

RoHS Compliant Product

A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

These 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.

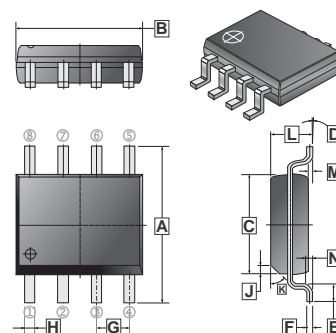
FEATURES

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

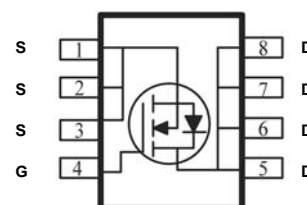
PACKAGE INFORMATION

Package	MPQ	LeadPitch
SOP-8	2.5K	13' inch

SOP-8



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	H	0.35	0.49
B	4.80	5.00	J	0.375 REF.	
C	3.80	4.00	K	45°	
D	0°	8°	L	1.35	1.75
E	0.40	0.90	M	0.10	0.25
F	0.19	0.25	N	0.25 REF.	
G	1.27 TYP.				



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

Parameter	Symbol	Ratings	Unit	
Drain-Source Voltage	V_{DS}	60	V	
Gate-Source Voltage	V_{GS}	± 20	V	
Continuous Drain Current ¹	$I_D @ T_A = 25^\circ\text{C}$	6.7	A	
	$I_D @ T_A = 70^\circ\text{C}$	5.8	A	
Pulsed Drain Current ²	I_{DM}	25	A	
Continuous Source Current (Diode Conduction) ¹	I_S	2	A	
Total Power Dissipation ¹	$P_D @ T_A = 25^\circ\text{C}$	3.1	W	
	$P_D @ T_A = 70^\circ\text{C}$	2	W	
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55 ~ 150	$^\circ\text{C}$	
THERMAL RESISTANCE RATINGS				
Maximum Junction to Ambient ^a	$t \leq 10$ sec	$R_{\theta JA}$	40	$^\circ\text{C} / \text{W}$
	Steady State		80	$^\circ\text{C} / \text{W}$

Notes:

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

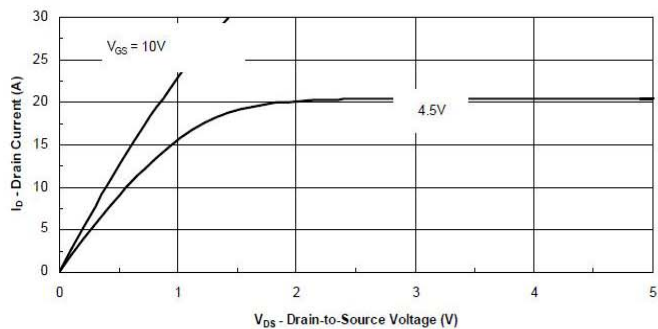
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	-	V	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS} = 0\text{V}$, $V_{GS} = 20\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS} = 60\text{V}$, $V_{GS} = 0\text{V}$
		-	-	10	μA	$V_{DS} = 60\text{V}$, $V_{GS} = 0\text{V}$, $T_J = 55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(on)}$	20	-	-	A	$V_{DS} = 5\text{V}$, $V_{GS} = 10\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	38	m Ω	$V_{GS} = 10\text{V}$, $I_D = 6.7\text{A}$
		-	-	50		$V_{GS} = 4.5\text{V}$, $I_D = 5.9\text{A}$
Forward Transconductance ¹	g_{fs}	-	11	-	S	$V_{DS} = 15\text{V}$, $I_D = 5.2\text{A}$
Diode Forward Voltage	V_{SD}	-	-	1.2	V	$I_S = 2.0\text{A}$, $V_{GS} = 0\text{V}$
Dynamic ²						
Total Gate Charge	Q_g	-	8.5	-	nC	$I_D = 6.7\text{A}$ $V_{DS} = 30\text{V}$ $V_{GS} = 4.5\text{V}$
Gate-Source Charge	Q_{gs}	-	3.3	-		
Gate-Drain Charge	Q_{gd}	-	4.0	-		
Input Capacitance	C_{ISS}	-	1456	-	pF	f = 1 MHz $V_{DS} = 30\text{V}$ $V_{GS} = 0\text{V}$
Output Capacitance	C_{OSS}	-	172	-		
Reverse Transfer Capacitance	C_{RSS}	-	97	-		
Turn-On Delay Time	$T_{d(on)}$	-	18	-	nS	$V_{DD} = 30\text{V}$ $I_D = 1\text{A}$ $V_{GEN} = 10\text{V}$ $R_L = 30\Omega$
Rise Time	T_r	-	59	-		
Turn-Off Delay Time	$T_{d(off)}$	-	37	-		
Fall Time	T_f	-	9	-		

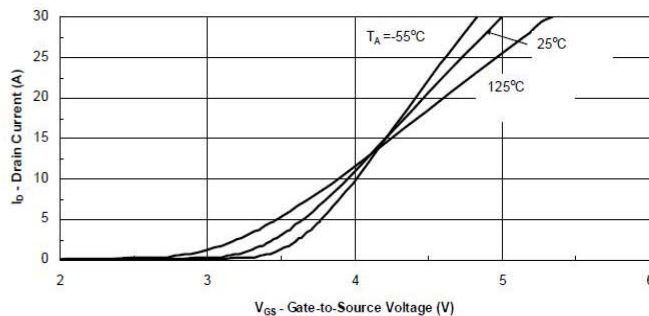
Notes:

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

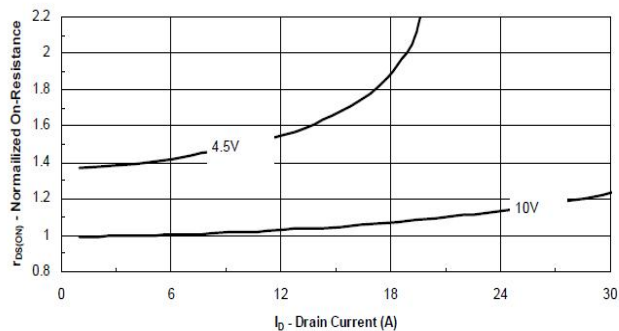
CHARACTERISTICS CURVE



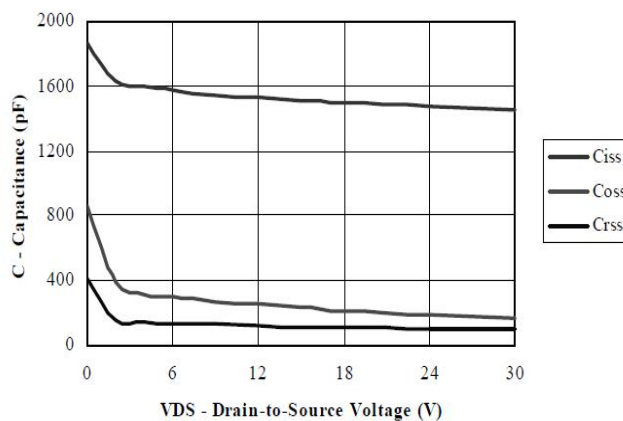
Output Characteristics



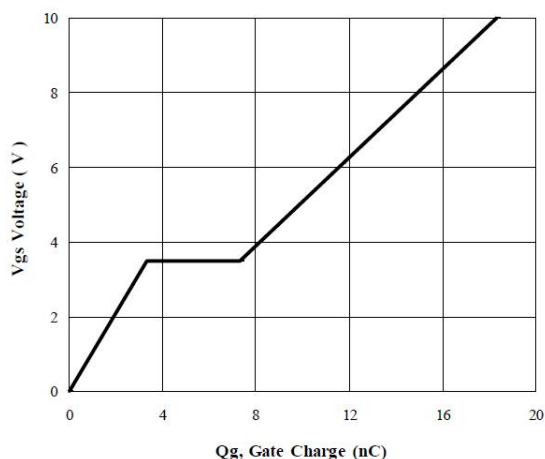
Transfer Characteristics



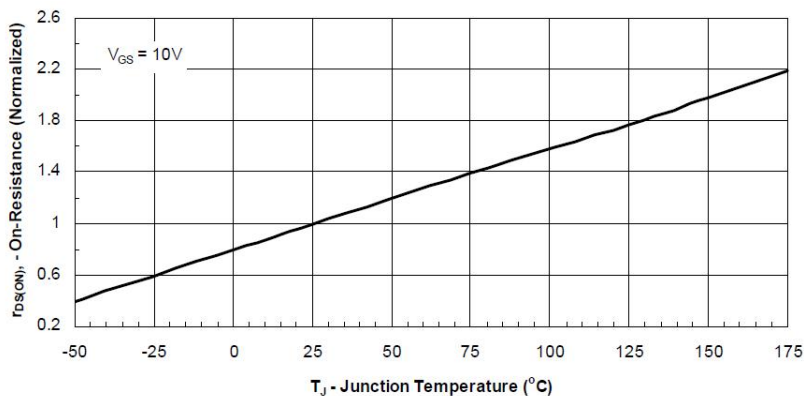
On-Resistance vs. Drain Current



Capacitance

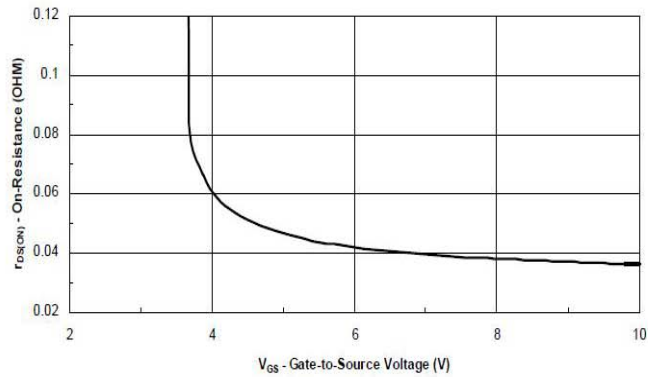
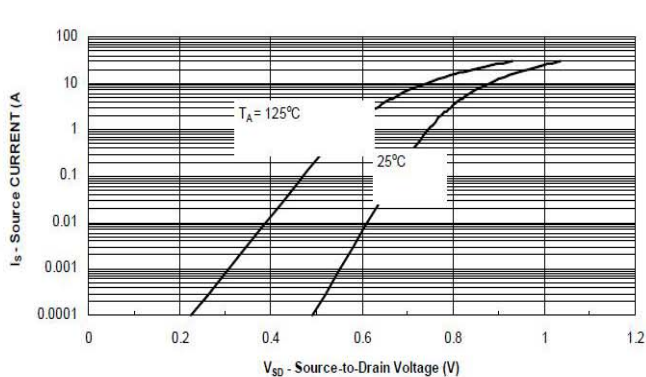


Gate Charge

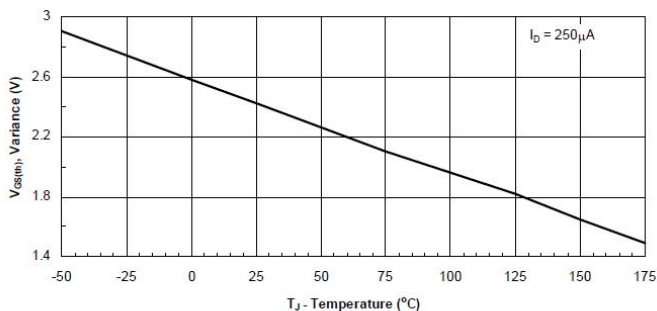


On-Resistance vs. Junction Temperature

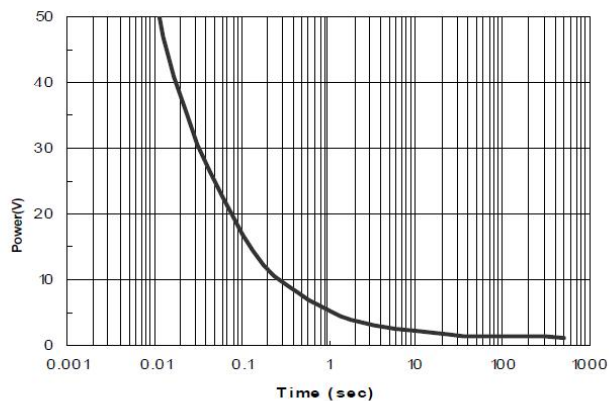
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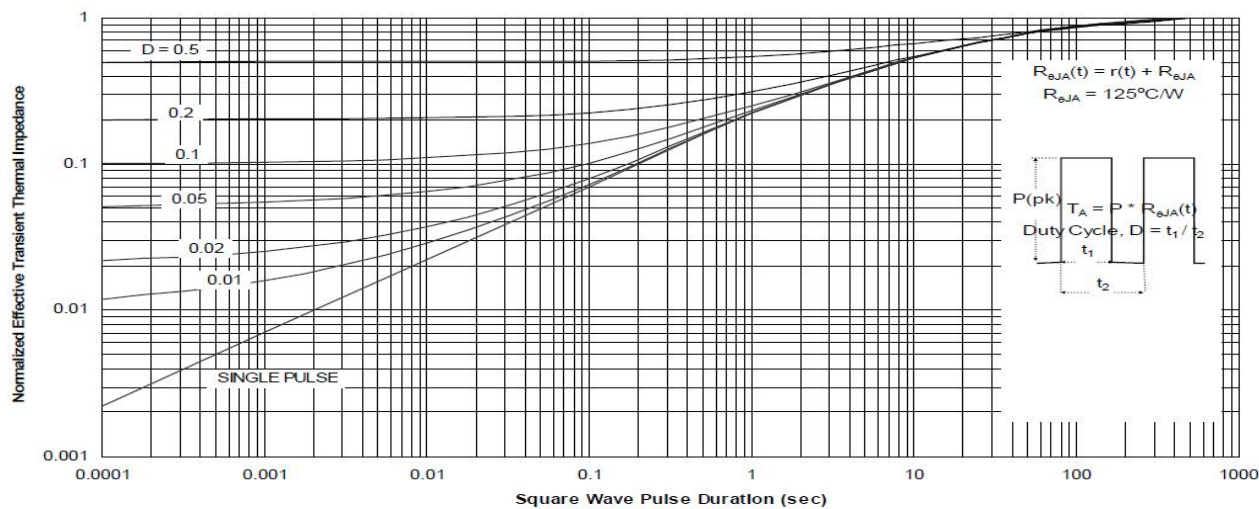
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to Source Voltage



Threshold Voltage



Single Pulse Power

Normalized Thermal Transient Impedance, Junction-to-Ambient