

# MOSFET MODULE

## FCA50CC50



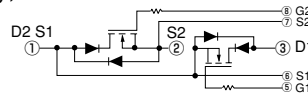
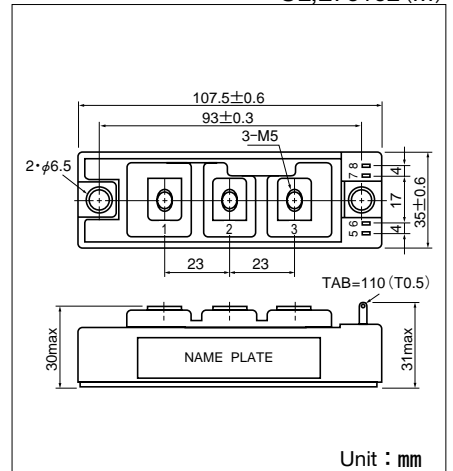
UL;E76102 (M)

**FCA50CC50** is a dual power MOSFET module designed for fast switching applications of high voltage and current. (2 devices are serial connected with a fast recovery diode ( $t_{rr} \leq 100\text{ns}$ ) reverse connected across each MOSFET.) The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction.

- $I_D = 50\text{A}$ ,  $V_{DS} = 500\text{V}$
- Suitable for high speed switching applications.
- Low ON resistance.
- Wide Safe Operating Areas.
- $t_{rr} \leq 100\text{ns}$  fast recovery diode for free wheel.

**(Applications)**

UPS (CVCF), Motor Control, Switching Power Supply, etc.



■ **Maximum Ratings**

( $T_j = 25^\circ\text{C}$  unless otherwise specified)

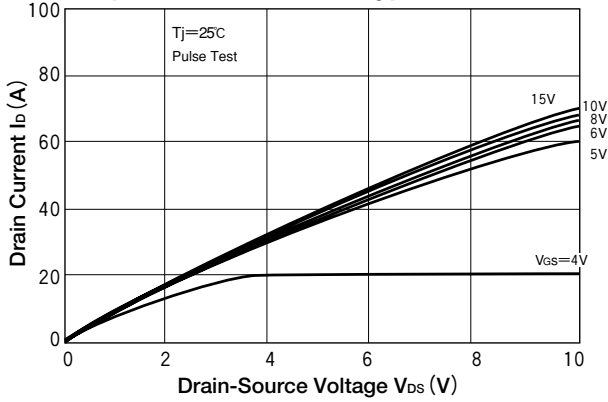
Symbol	Item		Conditions	Ratings		Unit
				FCA50CC50		
$V_{DS}$	Drain-Source Voltage			500		V
$V_{GS}$	Gate-Source Voltage			$\pm 20$		V
$I_D$	Drain Current	DC	Duty 55%	50		A
$I_{DP}$		Pulse		100		
$-I_D$	Source Current			50		A
$P_T$	Total Power Dissipation		$T_c = 25^\circ\text{C}$	330		W
$T_j$	Channel Temperature			-40 to +150		$^\circ\text{C}$
$T_{stg}$	Storage Temperature			-40 to +125		$^\circ\text{C}$
$V_{iso}$	Isolation Voltage (R.M.S.)		A.C. 1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)		N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)		
	Mass		Typical Value	240		g

■ **Electrical Characteristics**

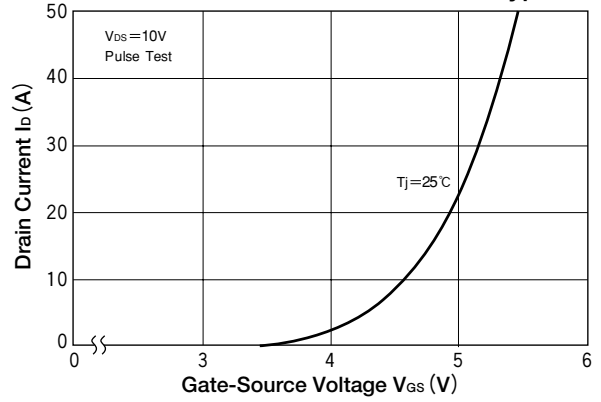
( $T_j = 25^\circ\text{C}$  unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
$I_{GSS}$	Gate Leakage Current		$V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$			$\pm 1.0$	$\mu\text{A}$
$I_{DSS}$	Zero Gate Voltage Drain Current		$V_{GS} = 0\text{V}$ , $V_{DS} = 500\text{V}$			1.0	mA
$V_{(BR)DS}$	Drain-Source Breakdown Voltage		$V_{GS} = 0\text{V}$ , $I_D = 1\text{mA}$	500			V
$V_{GS(th)}$	Gate-Source Threshold Voltage		$V_{DS} = V_{GS}$ , $I_D = 10\text{mA}$	1.0		5.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance		$I_D = 25\text{A}$ , $V_{GS} = 15\text{V}$			140	m $\Omega$
$V_{DS(on)}$	Drain-Source On-State Voltage		$I_D = 25\text{A}$ , $V_{GS} = 15\text{V}$			3.5	V
$g_{fs}$	Forward Transconductance		$V_{DS} = 10\text{V}$ , $I_D = 25\text{A}$		30		S
$C_{iss}$	Input Capacitance		$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1.0\text{MHz}$			10000	pF
$C_{oss}$	Output Capacitance		$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1.0\text{MHz}$			1900	pF
$C_{rss}$	Reverse Transfer Capacitance		$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1.0\text{MHz}$			750	pF
$t_{d(on)}$	Switching Time	Turn-on Delay Time	$V_{DD} = 300\text{V}$ , $V_{GS} = 15\text{V}$ $I_D = 25\text{A}$ , $R_G = 5\Omega$		60		ns
$t_r$		Rise Time			100		
$t_{d(off)}$		Turn-off Delay Time			520		
$t_f$		Fall Time			140		
$V_{SDS}$	Diode Forward Voltage		$I_S = 25\text{A}$ , $V_{GS} = 0\text{V}$			2.0	V
$t_{rr}$	Reverse Recovery Time		$I_S = 25\text{A}$ , $V_{GS} = -5\text{V}$ , $di/dt = 100\text{A}/\mu\text{s}$		80	100	ns
$R_{th(j-c)}$	Thermal Resistance		MOSFET			0.38	$^\circ\text{C}/\text{W}$
			Diode			1.67	

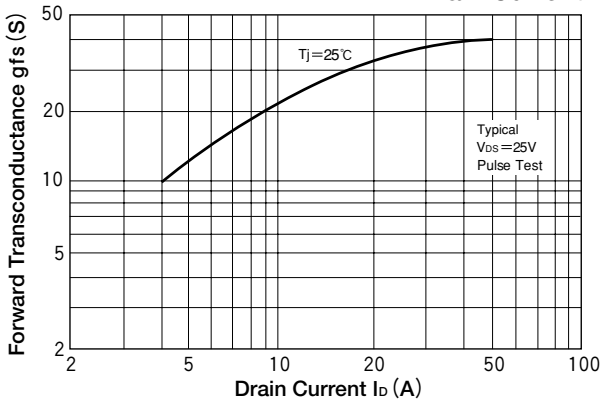
### Output Characteristics (Typical)



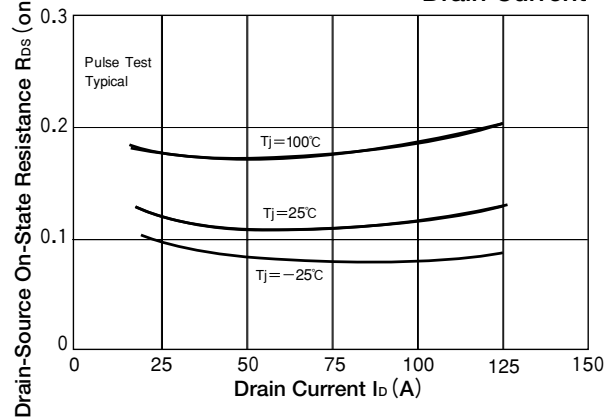
### Forward Transfer Characteristics (Typical)



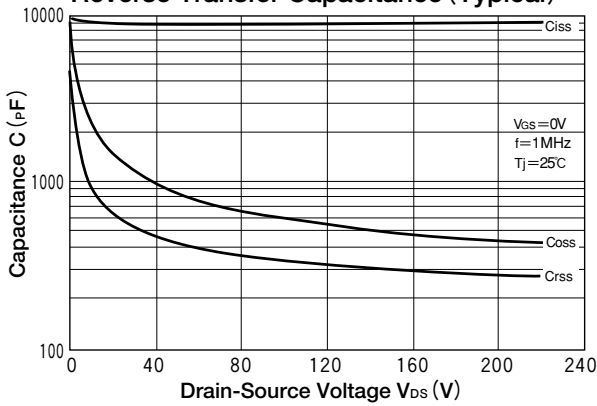
### Forward Transconductance Vs. Drain Current



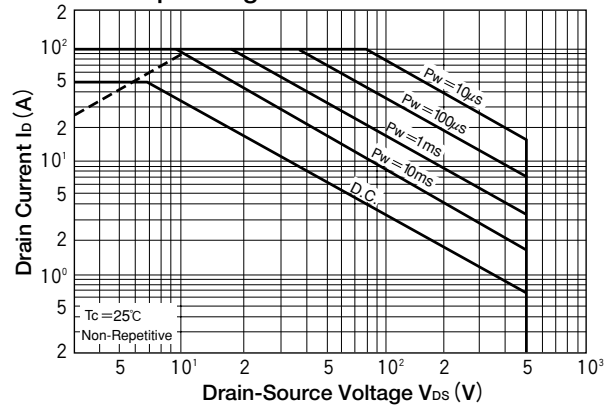
### Drain-Source On-State Resistance Vs. Drain Current



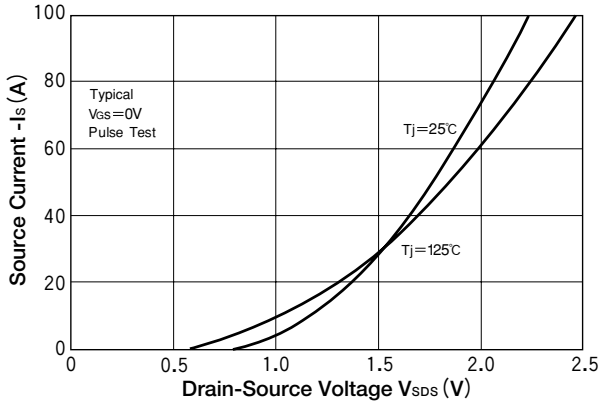
### Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



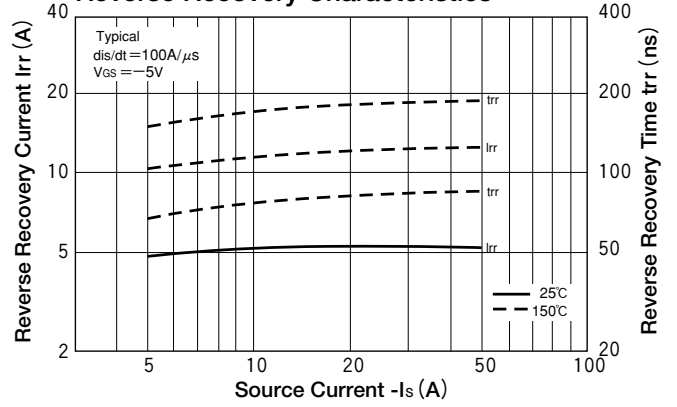
### Safe Operating Area



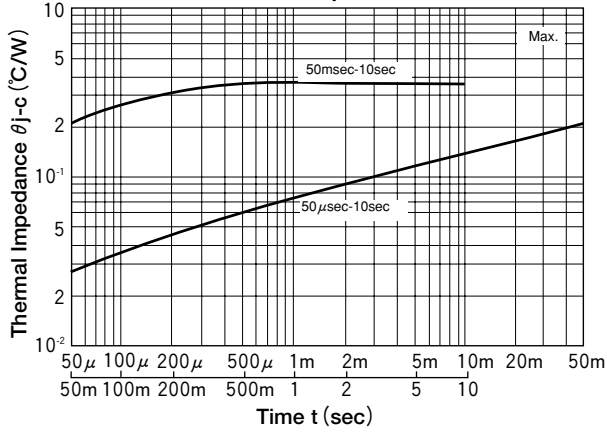
### Forward Voltage of Free Wheeling Diode



### Reverse Recovery Characteristics



### Transient Thermal Impedance (MOSFET)



### Transient Thermal Impedance (DIODE)

