

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

DESCRIPTION

The miniature surface mount MOSFETs utilize a high cell density trench process to provide low $R_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

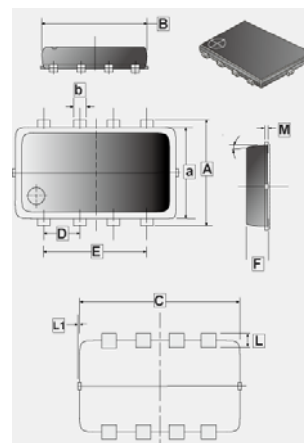
FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe 1206-8CF saves board space.
- Fast switching speed.
- High performance trench technology.

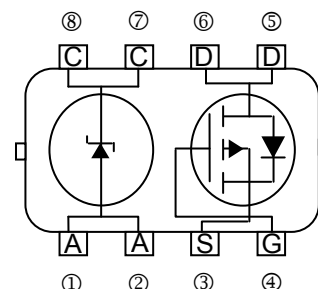
PACKAGE INFORMATION

Package	MPQ	LeaderSize
1206-8CF	3K	7' inch

1206-8CF



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.00	2.10	M	0.08	0.25
B	3.00	3.05	a	1.70	1.73
C	3.00	3.05	b	0.24	0.35
D	0.65	0.70	L	0.20	0.40
E	1.95	2.00	L1	0	0.1
F	0.70	0.90			



MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Ratings		Unit
Drain-Source Voltage (MOSFET)		V_{DS}	-20		V
Reverse Voltage (Schottky)		V_{KA}	20		V
Gate-Source Voltage (MOSFET)		V_{GS}	± 8		V
Continuous Drain Current($T_J=150^{\circ}\text{C}$)(MOSFET) ¹	$T_A=25^{\circ}\text{C}$	I_D	-2.5		A
	$T_A=70^{\circ}\text{C}$		-1.9		
Pulsed Drain Current (MOSFET) ²		I_{DM}	-10		A
Continuous Source Current (MOSFET Diode Conduction) ¹		I_S	-1.6		A
Average Forward Current (Schottky)		I_F	0.5		A
Pulse Forward Current (Schottky)		I_{FM}	8		A
Maximum Power Dissipation (MOSFET) ¹	$T_A=25^{\circ}\text{C}$	P_D	2.1		W
	$T_A=70^{\circ}\text{C}$		1.1		
Maximum Power Dissipation (Schottky) ¹	$T_A=25^{\circ}\text{C}$		1.3		
	$T_A=70^{\circ}\text{C}$		0.68		
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 ~ 150		$^{\circ}\text{C}$
Thermal Resistance Ratings					
Maximum Junction to Ambient ¹	$t \leq 5 \text{ sec}$	$R_{\theta JA}$	50	60	$^{\circ}\text{C/W}$
	Steady State		90	110	

Notes:

1. Surface Mounted on 1" x 1" FR4 Board.
2. Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	-0.4	-	-	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS} = 0\text{V}, V_{GS} = \pm 8\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1	μA	$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}$
		-	-	-10		$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(ON)}$	-5	-	-	A	$V_{DS} = -5\text{V}, V_{GS} = -4.5\text{V}$
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	-	-	0.110	Ω	$V_{GS} = -4.5\text{V}, I_D = -3.6\text{A}$
		-	-	0.160		$V_{GS} = -2.5\text{V}, I_D = -3.0\text{A}$
Forward Transconductance ¹	g_{FS}	-	3	-	S	$V_{DS} = -5\text{V}, I_D = -3.6\text{A}$
Diode Forward Voltage	V_{SD}	-	-0.70	-	V	$I_S = -1.6\text{A}, V_{GS} = 0\text{V}$
Dynamic ²						
Total Gate Charge	Q_g	-	6.0	-	nC	$I_D = -3.6\text{A}$ $V_{DS} = -5\text{V}$ $V_{GS} = -4.5\text{V}$
Gate-Source Charge	Q_{gs}	-	0.80	-		
Gate-Drain Charge	Q_{gd}	-	1.30	-		
Turn-On Delay Time	$T_{d(ON)}$	-	6.5	-	nS	$V_{DD} = -5\text{V}$ $V_{GEN} = -4.5\text{V}$ $R_G = 6\Omega$ $R_L = 5\Omega$
Rise Time	T_r	-	20	-		
Turn-Off Delay Time	$T_{d(OFF)}$	-	31	-		
Fall Time	T_f	-	21	-		

SCHOTTKY SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward Voltage Drop ¹	V_F	-	-	0.48	V	$I_F = 0.5\text{A}$
		-	-	0.4		$I_F = 0.5\text{A}, T_J = 125^\circ\text{C}$
Maximum Reverse Leakage Current	I_{RM}	-	-	0.1	mA	$V_r = 30\text{V}$
		-	-	1		$V_r = 30\text{V}, T_J = 75^\circ\text{C}$
		-	-	10		$V_r = 30\text{V}, T_J = 125^\circ\text{C}$
Junction Capacitance	C_T	-	31	-	pF	$V_r = 10\text{V}$

Notes:

1. Pulse test : $PW \leq 300 \mu\text{s}$ duty cycle $\leq 2\%$.
2. Guaranteed by design, not subject to production testing.

CHARACTERISTIC CURVE

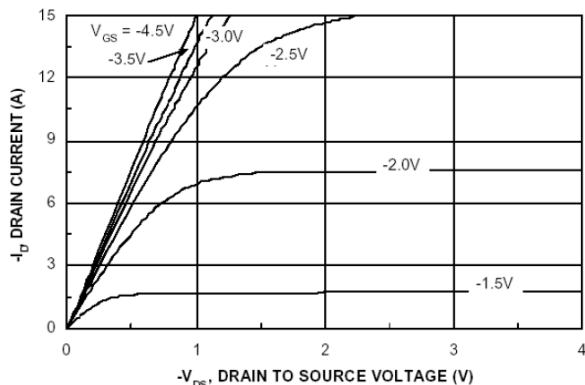


Figure 1. On-Region Characteristics

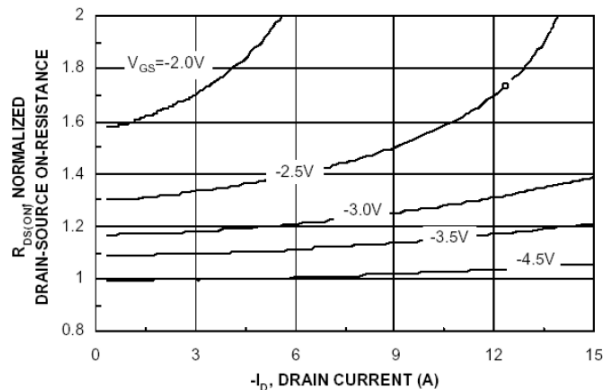


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

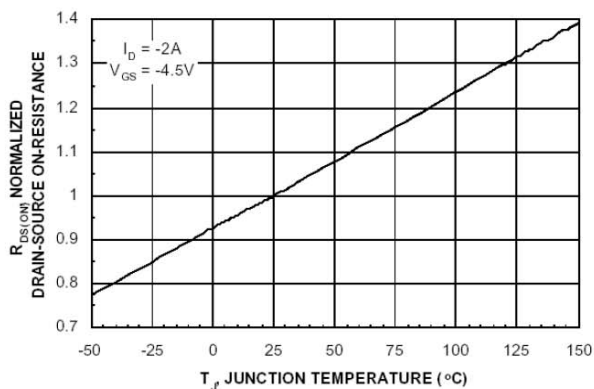


Figure 3. On-Resistance Variation with Temperature

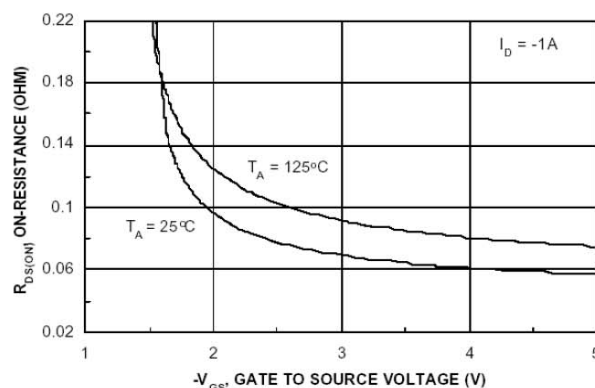


Figure 4. On-Resistance Variation with Gate to Source Voltage

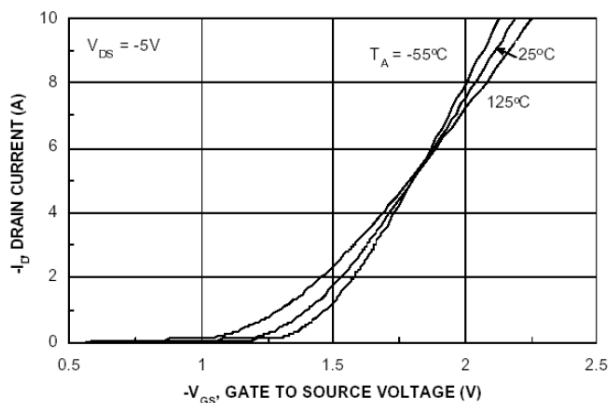


Figure 5. Transfer Characteristics

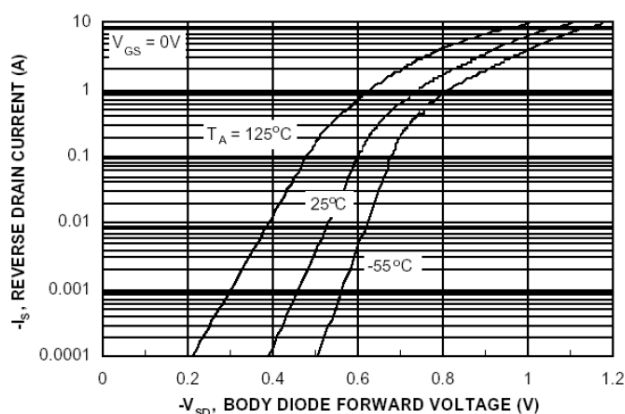


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

CHARACTERISTIC CURVE

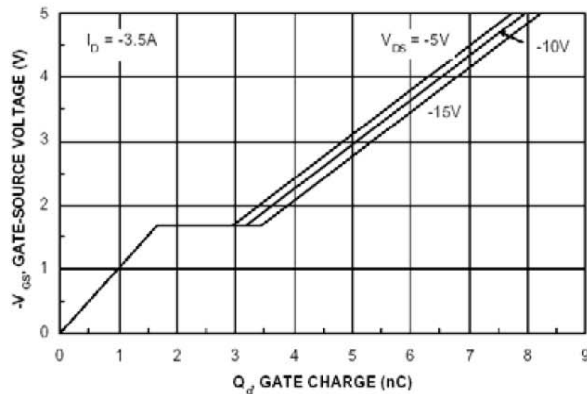


Figure 7. Gate Charge Characteristic

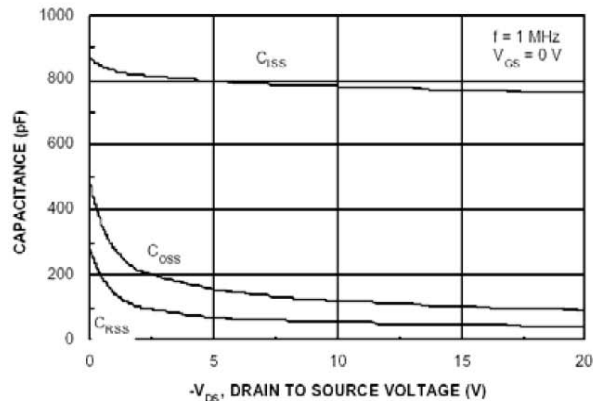


Figure 8. Capacitance Characteristic

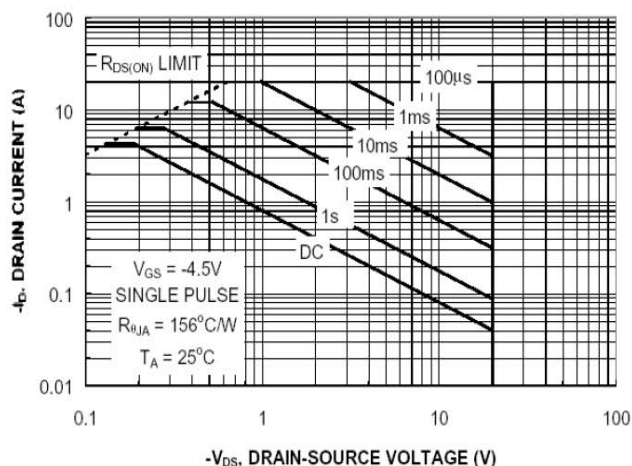


Figure 9. Maximum Safe Operating Area

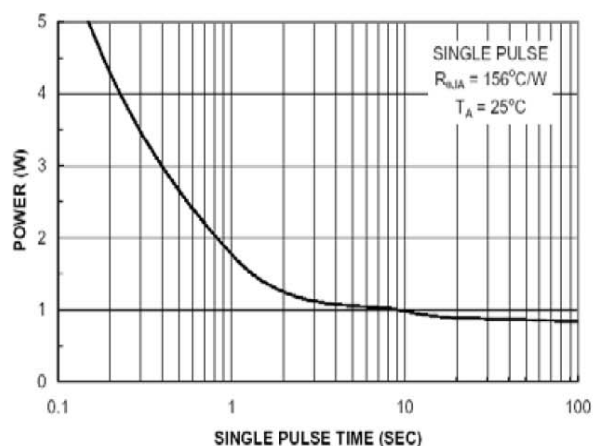


Figure 10. Single Pulse Maximum Power
Dissipation

Normalized Thermal Transient Junction to Ambient

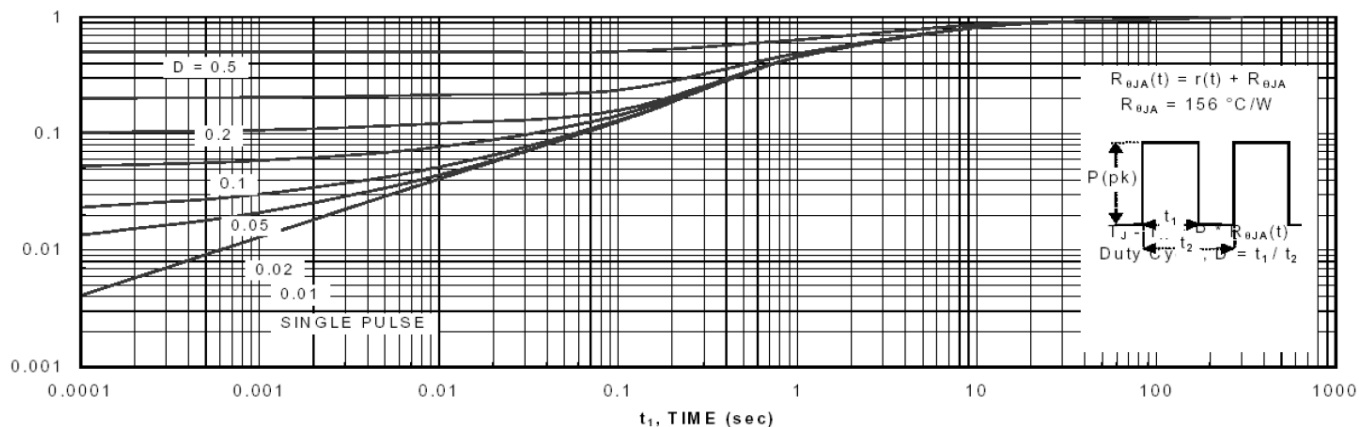


Figure 11. Transient Thermal Response Curve.