

### General Description

These P-Channel enhancement mode power field effect transistors use advanced trench technology and design to provide excellent RDS(ON) . This device is suitable for use as a load switch or in PWM applications.

### Features

- Fast switching speed
- Lower On-resistance
- 100% EAS Guaranteed
- Simple Drive Requirement

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-40	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	-90	A
$I_{DM}$	Pulsed Drain Current	-270	A
EAS	Single Pulse Avalanche Energy	583	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	150	W
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 175	$^\circ C$

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Junction-to-Ambient	---	62.5	$^\circ C/W$
$R_{\theta JC}$	Junction-to-Case (Drain)	---	1.0	$^\circ C/W$

### Product Summary

BVDSS	RDSON	ID
-40V	6.8m $\Omega$	-90A

### Applications

- DC-DC Converters
- Load Switches
- BLDC Motor driver

### TO-252 / 251 Pin Configuration



Type	Package	Marking
CMD90P04B	TO-252	CMD90P04B
CMU90P04B	TO-251	CMU90P04B

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-20A$	---	---	6.8	m $\Omega$
		$V_{GS}=-4.5V, I_D=-15A$	---	---	8.5	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.0	---	-2.0	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=-32V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=-5V, I_D=-10A$	---	42	---	S
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	2.2	---	$\Omega$
$Q_g$	Total Gate Charge	$V_{DS}=-20V, I_D=-20A$ $V_{GS}=-10V$	---	58	---	nC
$Q_{gs}$	Gate-Source Charge		---	10	---	
$Q_{gd}$	Gate-Drain Charge		---	8	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=-20V, V_{GS}=-10V, R_{GS}=1.6\Omega$ $I_D=-20A$	---	11	---	ns
$T_r$	Rise Time		---	5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	36	---	
$T_f$	Fall Time		---	6	---	
$C_{iss}$	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$	---	7500	---	pF
$C_{oss}$	Output Capacitance		---	882	---	
$C_{rss}$	Reverse Transfer Capacitance		---	22	---	

### Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V$ , Force Current	---	---	-90	A
$I_{SM}$	Pulsed Source Current		---	---	-270	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_F=-20A$	---	---	-1.2	V

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