

RoHS Compliant Product
A suffix of "-C" specifies halogen and lead-free

FEATURES

- Surface Mount Package
- Super High Density Cell Design for Extremely Low RDS(ON)
- Exceptional On-resistance and Maximum DC Current Capability

APPLICATIONS

- Power Management In Note Book
- Portable Equipment
- DC/DC Converter
- Load Switch

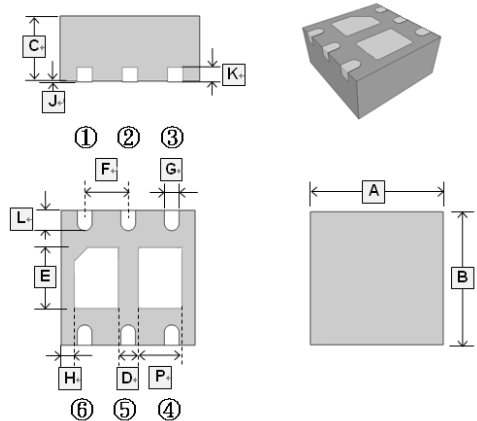
MARKING



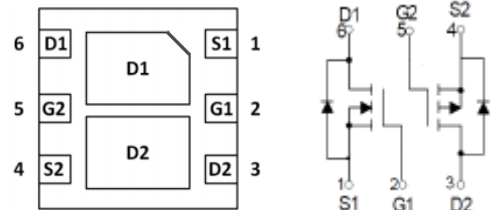
PACKAGE INFORMATION

Package	MPQ	Leader Size
DFN2x2-6L-J	3K	7 inch

DFN2x2-6L-J



REF.	Millimeter			REF.	Millimeter		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	2.00 BSC.			G	0.30 BSC		
B	2.00 BSC.			H	0.20 BSC		
C	0.675	0.75	0.80	J	0	-	0.06
D	0.30 Typ.			K	0.15	0.20	0.25
E	0.75	0.86	1.1	L	0.20	0.30	0.38
F	0.65BSC			P	0.52	0.65	0.72



ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise specified)

Parameter	Symbol	Rating		Unit
		N-ch	P-ch	
Drain-Source Voltage	V _{DS}	12	-12	V
Gate-Source Voltage	V _{GS}	±12	±12	V
Continuous Drain Current ¹	I _D	6	-4.1	A
Pulsed Drain Current(tp=10us)	I _{DM}	24	-16.4	A
Continuous Source-Drain Diode Current	I _S	6	-4.1	A
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)	T _L	260		°C
Operating Junction and Storage Temperature Range	T _J , T _{STG}	150, -55~150		°C
Thermal Resistance Rating				
Maximum Thermal Resistance from Junction to Ambient ¹	R _{θJA}	167		°C / W

N-CH ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	12	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS}=16\text{V}, V_{GS}=0$
Gate-Body Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{DS}=0, V_{GS}= \pm 12\text{V}$
Gate-Threshold Voltage ²	$V_{GS(th)}$	0.5	-	1	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	24	m Ω	$V_{GS}=10\text{V}, I_D=6\text{A}$
		-	-	27		$V_{GS}=4.5\text{V}, I_D=5\text{A}$
		-	-	42		$V_{GS}=2.5\text{V}, I_D=4\text{A}$
		-	-	74		$V_{GS}=1.8\text{V}, I_D=2\text{A}$
Forward Transfer conductance ²	g_{FS}	4	-	-	S	$V_{DS}=5\text{V}, I_D=3.8\text{A}$
Diode forward voltage	V_{SD}	-	-	1	V	$I_S=1\text{A}, V_{GS}=0\text{V}$
Dynamic Characteristics						
Input Capacitance	C_{iss}	-	630	-	pF	$V_{DS}=10\text{V}$ $V_{GS}=0$ $f=1\text{MHz}$
Output Capacitance	C_{oss}	-	164	-		
Reverse Transfer Capacitance	C_{rss}	-	137	-		
Switching Characteristics ³						
Turn-On Delay Time	$T_{d(ON)}$	-	5.5	-	nS	$V_{DS}=10\text{V}$ $V_{GS}=5\text{V}$ $R_G=6\Omega$ $R_L=1.7\Omega$
Rise Time	T_r	-	14	-		
Turn-Off Delay Time	$T_{d(OFF)}$	-	29	-		
Fall Time	T_f	-	10.2	-		
Total Gate Charge	Q_g	-	12	-	nC	$V_{DS}=10\text{V}$ $V_{GS}=10\text{V}$ $I_D=6\text{A}$
Gate-Source Charge	Q_{gs}	-	1	-		
Gate-Drain Charge	Q_{gd}	-	2	-		

P-CH ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

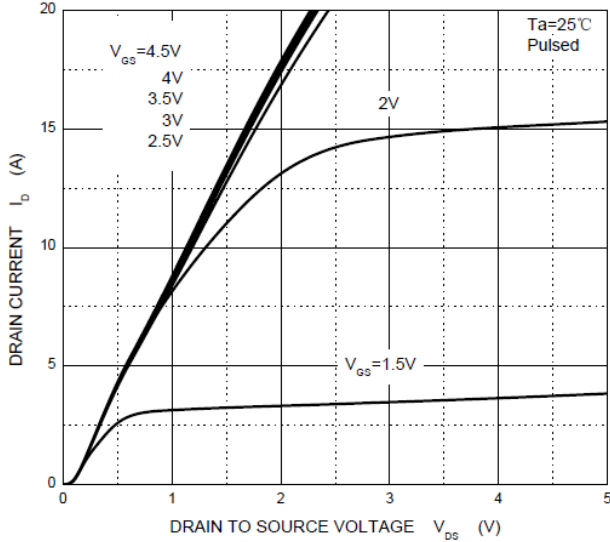
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	-12	-	-	V	$V_{GS}=0, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1	μA	$V_{DS} = -8\text{V}, V_{GS}=0$
Gate-Body Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{DS}=0, V_{GS} = \pm 8\text{V}$
Gate-Threshold Voltage ²	$V_{GS(th)}$	-0.5	-	-0.9	V	$V_{DS}=V_{GS}, I_D = -250\mu\text{A}$
Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	45	m Ω	$V_{GS} = -4.5\text{V}, I_D = -3.5\text{A}$
		-	-	60		$V_{GS} = -2.5\text{V}, I_D = -3\text{A}$
		-	-	90		$V_{GS} = -1.8\text{V}, I_D = -2\text{A}$
Forward Transfer conductance ²	g_{FS}	6	-	-	S	$V_{DS} = -5\text{V}, I_D = -4.1\text{A}$
Diode forward voltage	V_{SD}	-	-	-1.2	V	$I_S = -3.3\text{A}, V_{GS}=0\text{V}$
Dynamic Characteristics						
Input Capacitance	C_{iss}	-	740	-	pF	$V_{DS} = -4\text{V}$ $V_{GS}=0$ $f=1\text{MHz}$
Output Capacitance	C_{oss}	-	290	-		
Reverse Transfer Capacitance	C_{rss}	-	190	-		
Switching Characteristics ³						
Turn-On Delay Time	$T_{d(ON)}$	-	20	-	nS	$V_{DD} = -4\text{V}$ $V_{GEN} = -4.5\text{V}$ $I_D = -3.3\text{A}$ $R_G = 1\Omega$ $R_L = 1.2\Omega$
Rise Time	T_r	-	53	-		
Turn-Off Delay Time	$T_{d(OFF)}$	-	48	-		
Fall Time	T_f	-	20	-		
Total Gate Charge	Q_g	-	9	-	nC	$V_{DS} = -4\text{V}$ $V_{GS} = -2.5\text{V}$ $I_D = -4.1\text{A}$
Gate-Source Charge	Q_{gs}	-	1.2	-		
Gate-Drain Charge	Q_{gd}	-	1.6	-		

Notes:

1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse width=300 μs , duty cycle \leq 2%.
3. Switching characteristics are independent of operating junction temperature.

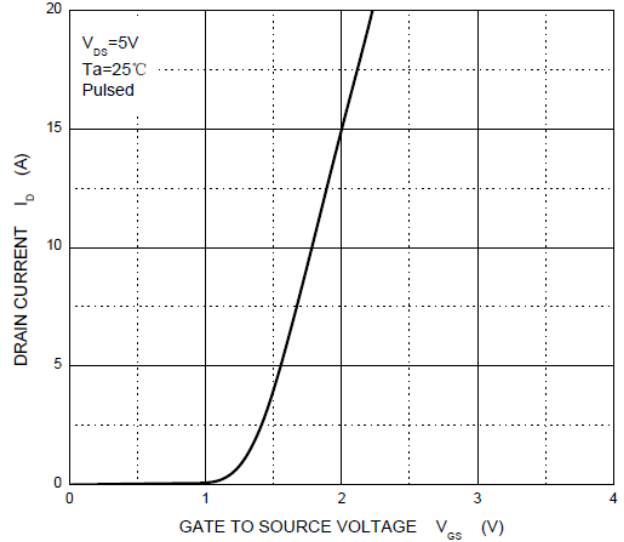
N-CH CHARACTERISTIC CURVE

Output Characteristics

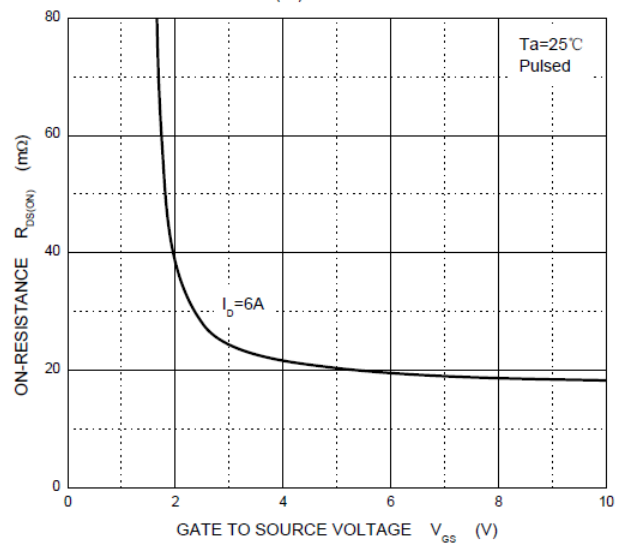
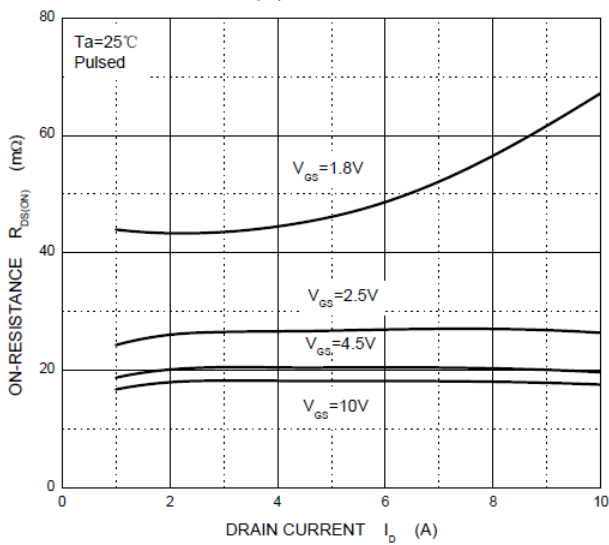


$R_{DS(ON)}$ — I_D

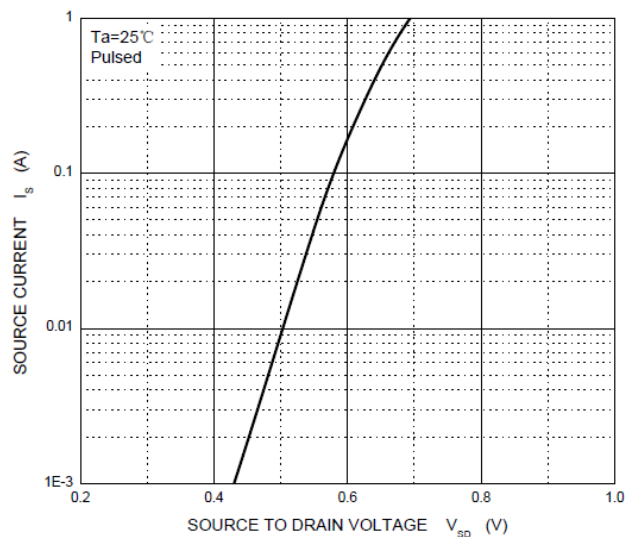
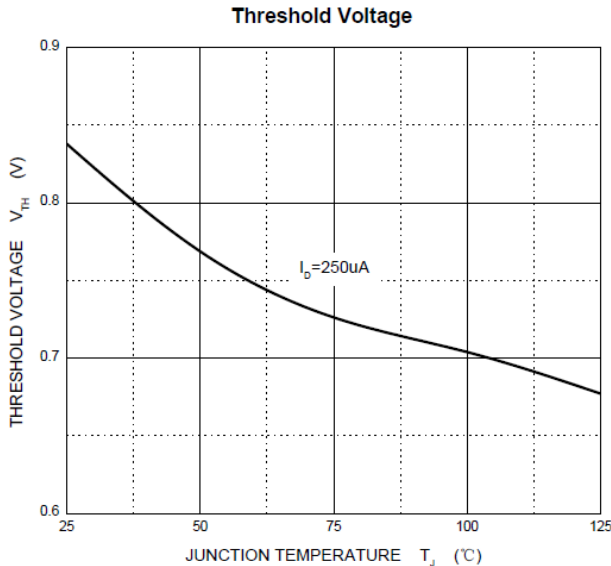
Transfer Characteristics



$R_{DS(ON)}$ — V_{GS}

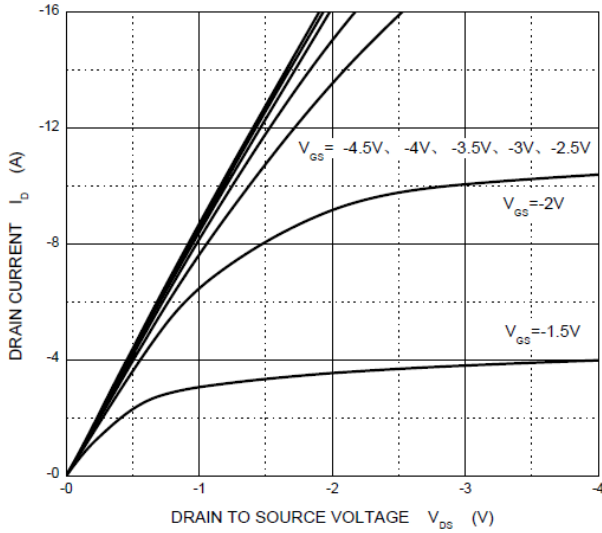


I_S — V_{SD}

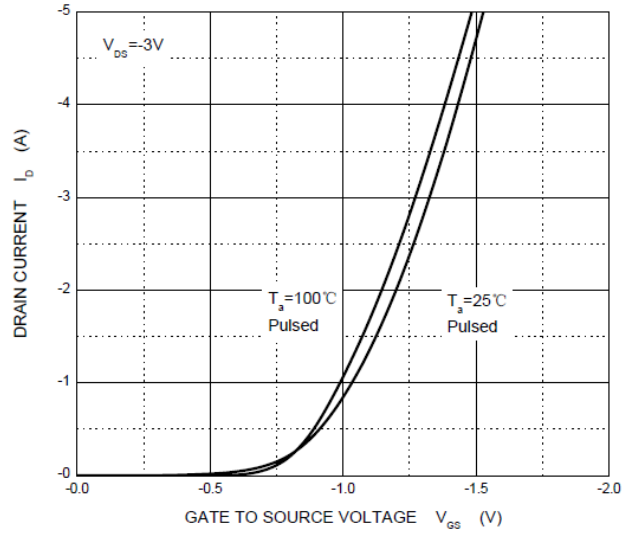


P-CH CHARACTERISTIC CURVE

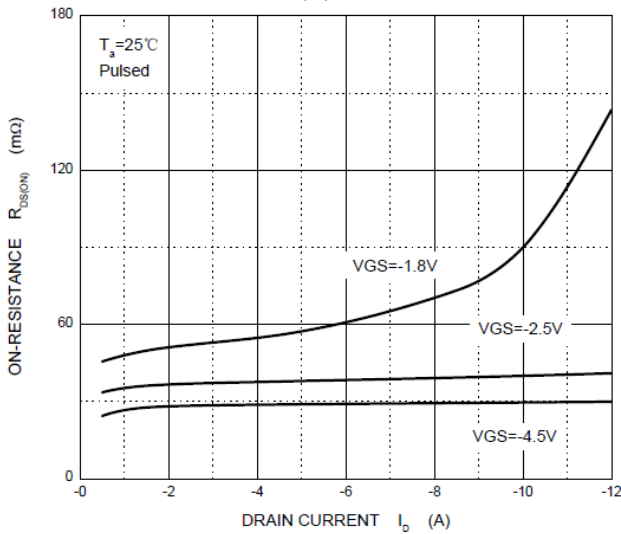
Output Characteristics



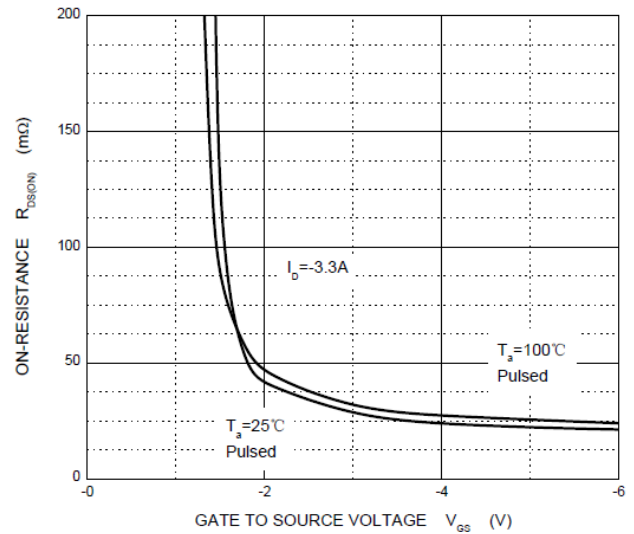
Transfer Characteristics



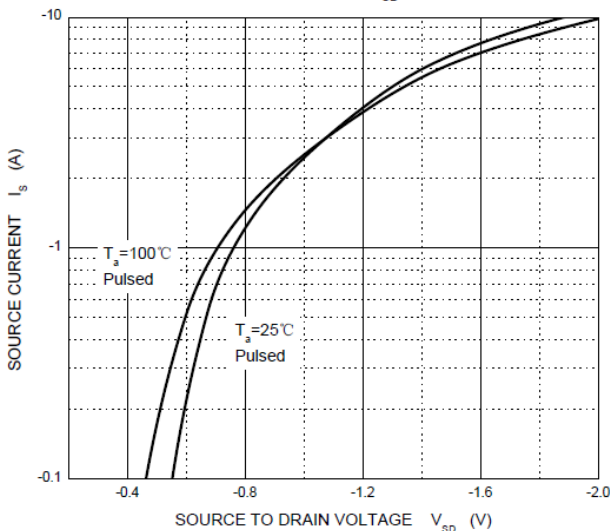
$R_{DS(ON)}$ — I_D



$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage

