



Micro Commercial Components



Micro Commercial Components
 20736 Marilla Street Chatsworth
 CA 91311
 Phone: (818) 701-4933
 Fax: (818) 701-4939

MCMNP517

N and P-Channel Enhancement Mode Field Effect Transistor

Features

- Halogen free available upon request by adding suffix "-HF"
- Super High Density Cell Design for Extremely Low $R_{DS(ON)}$
- Lead Free Finish/Rohs Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking:517

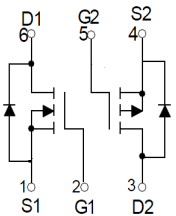
Maximum ratings ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	12	-12	V
Gate-Source Voltage	V_{GS}	± 12	± 12	V
Continuous Drain Current (NOTE1)	I_D	6.0	-4.1	A
Pulsed Drain Current	I_{DM}	24	-16.4	A
Continous Source-Drain Diode Current	I_S	6	-4.1	A
Thermal Resistance from Junction to Ambient (NOTE1)	$R_{\theta JA}$	167		$^\circ\text{C/W}$
Operating Junction Temperature	T_J	150		$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150		$^\circ\text{C}$

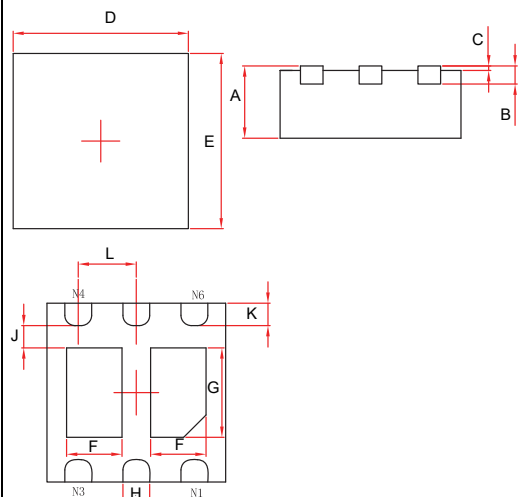
Notes :

1. Surface mounted on FR4 board using the minimum recommended pad size.

Equivalent Circuit



DFN2020-6U



DIM	Dimensions				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.028	.035	0.700	0.900	
B	0.008REF.		0.203REF.		
C	0.000	0.002	0.000	0.050	
D	0.076	0.082	1.924	2.076	
E	0.076	0.082	1.924	2.076	
F	0.020	0.028	0.520	0.720	
G	0.035	0.043	0.900	1.100	
H	0.010	0.014	0.250	0.350	
J	0.008	---	0.200	---	
K	0.007	0.013	0.174	0.326	
L	0.026TYP.		0.650TYP.		

MOSFET ELECTRICAL CHARACTERISTICS

N-ch MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERISTICS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	12			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 16V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage (note 2)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5		1	V
Drain-source on-resistance(note 2)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 6A$			24	m Ω
		$V_{GS} = 4.5V, I_D = 5A$			27	m Ω
		$V_{GS} = 2.5V, I_D = 4A$			42	m Ω
		$V_{GS} = 1.8V, I_D = 2A$			74	m Ω
Forward tranconductance(note 2)	g_{FS}	$V_{DS} = 5V, I_D = 3.8A$	4			S
Diode forward voltage	V_{SD}	$I_S = 1A, V_{GS} = 0V$			1	V
DYNAMIC CHARACTERISTICS (note 4)						
Input Capacitance	C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		630		pF
Output Capacitance	C_{oss}			164		pF
Reverse Transfer Capacitance	C_{rss}			137		pF
SWITCHING CHARACTERISTICS (note 3,4)						
Turn-on delay time	$t_{d(on)}$	$V_{GS} = 5V, V_{DS} = 10V,$ $R_{GEN} = 6\Omega, R_L = 1.7\Omega$		5.5		ns
Turn-on rise time	t_r			14		ns
Turn-off delay time	$t_{d(off)}$			29		ns
Turn-off fall time	t_f			10.2		ns
Total Gate Charge	Q_g	$V_{DS} = 10V, I_D = 6A,$ $V_{GS} = 10V$		12		nC
Gate-Source Charge	Q_{gs}			1		nC
Gate-Drain Charge	Q_{gd}			2		nC

P-ch MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERISTICS						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-12			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -8V, V _{GS} = 0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±8V, V _{DS} = 0V			±100	nA
Gate threshold voltage (note 2)	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.5		-0.9	V
Drain-source on-resistance(note 2)	R _{DS(on)}	V _{GS} = -4.5V, I _D = -3.5A			45	mΩ
		V _{GS} = -2.5V, I _D = -3A			60	mΩ
		V _{GS} = -1.8V, I _D = -2A			90	mΩ
Forward tranconductance(note 2)	g _{FS}	V _{DS} = -5V, I _D = -4.1A	6			S
Diode forward voltage	V _{SD}	I _S = -3.3A, V _{GS} = 0V			-1.2	V
DYNAMIC CHARACTERISTICS (note 4)						
Input Capacitance	C _{ISS}	V _{DS} = -4V, V _{GS} = 0V, f = 1MHz		740		pF
Output Capacitance	C _{OSS}			290		pF
Reverse Transfer Capacitance	C _{rss}			190		pF
SWITCHING CHARACTERISTICS (note 3,4)						
Turn-on delay time	t _{d(on)}	V _{GEN} = -4.5V, V _{DD} = -4V, I _D = -3.3A, R _G = 1Ω , R _L = 1.2Ω			20	ns
Turn-on rise time	t _r				53	ns
Turn-off delay time	t _{d(off)}				48	ns
Turn-off fall time	t _f				20	ns
Total Gate Charge	Q _g	V _{DS} = -4V, I _D = -4.1A, V _{GS} = -2.5V			9	nC
Gate-Source Charge	Q _{gs}			1.2		nC
Gate-Drain Charge	Q _{gd}			1.6		nC

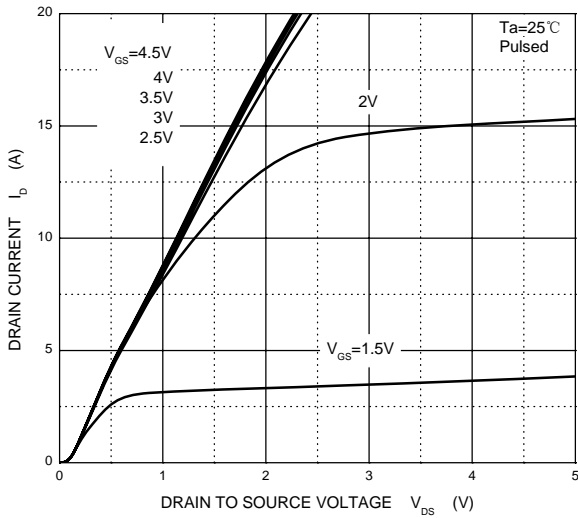
Notes :

- Pulse Test: Pulse width = 300μs, duty cycle ≤ 2%.
- Switching characteristics are independent of operating junction temperature.
- Garanted by design, not subject to producing.

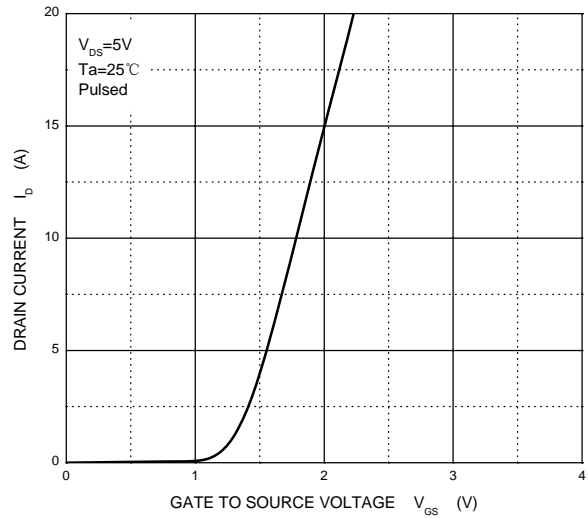
Typical Characteristics

N-Channel MOS

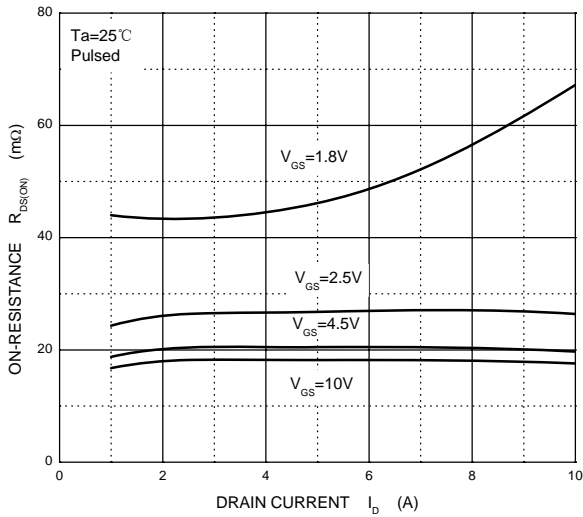
Output Characteristics



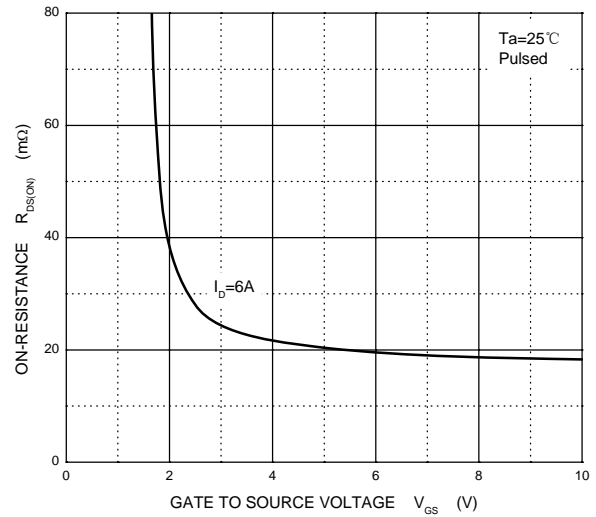
Transfer Characteristics



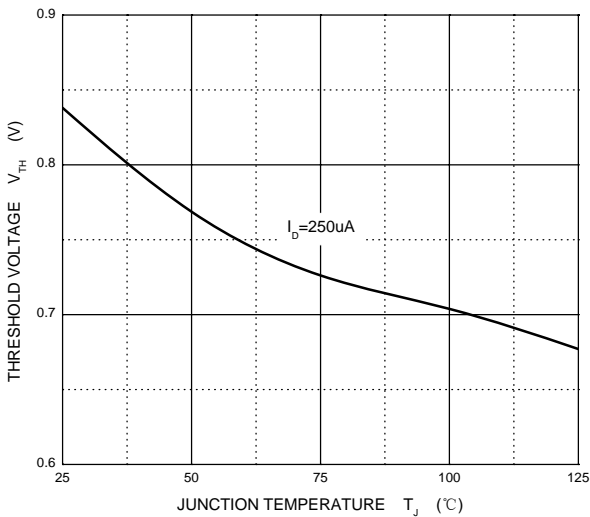
$R_{DS(ON)}$ — I_D



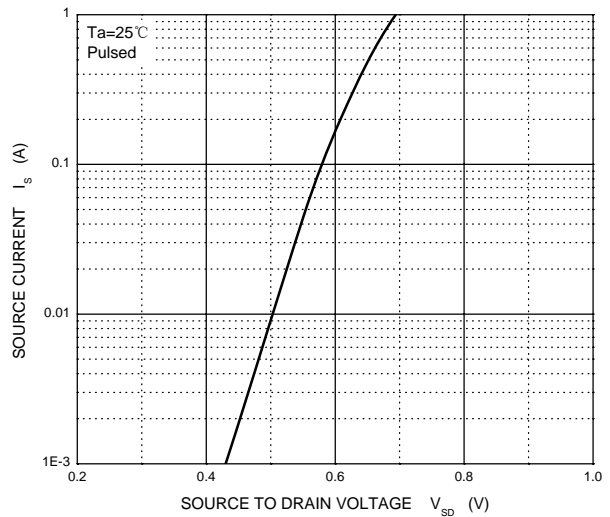
$R_{DS(ON)}$ — V_{GS}



Threshold Voltage



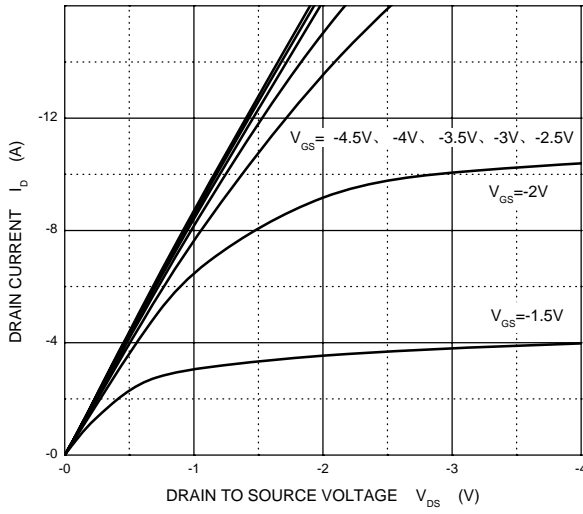
I_S — V_{SD}



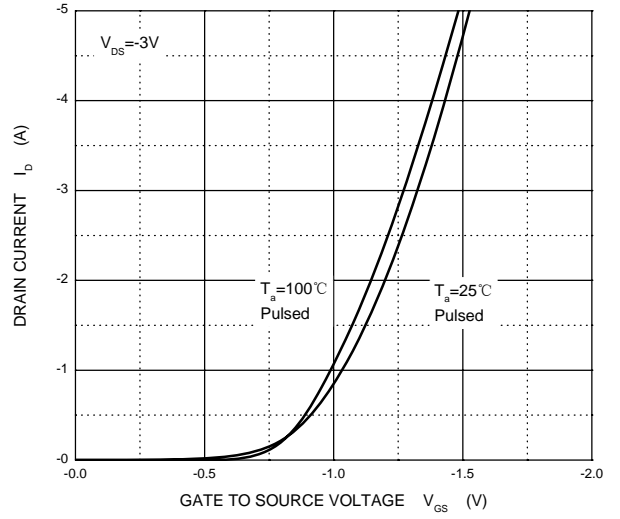
P-Channel MOS

-16

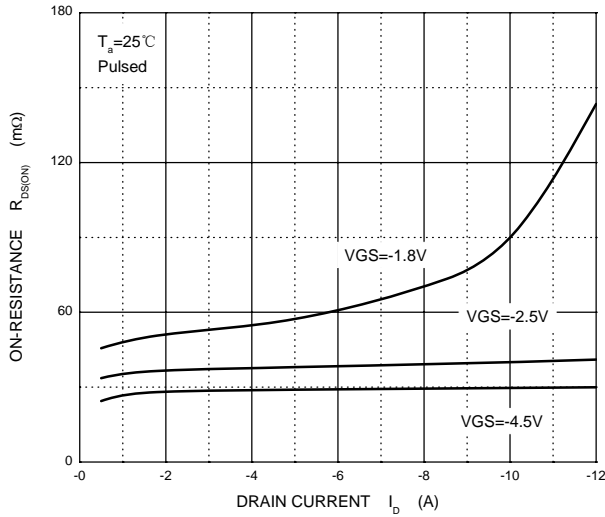
Output Characteristics



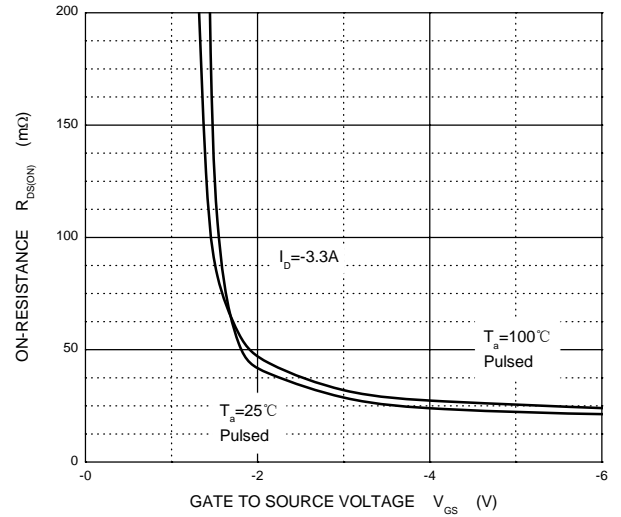
Transfer Characteristics



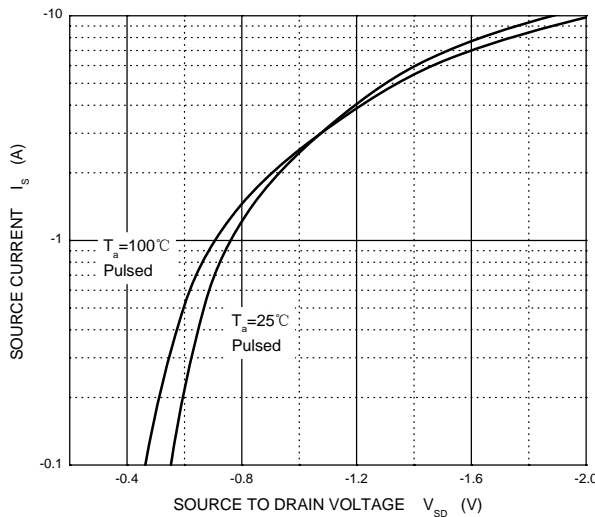
$R_{DS(ON)}$ — I_D



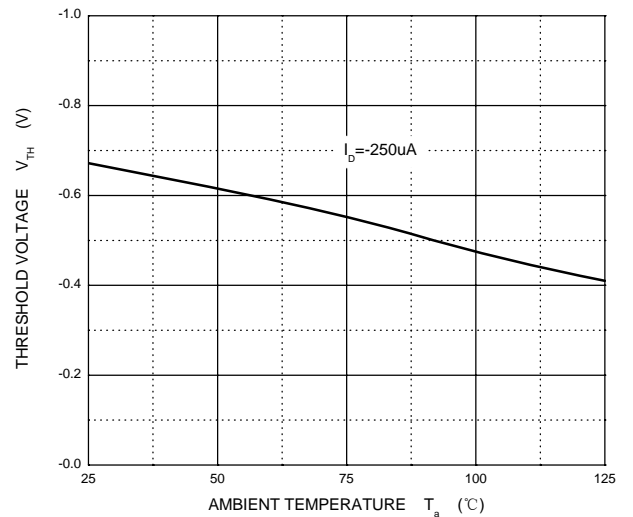
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage





Micro Commercial Components

Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel:3.0Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

IMPORTANT NOTICE

Micro Commercial Components Corp. reserves the right to make changes without further notice to any product herein to make corrections, modifications , enhancements , improvements , or other changes . Micro Commercial Components Corp . does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights ,nor the rights of others . The user of products in such applications shall assume all risks of such use and will agree to hold Micro Commercial Components Corp . and all the companies whose products are represented on our website, harmless against all damages.

LIFE SUPPORT

MCC's products are not authorized for use as critical components in life support devices or systems without the express written approval of Micro Commercial Components Corporation.

CUSTOMER AWARENESS

Counterfeiting of semiconductor parts is a growing problem in the industry. Micro Commercial Components (MCC) is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. MCC strongly encourages customers to purchase MCC parts either directly from MCC or from Authorized MCC Distributors who are listed by country on our web page cited below. Products customers buy either from MCC directly or from Authorized MCC Distributors are genuine parts, have full traceability, meet MCC's quality standards for handling and storage. MCC will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. MCC is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.