

CEM3053-HF

P-Channel

RoHS Device

Halogen Free



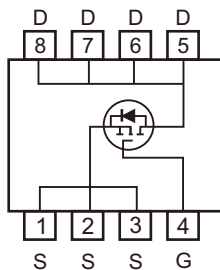
Features

- Simple drive requirement
- Low on-resistance
- Fast switching speed

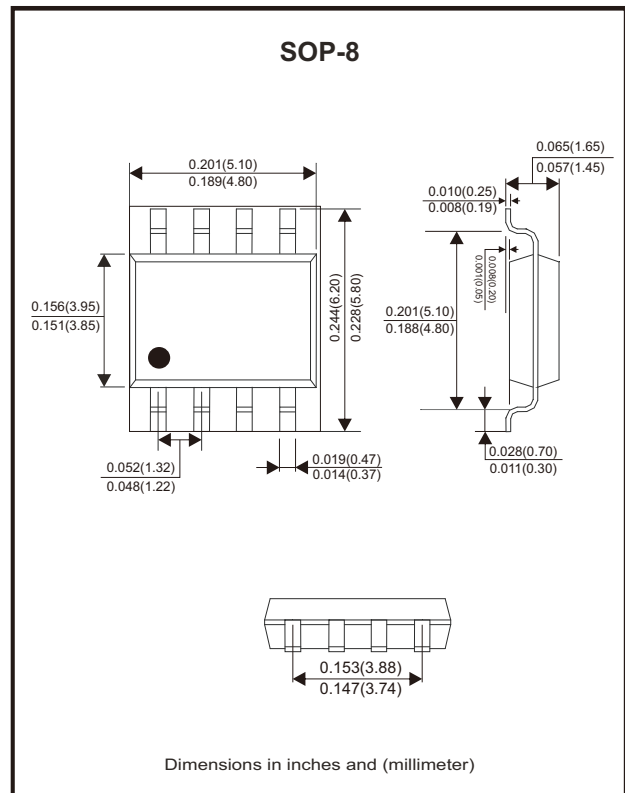
Mechanical data

- Epoxy : UL 94V-0 rated flame retardant.
- Case : SOP-8, molded plastic.
- Lead : Pure tin plated.

Circuit diagram



G : Gate
S : Source
D : Drain



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

Parameter	Symbol	Value	Unit
Drain-source breakdown voltage	BV_{DS}	-30	V
Gate-source voltage	V_{GS}	± 25	V
Continuous drain current @ $T_A=25^{\circ}\text{C}$	I_D	-15	A
Continuous drain current @ $T_A=100^{\circ}\text{C}$	I_D	-9.5	A
Pulsed drain current (Note 1)	I_{DM}	-160	A
Avalanche current	I_{AS}	-15	A
Avalanche energy @ $L=0.1\text{mH}$, $I_D=-15\text{A}$, $R_G=25\Omega$	E_{AS}	11.25	mJ
Power dissipation (Note 2)	P_D	$T_A=25^{\circ}\text{C}$ 3.1	W
		$T_A=100^{\circ}\text{C}$ 1.2	
Operating junction temperature range	T_J	-55 to +150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

Note: 1. Pulse width limited by maximum junction temperature.
2. Surface mounted on 1 in² copper pad of FR-4 board, $t \leq 10\text{s}$.

Company reserves the right to improve product design, functions and reliability without notice.

REV:D

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250μA	-30			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1	-1.5	-2.5	
Gate-source leakage	I _{GSS}	V _{GS} = ±25V, V _{DS} = 0V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = -24V, V _{GS} = 0V			-1	μA
	I _{DSS}	V _{DS} = -20V, V _{GS} = 0V, T _J = 125°C			-10	
Drain-source on-state resistance (Note 1)	R _{DS(on)}	I _D = -15A, V _{GS} = -10V		7.7	9	mΩ
		I _D = -10A, V _{GS} = -4.5V		11.4	18	
		I _D = -10A, V _{GS} = -3V		20.3	40	
Forward transconductance (Note 1)	G _{FS}	V _{DS} = -5V , I _D = -15A		28		S
Dynamic						
Input capacitance	C _{iss}	V _{DS} = -15V, V _{GS} = 0V, f = 1MHz		4022		pF
Output capacitance	C _{oss}			498		
Reverse transfer capacitance	C _{rss}			442		
Turn-on delay time (Note 1&2)	t _{d(on)}	V _{DS} = -15V, V _{GS} = -10V I _D = -15A , R _G = 3Ω		21		nS
Turn-on rise time (Note 1&2)	t _r			19		
Turn-off delay time (Note 1&2)	t _{d(off)}			57		
Turn-off fall time (Note 1&2)	t _f			22		
Total gate charge (Note 1&2)	Q _g	V _{DS} = -15V, I _D = -15A, V _{GS} = 10V		56		nC
Total gate charge (Note 1&2)	Q _g	V _{DS} = -15V, I _D = -15A, V _{GS} = 4.5V		36		
Gate-soutce charge (Note 1&2)	Q _{gs}	V _{DS} = -15V, I _D = -15A, V _{GS} = -10V		15		
Gate-drain charge (Note 1&2)	Q _{gd}			18		
Gate resistance	R _g	V _{GS} = 15mV, V _{DS} = 0, f = 1MHz		3		Ω
Source-Drain Diode						
Continuous souce-drain diode current	I _S				-10	A
Pulse diode forward current (Note 3)	I _{SM}				-40	
Body diode voltage (Note 1)	V _{SD}	I _F = I _S , V _{GS} = 0V		-0.81	-1.2	V
Reverse recovery time	t _{rr}	I _F = -10A, dI _F /dt = 100A/μs		32		nS
Recovered charge	Q _{rr}			26		nC
Source-Drain Diode						
Thermal resistance	R _{θJC}	Junction to case		22	25	°C/W
	R _{θJA}	Junction to ambient (Note 4)		33	40	

- Notes:**
1. Pulse test: Pulse width ≤ 300μs, Duty cycle ≤ 2%
 2. Independent of operating temperature
 3. Pulse width limited by maximum junction temperature.
 4. W width mounted on a 1 in² pad of 2 oz copper, t ≤ 10s; 125°C/W when mounted on minimum copper pad.

RATING AND CHARACTERISTIC CURVES (CEM3053-HF)

Fig.1 - Typical Output Characteristics

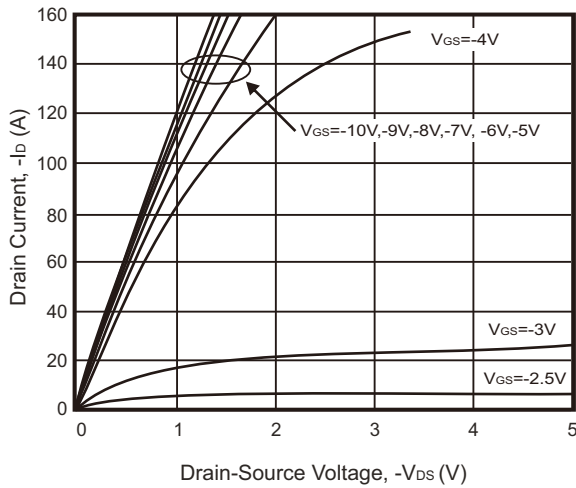


Fig.2 - Static Drain-Source On-State Resistance VS Drain Current

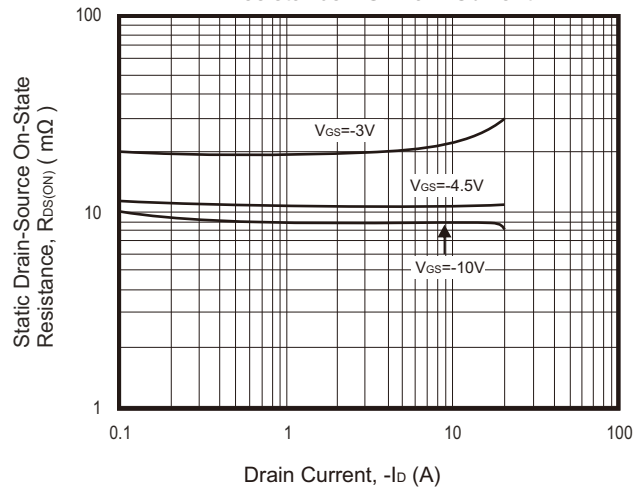


Fig.3 - Static Drain-Source On-State Resistance VS Gate-Source Voltage

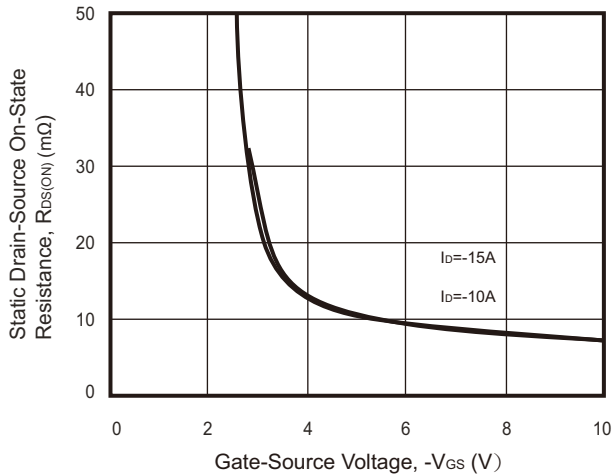


Fig.4 - Capacitance VS Drain-Source Voltage

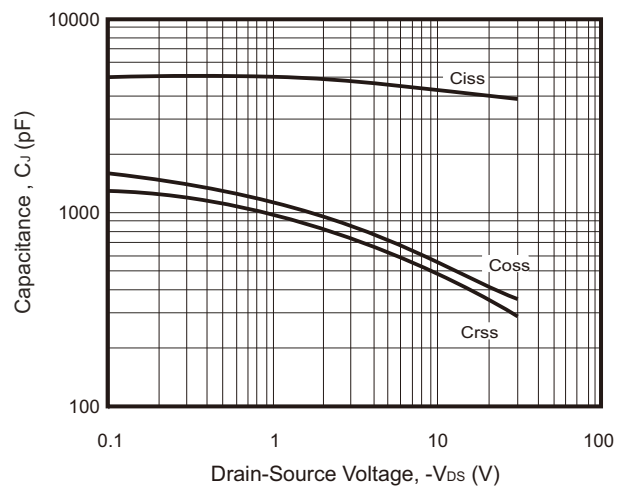


Fig.5 - Forward Transfer Admittance VS Drain Current

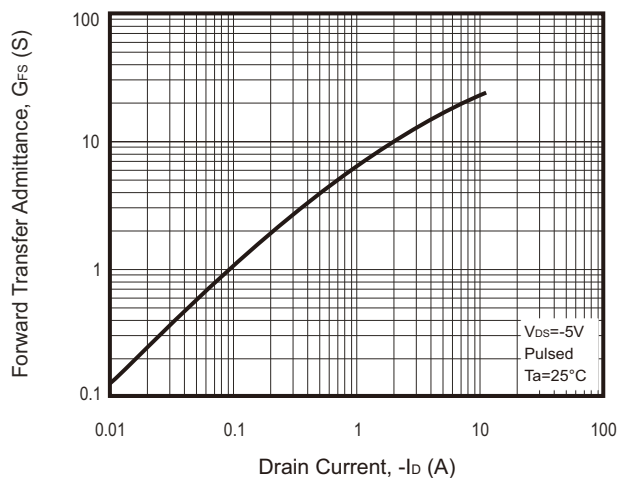
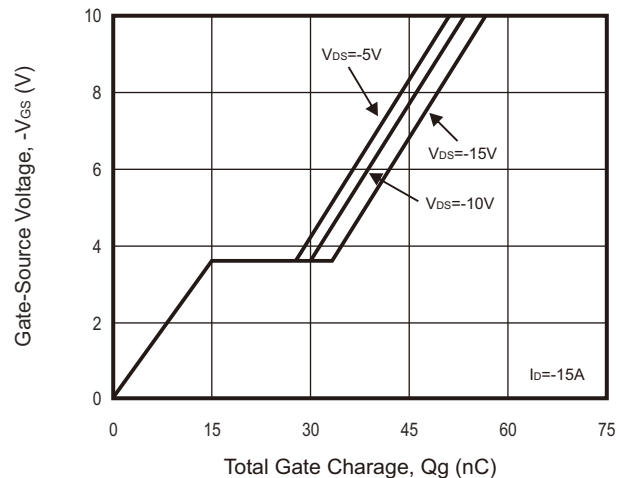
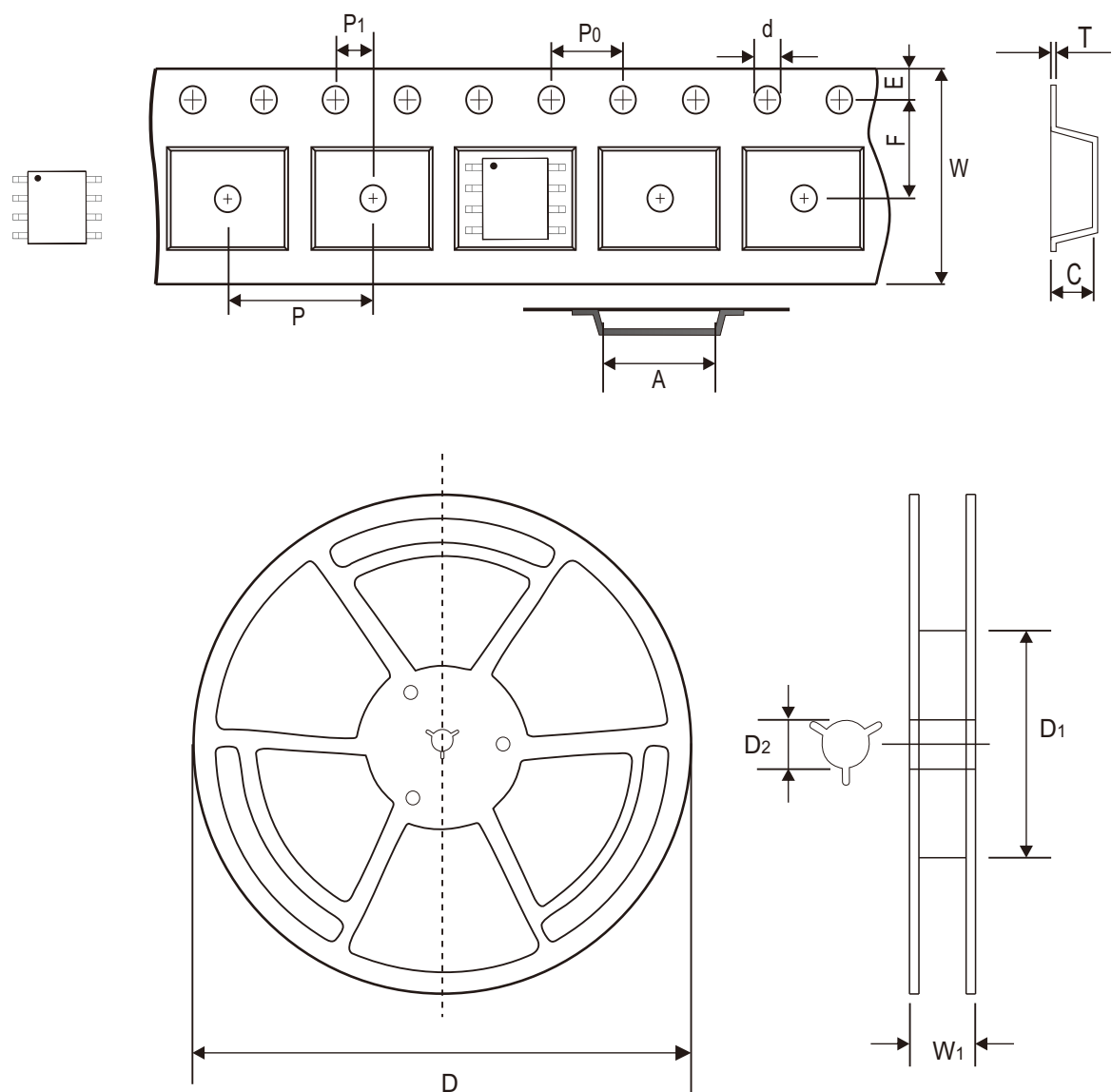


Fig.6 - Gate Charge Characteristics



Reel Taping Specification

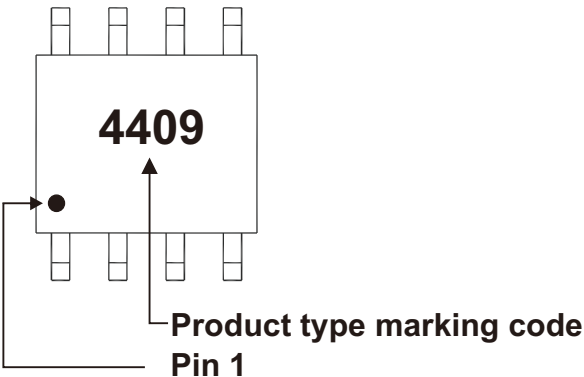


SOP-8	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	6.40 ± 0.10	5.20 ± 0.10	2.10 ± 0.10	1.50 + 0.10 - 0.00	330.00 ± 1.00	100.00 ± 0.50	13.00 ± 0.20
	(inch)	0.252 ± 0.004	0.205 ± 0.004	0.083 ± 0.004	0.059 + 0.004 - 0.000	12.992 ± 0.039	3.937 ± 0.020	0.512 ± 0.008

SOP-8	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	17.60 + 1.00 - 0.00
	(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	0.693 + 0.039 - 0.000

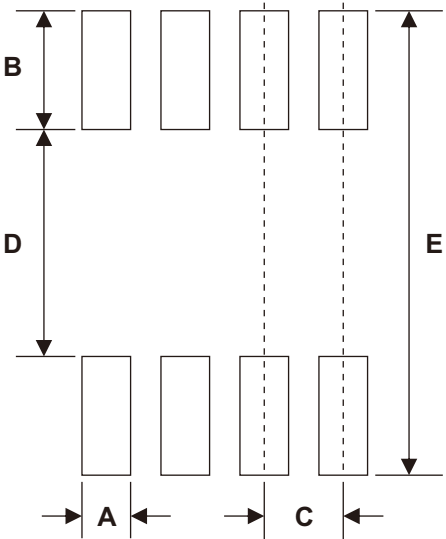
Marking Code

Part Number	Marking Code
CEM3053-HF	4409



Suggested P.C.B. PAD Layout

SIZE	SOP-8	
	(mm)	(inch)
A	0.60	0.024
B	1.52	0.060
C	1.27	0.050
D	4.00	0.157
E	7.00	0.276



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOP-8	4,000	13