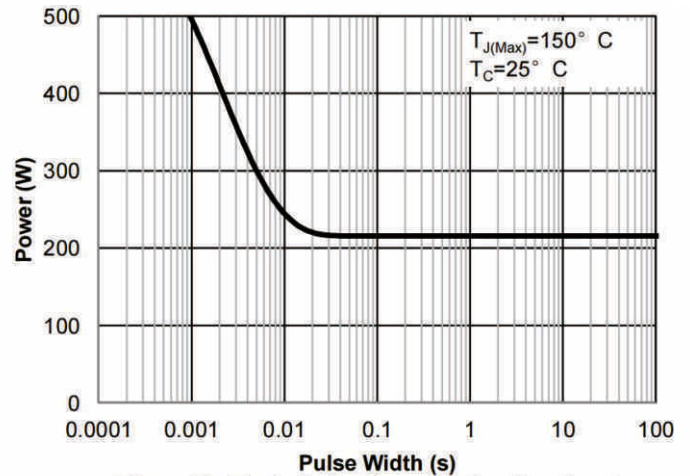


Figure 10: Single Pulse Power Rating Junction-to-Case

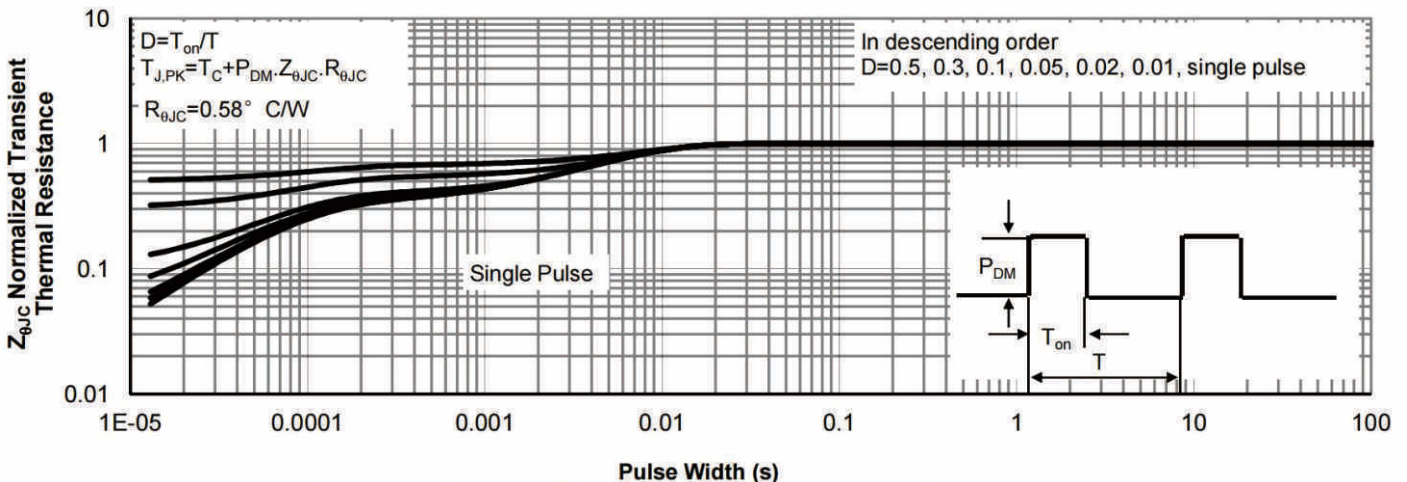


Figure 11: Normalized Maximum Transient Thermal Impedance