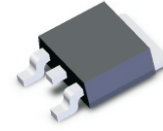


CMS50P04D-HF

P-Channel
RoHS Device
Halogen Free

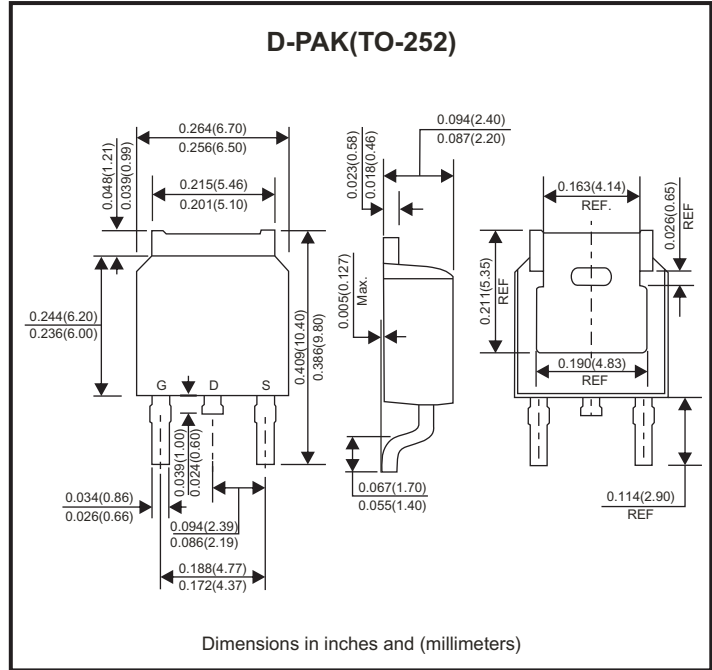
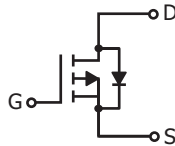


Features

- 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 determined the current rating , when this rating falls below the package limit.

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

REV:A

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/dt = 100A/μs		32		nC

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

RATING AND CHARACTERISTIC CURVES (CMS50P04D-HF)

Fig.1 - Typical Output Characteristics

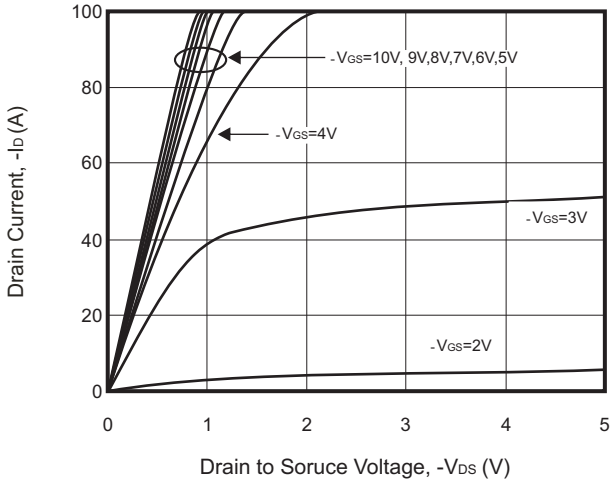


Fig.2 - Static Drain-Source On-State Resistance VS Drain Current

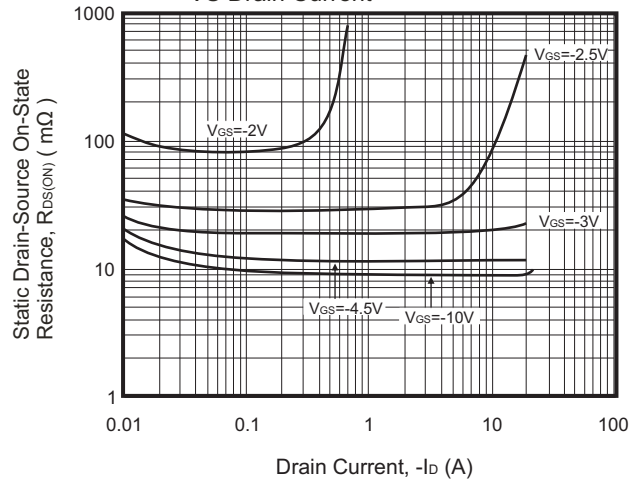


Fig.3 - Static Drain-Source On-State Resistance VS. Gate-Source Voltage

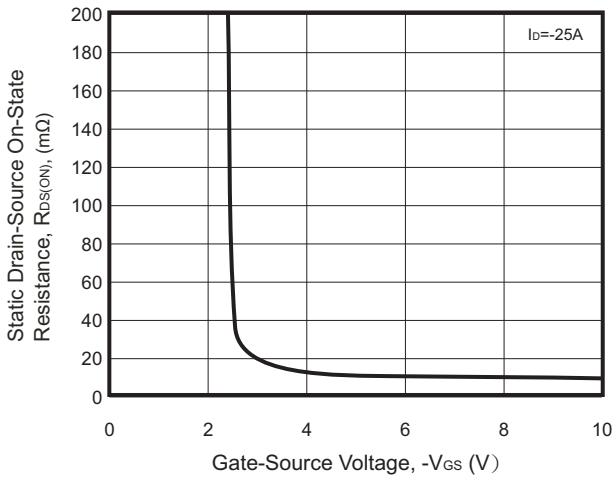


Fig.4 - Capacitance VS Drain-to-Source Voltage

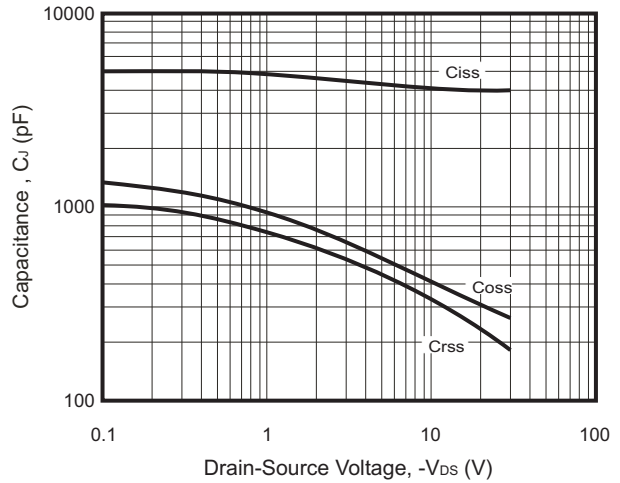


Fig.5 - Forward Transfer Admittance vs Drain Current

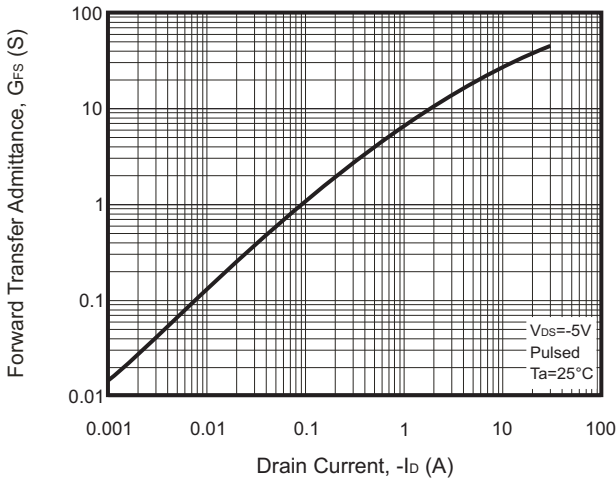
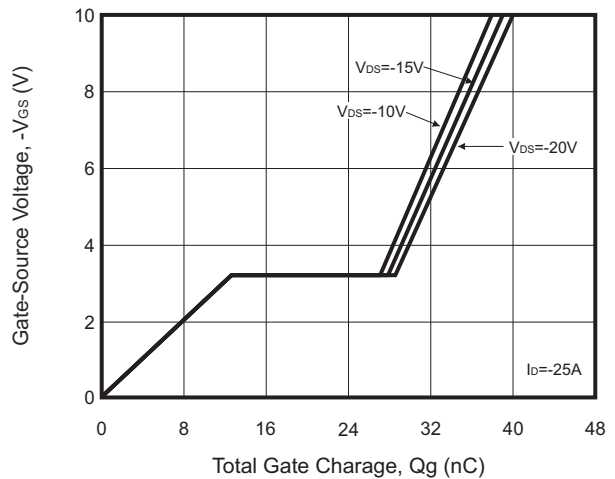
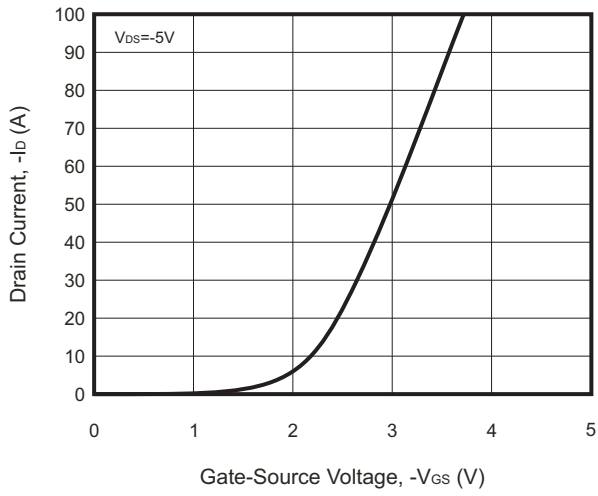


Fig.6 - Gate Charge Characteristics

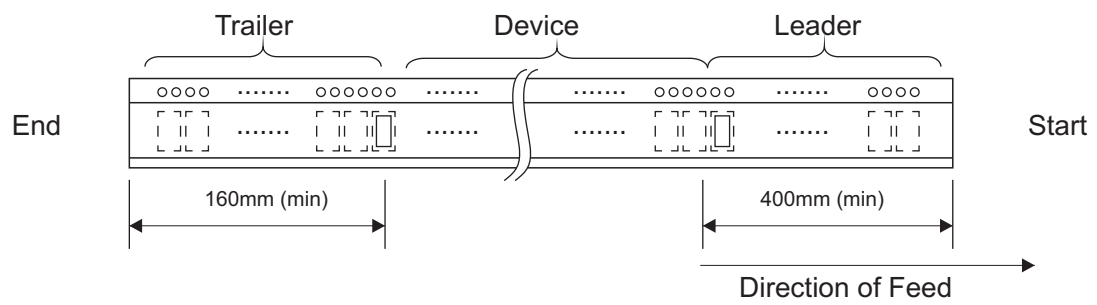
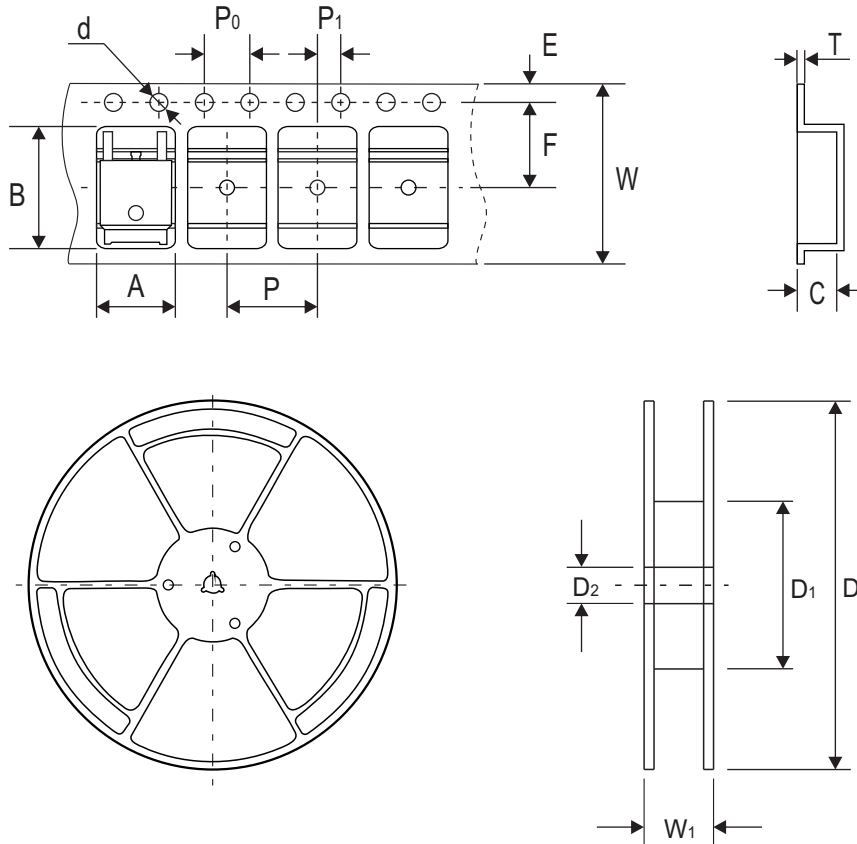


RATING AND CHARACTERISTIC CURVES (CMS50P04D-HF)

Fig.7 - Typical Transfer Characteristics



Reel Taping Specification

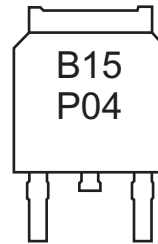


TO-252 (D-PAK)	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	6.90 ± 0.10	10.50 ± 0.10	2.70 ± 0.10	1.55 ± 0.05	330.00 ± 2.00	100.00 ± 1.00	13.00 ± 1.00
	(inch)	0.272 ± 0.004	0.413 ± 0.004	0.106 ± 0.004	0.061 ± 0.002	12.992 ± 0.079	3.937 ± 0.039	0.512 ± 0.039

TO-252 (D-PAK)	SYMBOL	E	F	P	P0	P1	T	W	W1
	(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

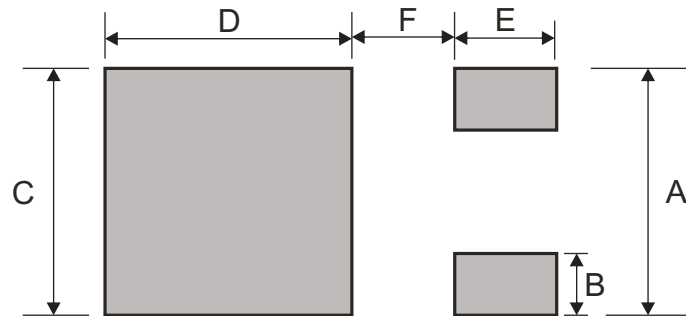
Marking Code

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