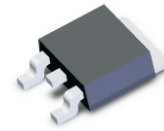


CMS50P04D-HF

P-Channel

RoHS Device

Halogen Free

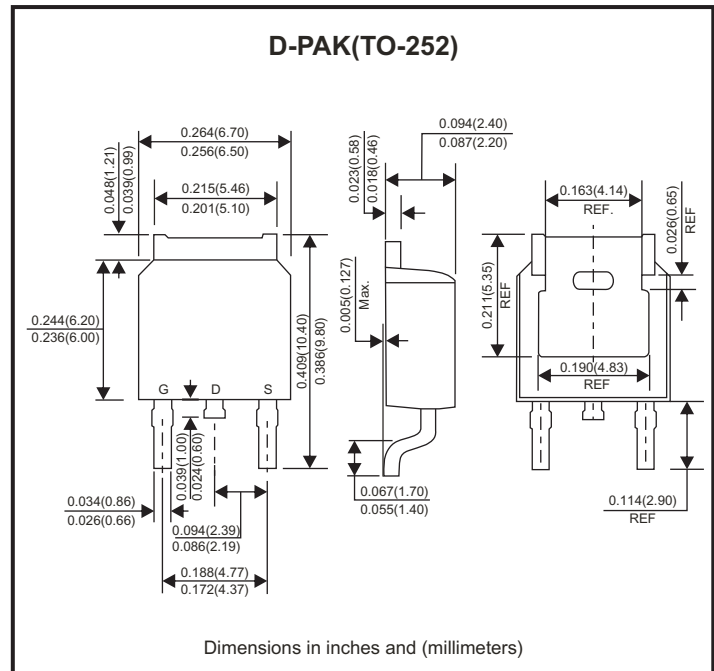
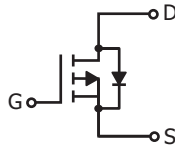


Features

- Single drive requirement
- Low On-resistance
- Fast switching characteristic

Circuit diagram

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



Maximum Ratings (at TA=25 °C unless otherwise noted)

Parameter	Conditions	Symbol	Value	Unit
Drain-source voltage		V_{DS}	-40	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current	$V_{GS} = -10V$, $T_C = 25^\circ C$ (package limited)	I_D	-50	A
	$V_{GS} = -10V$, $T_C = 25^\circ C$ (silicon limited)		-59	
	$V_{GS} = -10V$, $T_C = 100^\circ C$		-37	
	$V_{GS} = -10V$, $T_A = 25^\circ C$		-11	
	$V_{GS} = -10V$, $T_A = 100^\circ C$		-7	
Pulsed drain current	Pulse width limited by safe operating area	I_{DM}	-100	A
Power dissipation	$T_C = 25^\circ C$ (Note 2)	P_D	69	W
	$T_C = 100^\circ C$ (Note 2)		28	
	$T_A = 25^\circ C$		2.5	
	$T_A = 100^\circ C$		1.0	
Single pulse avalanche energy	$T_J = 25^\circ C$, $V_{DD} = -15V$, $L = 1mH$, $R_G = 25\Omega$	E_{AS}	200	mJ
Single pulse avalanche current		I_{AS}	-20	A
Maximum Thermal resistance	Junction to case	$R_{\theta JA}$	1.8	$^\circ C/W$
	Junction to ambient (Note 1)	$R_{\theta JA}$	50	$^\circ C/W$
Operating junction temperature range		T_J	-55 to +150	$^\circ C$
Storage temperature range		T_{STG}	-55 to +150	$^\circ C$

Notes: 1. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with $T_A = 25^\circ C$. The value in any given application depends on the user's specific board design.

2. The power dissipation P_D is more useful in setting the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

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

Electrical Characteristics (at T_J=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	-40			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.2	-2.5	
Forward transconductance	G _{FS}	V _{DS} = -5V, I _D = -25A		42		S
Gate-source leakage	I _{GSS}	V _{GS} = ±20V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = -32V, V _{GS} = 0V			-1	μA
	I _{DSS}	V _{DS} = -32V, V _{GS} = 0V, T _j = 70°C			-25	
Drain-source on-state resistance	* R _{DS(on)}	I _D = -25A, V _{GS} = -10V		9.7	13	mΩ
		I _D = -15A, V _{GS} = -4.5V		12.7	18	
Dynamic						
Total gate charge	* Q _g	V _{DS} = -20V, I _D = -25A, V _{GS} = -10V		40		nC
Gate-source charge	* Q _{gs}			13		
Gate-drain charge	* Q _{gd}			16		
Turn-on delay time	* t _{d(on)}	V _{DS} = -20V, V _{GS} = -10V I _D = -25A, R _g = 6Ω		24		nS
Turn-on rise time	* t _r			15		
Turn-off delay time	* t _{d(off)}			120		
Turn-off fall time	* t _f			40		
Input capacitance	C _{iss}	V _{DS} = -20V , V _{GS} = 0V, f = 1MHz		3987		pF
Output capacitance	C _{oss}			325		
Reverse transfer capacitance	C _{rss}			263		
Source-Drain Diode						
Continuous source-drain diode current	* I _S				-50	A
Diode forward voltage	* V _{SD}	V _{GS} = 0V, I _S = -25A		-0.9	-1.2	V
Reverse recovery time	* t _{rr}	I _F = -25A ,V _{GS} = 0V		36		nS
Reverse recovery charge	* Q _{rr}	dI _F /dt = 100A/μs		32		nC

*Pulse test: Pulse width ≤ 300μs, Duty cycle ≤ 2%

RATING AND CHARACTERISTIC CURVES (CMS50P04D-HF)

Fig.1 - Typical Output Characteristics

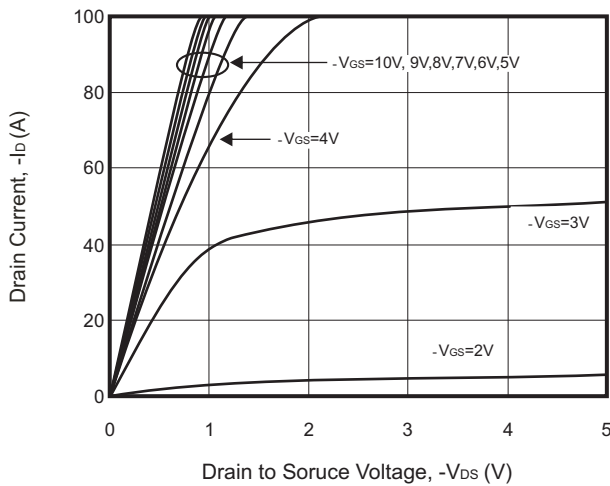


Fig.2 - Static Drain-Source On-State Resistance VS Drain Current

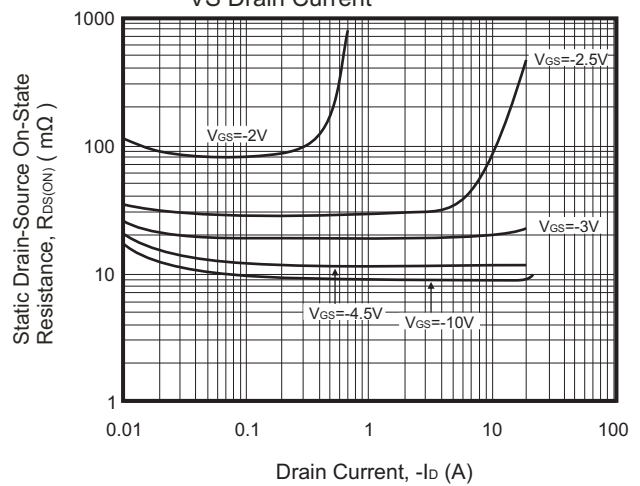


Fig.3 - Static Drain-Source On-State Resistance VS. Gate-Source Voltage

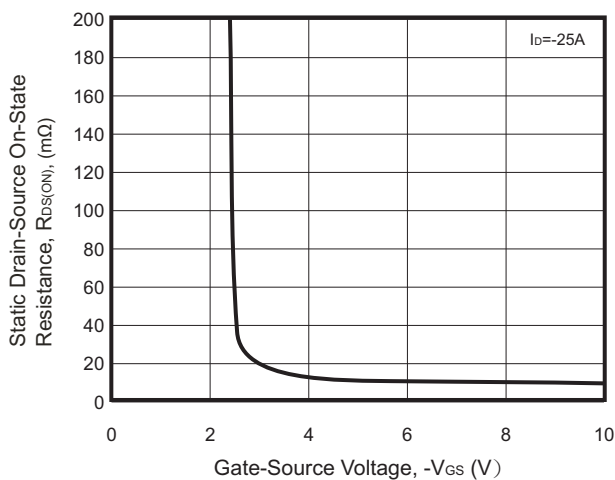


Fig.4 - Capacitance VS Drain-to-Source Voltage

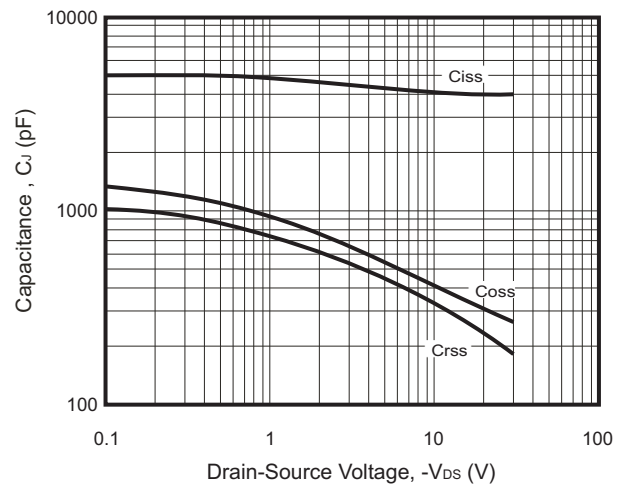


Fig.5 - Forward Transfer Admittance vs Drain Current

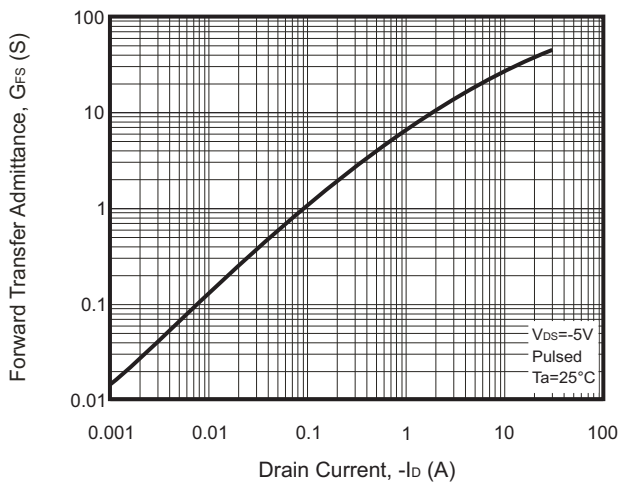
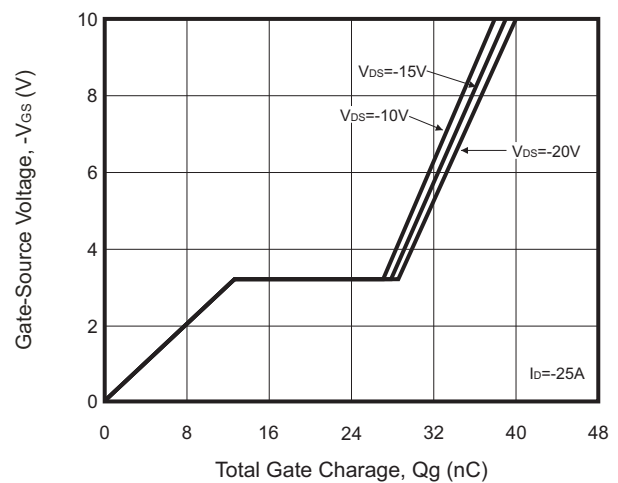
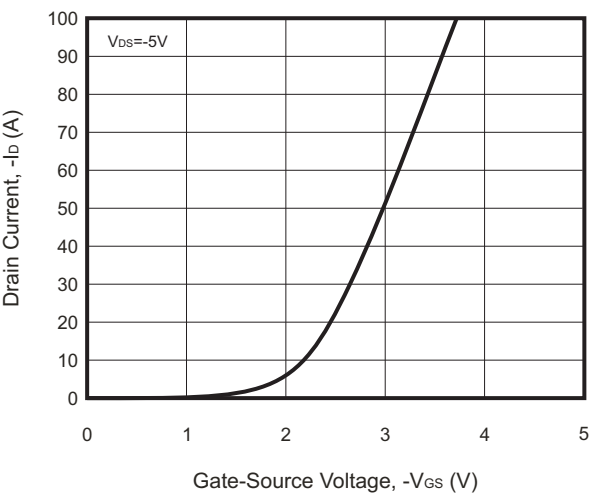


Fig.6 - Gate Charge Characteristics

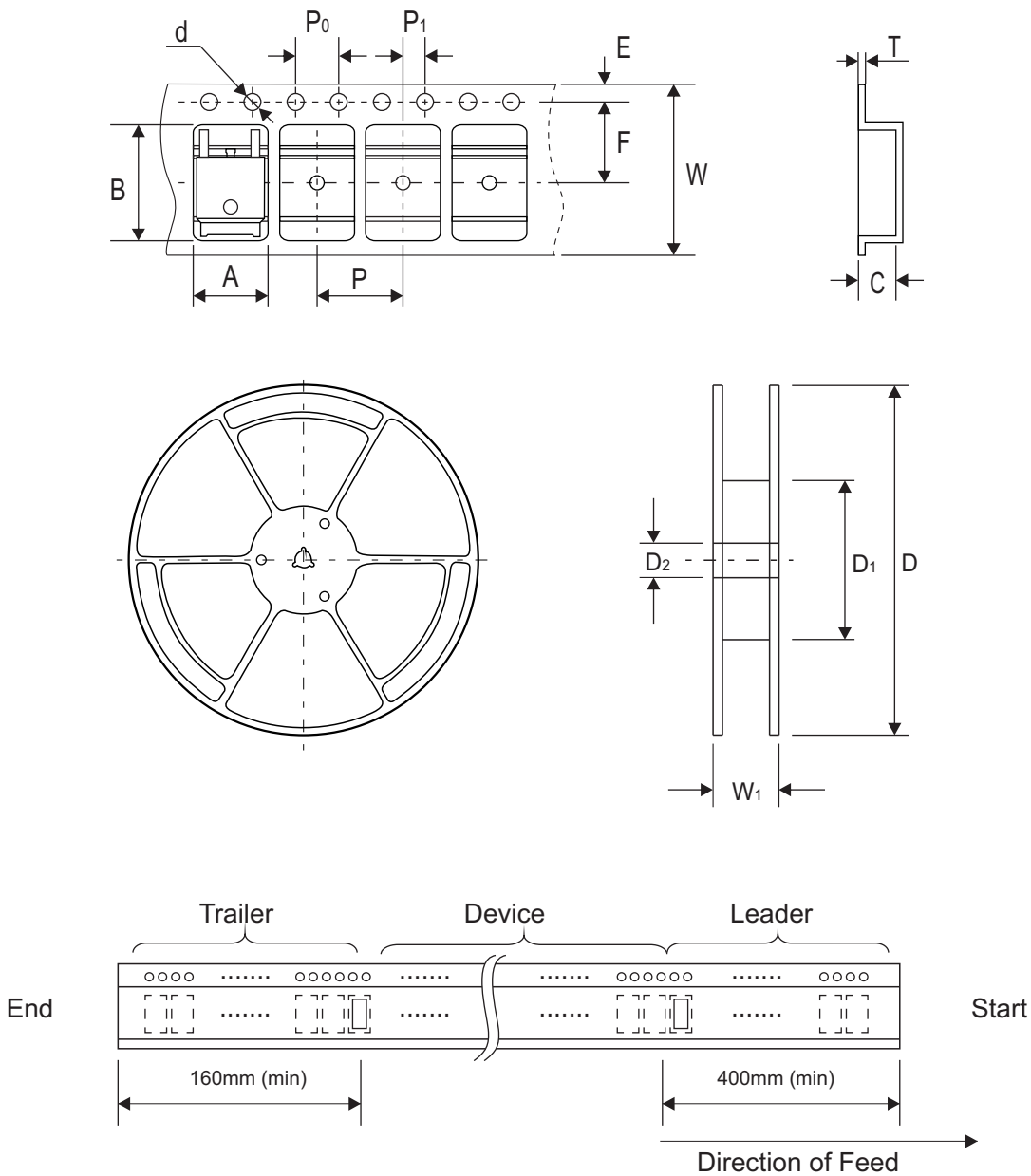


RATING AND CHARACTERISTIC CURVES (CMS50P04D-HF)

Fig.7 - Typical Transfer Characteristics



Reel Taping Specification

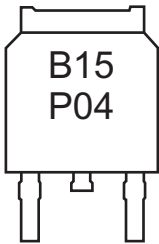


TO-252 (D-PAK)	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	6.90 ± 0.10	10.50 ± 0.10	2.70 ± 0.10	1.55 ± 0.05	330.00 ± 2.00	100.00 ± 1.00	13.00 ± 1.00
	(inch)	0.272 ± 0.004	0.413 ± 0.004	0.106 ± 0.004	0.061 ± 0.002	12.992 ± 0.079	3.937 ± 0.039	0.512 ± 0.039

TO-252 (D-PAK)	SYMBOL	E	F	P	P ₀	P ₁	T	W	W ₁
	(mm)	1.75 ± 0.10	7.50 ± 0.10	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	0.30 ± 0.05	16.00 ± 0.10	21.00 ± 1.00
	(inch)	0.069 ± 0.004	0.295 ± 0.004	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.012 ± 0.002	0.630 ± 0.004	0.827 ± 0.039

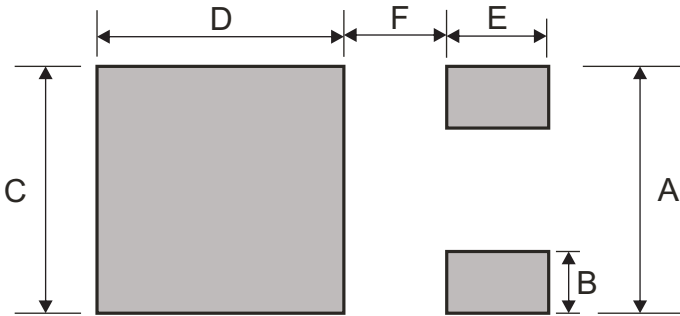
Marking Code

Part Number	Marking Code
CMS50P04D-HF	B15P04



Suggested PAD Layout

SIZE	TO-252 / DPAK	
	(mm)	(inch)
A	6.17	0.243
B	1.60	0.063
C	5.80	0.228
D	6.20	0.244
E	3.00	0.118
F	2.58	0.101



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	REEL SIZE (inch)
TO-252/D-PAK	2,500	13

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