

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

## DESCRIPTION

These miniature surface mount MOSFETs utilize high cell density process. Low R<sub>DS(on)</sub> assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are PWMDC-DC converters, power management in portable and battery-powered products such as computers, printers, battery charger, telecommunication power system, and telephones power system.

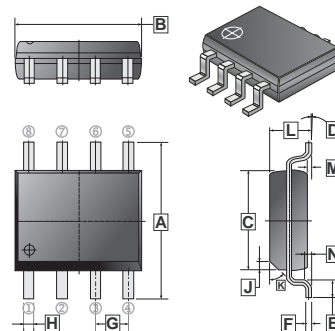
## FEATURES

- Low R<sub>DS(on)</sub> provides higher efficiency and extends battery life.
- Miniature SOP-8 surface mount package saves board space.
- High power and current handling capability.
- Extended V<sub>GS</sub> range (±25) for battery pack applications.

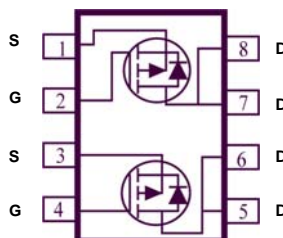
## PRODUCT SUMMARY

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V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (mΩ)	I <sub>D</sub> (A)
-30	21@V <sub>GS</sub> = -10V	-7.8
	35@V <sub>GS</sub> = -4.5V	-6.0

### 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<sub>A</sub> = 25°C unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT	
Drain-Source Voltage	V <sub>DS</sub>	-30	V	
Gate-Source Voltage	V <sub>GS</sub>	±25	V	
Continuous Drain Current <sup>a</sup>	I <sub>D</sub> @ T <sub>A</sub> = 25°C	-7.8	A	
	I <sub>D</sub> @ T <sub>A</sub> = 70°C	-6.2	A	
Pulsed Drain Current <sup>b</sup>	I <sub>DM</sub>	±30	A	
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	-1.7	A	
Total Power Dissipation <sup>a</sup>	P <sub>D</sub> @ T <sub>A</sub> = 25°C	2.0	W	
	P <sub>D</sub> @ T <sub>A</sub> = 70°C	1.3	W	
Operating Junction & Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 ~ 150	°C	
THERMAL RESISTANCE RATINGS				
Thermal Resistance Junction-ambient (Max.) <sup>a</sup>	t ≤ 10 sec	R <sub>θJA</sub>	62.5	°C / W
	Steady State		110	°C / W

Notes

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

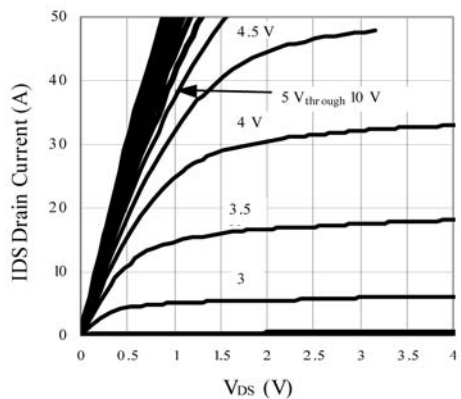
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
<b>STATIC</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-1	-	-3	V	$V_{DS} = V_{GS}$ , $I_D = -250\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{DS} = 0\text{V}$ , $V_{GS} = \pm 25\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	-1	$\mu\text{A}$	$V_{DS} = -24\text{V}$ , $V_{GS} = 0\text{V}$
		-	-	-5	$\mu\text{A}$	$V_{DS} = -24\text{V}$ , $V_{GS} = 0\text{V}$ , $T_J = 55^\circ\text{C}$
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	-40	-	-	A	$V_{DS} = -5\text{V}$ , $V_{GS} = -10\text{V}$
Drain-Source On-Resistance <sup>a</sup>	$R_{DS(ON)}$	-	19	21	m $\Omega$	$V_{GS} = -10\text{V}$ , $I_D = -7.8\text{A}$
		-	28	35		$V_{GS} = -4.5\text{V}$ , $I_D = -6.0\text{A}$
Forward Transconductance <sup>a</sup>	$g_{fs}$	-	22	-	S	$V_{DS} = -10\text{V}$ , $I_D = -7.8\text{A}$
Diode Forward Voltage	$V_{SD}$	-	-0.7	-1.2	V	$I_S = -1.7\text{A}$ , $V_{GS} = 0\text{V}$
<b>DYNAMIC <sup>b</sup></b>						
Total Gate Charge	$Q_g$	-	15	-	nC	$I_D = -7.8\text{A}$
Gate-Source Charge	$Q_{gs}$	-	5.2	-		$V_{DS} = -15\text{V}$
Gate-Drain Charge	$Q_{gd}$	-	5.8	-		$V_{GS} = -5\text{V}$
Turn-On Delay Time	$T_{d(on)}$	-	15	-	nS	$V_{DD} = -15\text{V}$
Rise Time	$T_r$	-	12	-		$I_D = -1\text{A}$
Turn-Off Delay Time	$T_{d(off)}$	-	62	-		$V_{GEN} = -10\text{V}$
Fall Time	$T_f$	-	46	-		$R_L = 6\Omega$

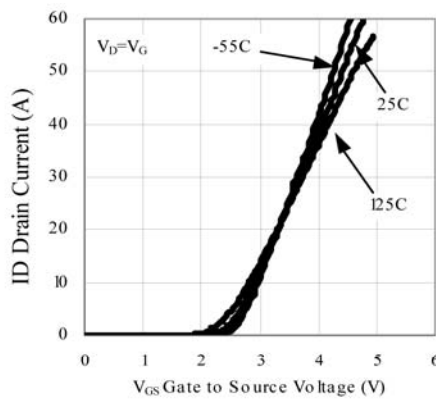
Notes

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

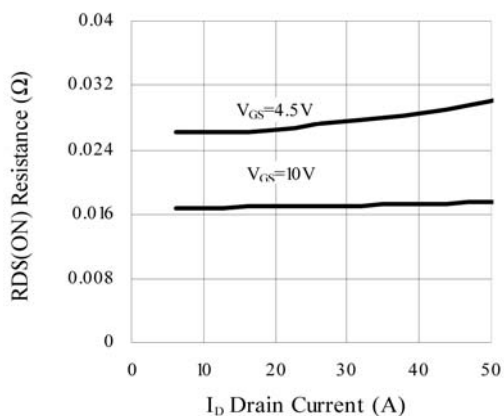
**CHARACTERISTIC CURVES**



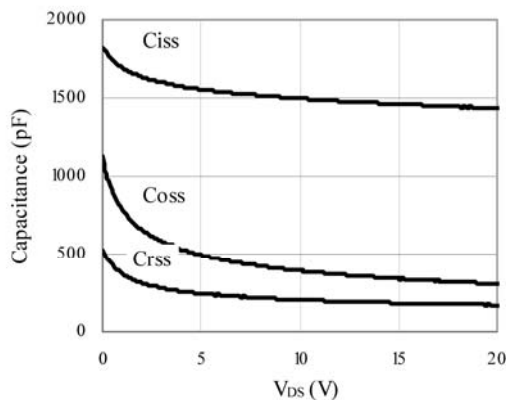
**Figure 1. Output Characteristics**



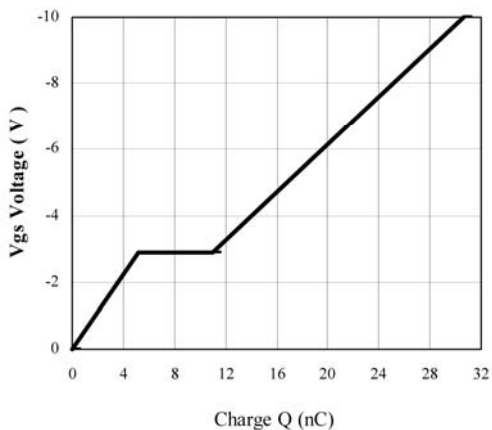
**Figure 2. Transfer Characteristics**



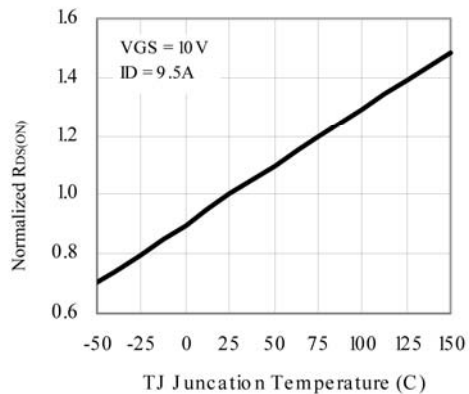
**Figure 3. On-Resistance vs. Drain Current**



**Figure 4. Capacitance**

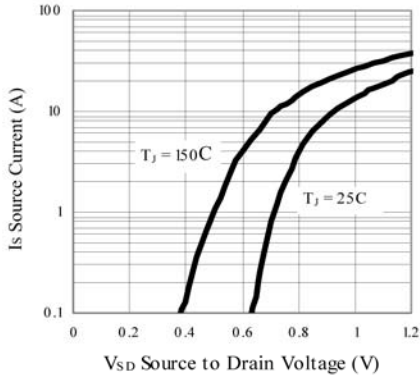


**Figure 5. Gate Charge**

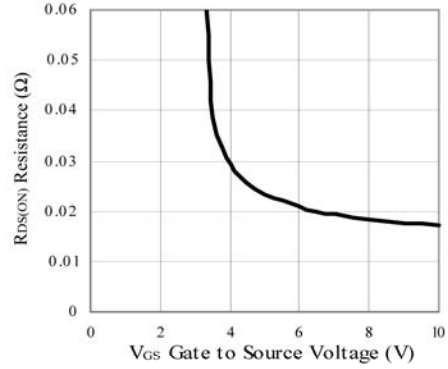


**Figure 6. On-Resistance vs. Junction Temperature**

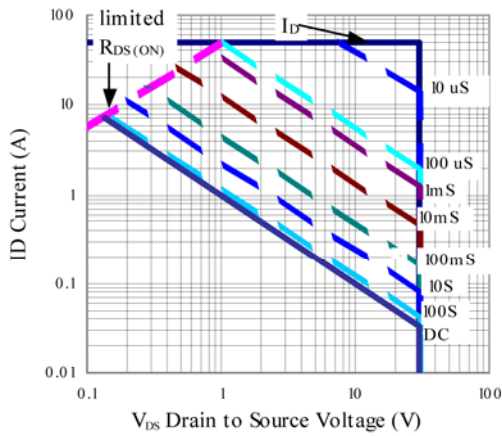
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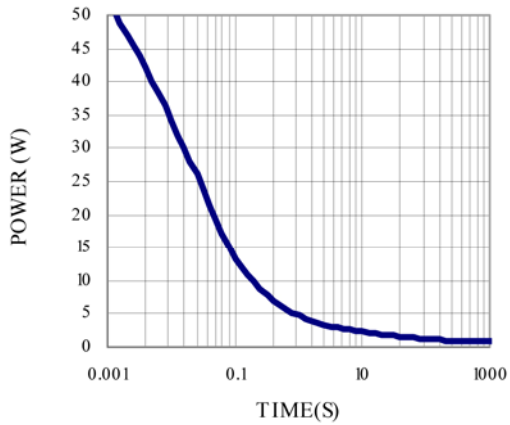
**Figure 7. Source-Drain Diode Forward Voltage**



**Figure 8. On-Resistance vs. Gate-to-Source Voltage**

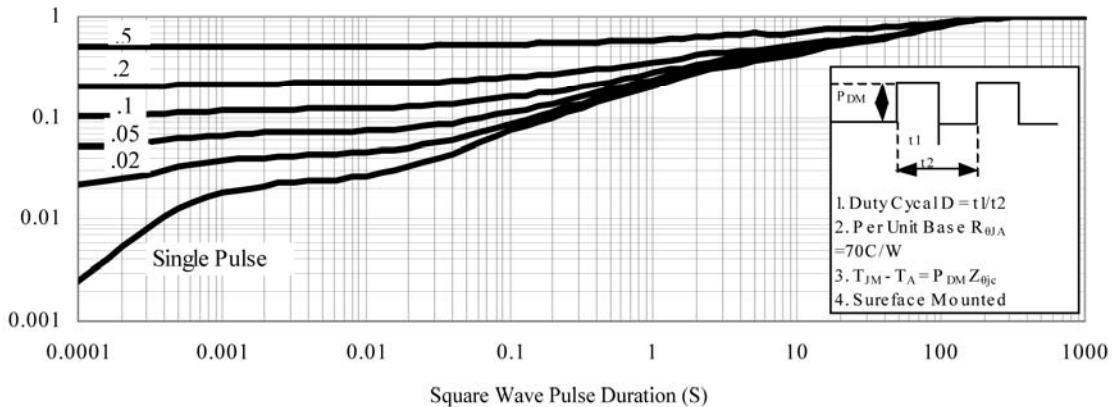


**Figure 9. Maximum Safe Operating Area**



**Figure 10. Single Pulse Maximum Power Dissipation**

**Normalized Thermal Transient Junction to Ambient**



**Figure 11. Transient Thermal Response Curve**