

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

## FEATURES

- Low  $R_{DS(on)}$  trench technology.
- Low thermal impedance.
- Fast switching speed.

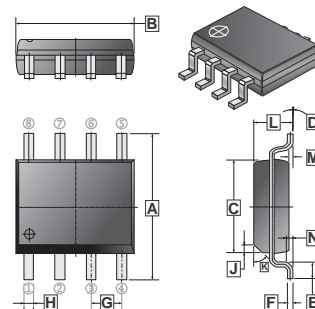
## APPLICATIONS

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

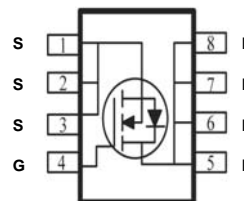
## PACKAGE INFORMATION

Package	MPQ	LeaderSize
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	$V_{DS}$	80	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Continuous Drain Current <sup>1</sup>	$I_D @ T_A = 25^\circ\text{C}$	7.1	A	
	$I_D @ T_A = 70^\circ\text{C}$	6	A	
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	50	A	
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	3.8	A	
Total Power Dissipation <sup>1</sup>	$P_D @ T_A = 25^\circ\text{C}$	3.1	W	
	$P_D @ T_A = 70^\circ\text{C}$	2.2	W	
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 ~ 150	$^\circ\text{C}$	
<b>Thermal Resistance Ratings</b>				
Thermal Resistance Junction-ambient (Max.) <sup>1</sup>	$t \leq 10$ 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.

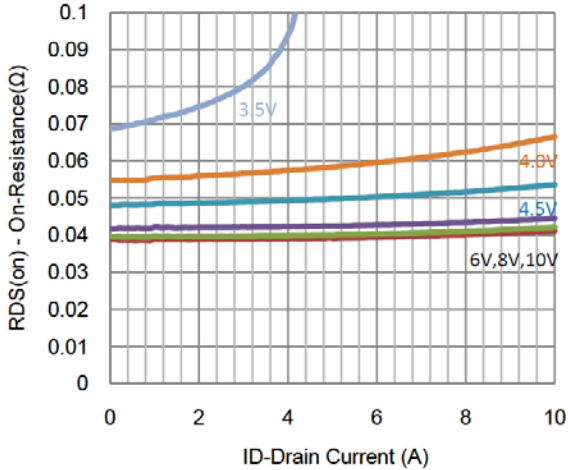
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	1	-	-	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	-	-	$\pm 10$	$\mu\text{A}$	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS} = 64\text{V}, V_{GS} = 0\text{V}$
		-	-	10		$V_{DS} = 64\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$
On-State Drain Current <sup>1</sup>	$I_{D(on)}$	20	-	-	A	$V_{DS} = 5\text{V}, V_{GS} = 10\text{V}$
Drain-Source On-Resistance <sup>1</sup>	$R_{DS(ON)}$	-	-	41	m $\Omega$	$V_{GS} = 10\text{V}, I_D = 5.4\text{A}$
		-	-	57		$V_{GS} = 4.5\text{V}, I_D = 4.6\text{A}$
Forward Transconductance <sup>1</sup>	$g_{fs}$	-	20	-	S	$V_{DS} = 15\text{V}, I_D = 5.4\text{A}$
Diode Forward Voltage	$V_{SD}$	-	0.76	-	V	$I_S = 2\text{A}, V_{GS} = 0\text{V}$
<b>Dynamic<sup>2</sup></b>						
Total Gate Charge	$Q_g$	-	19.5	-	nC	$I_D = 5.4\text{A}$ $V_{DS} = 40\text{V}$ $V_{GS} = 4.5\text{V}$
Gate-Source Charge	$Q_{gs}$	-	4.5	-		
Gate-Drain Charge	$Q_{gd}$	-	10	-		
Turn-On Delay Time	$T_{d(on)}$	-	12.8	-	nS	$V_{DD} = 40\text{V}$ $I_D = 5.4\text{A}$ $V_{GEN} = 10\text{V}$ $R_L = 7.5\Omega$ $R_{GEN} = 6\Omega$
Rise Time	$T_r$	-	24	-		
Turn-Off Delay Time	$T_{d(off)}$	-	52.3	-		
Fall Time	$T_f$	-	46	-		
Input Capacitance	$C_{ISS}$	-	1522	-	pF	$V_{DS} = 15\text{V}$ $V_{GS} = 0\text{V}$ $f = 1\text{Mhz}$
Output Capacitance	$C_{OSS}$	-	129	-		
Reverse Transfer Capacitance	$C_{RSS}$	-	87	-		

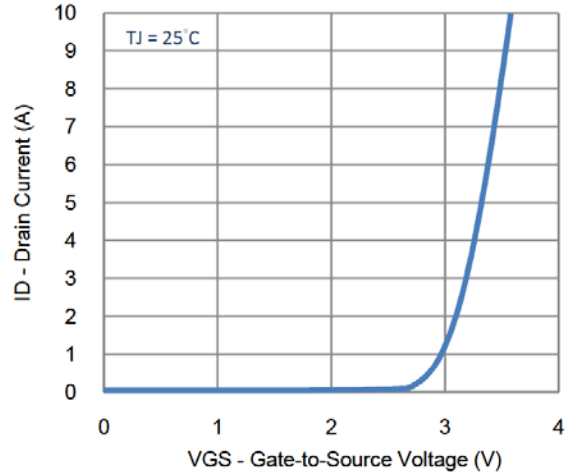
Notes

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

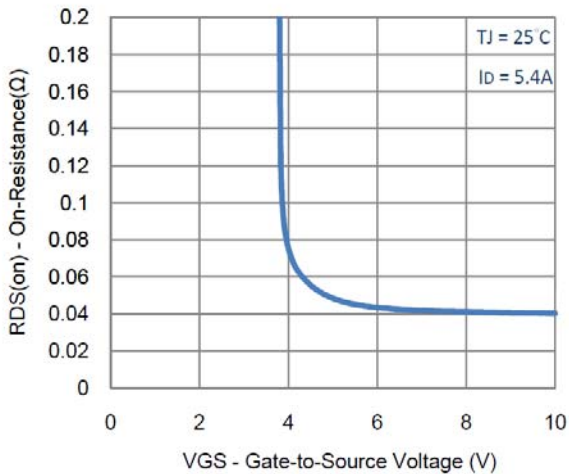
**TYPICAL ELECTRICAL CHARACTERISTICS CURVE**



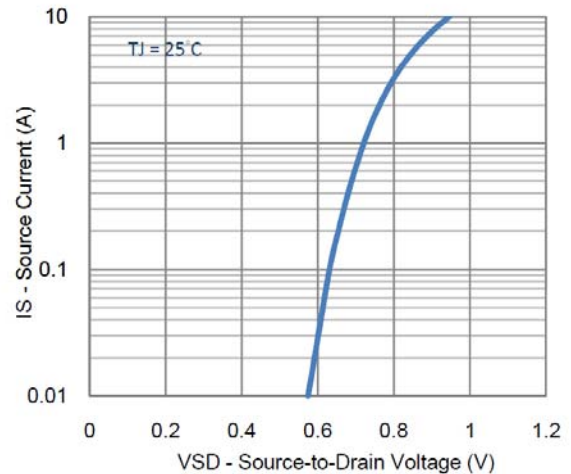
**1. On-Resistance vs. Drain Current**



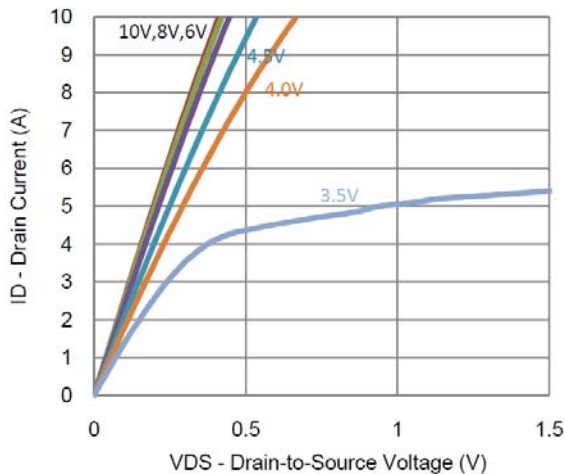
**2. Transfer Characteristics**



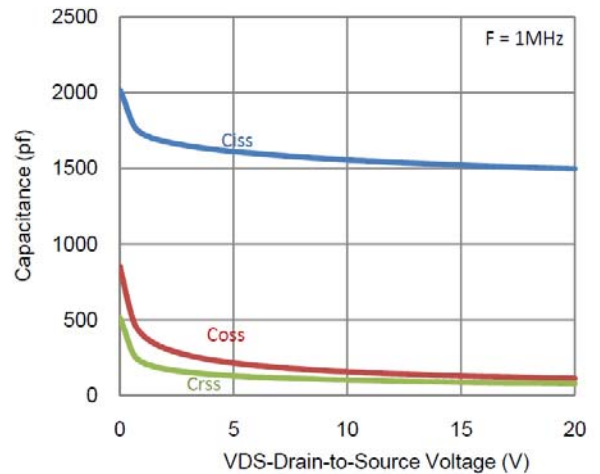
**3. On-Resistance vs. Gate-to-Source Voltage**



**4. Drain-to-Source Forward Voltage**

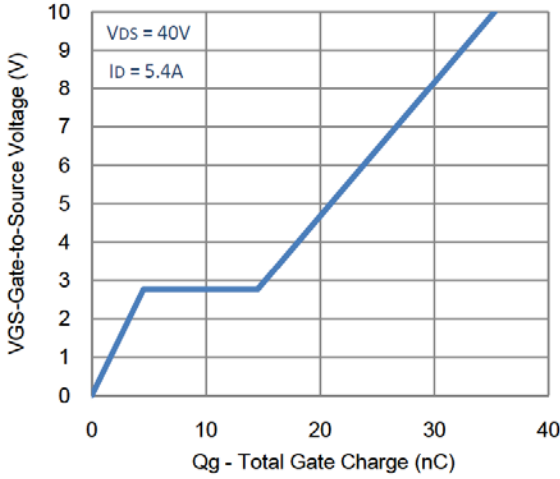


**5. Output Characteristics**

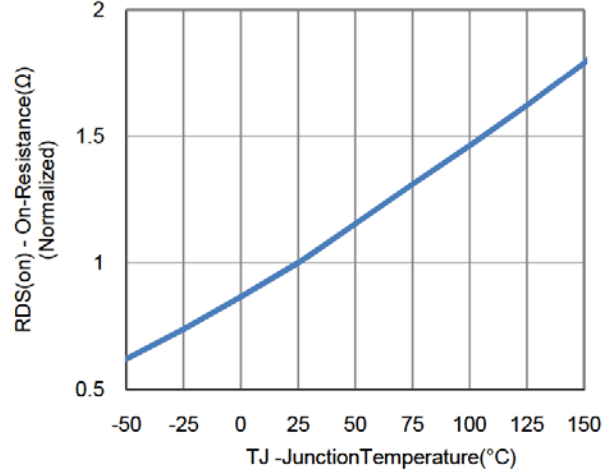


**6. Capacitance**

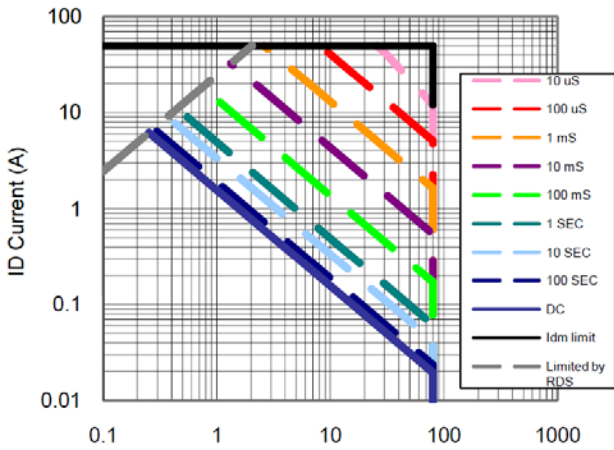
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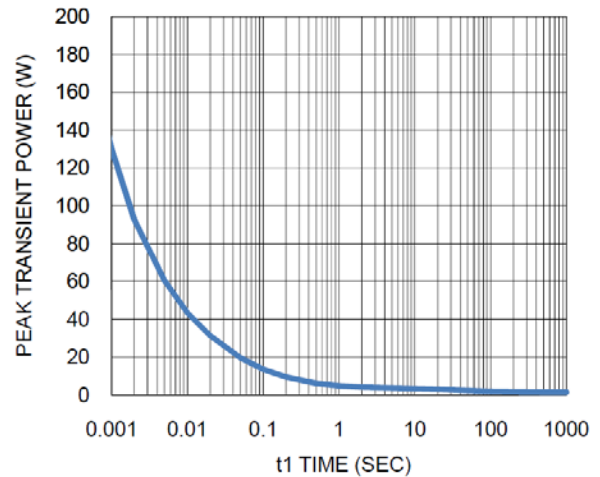
**7. Gate Charge**



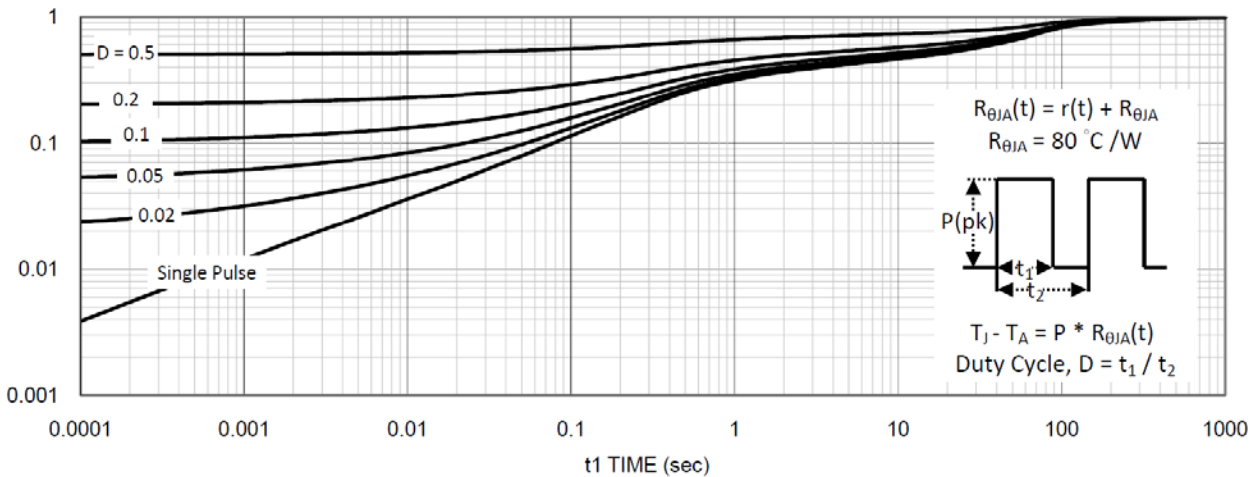
**8. Normalized On-Resistance Vs Junction Temperature**



**9. Safe Operating Area**



**10. Single Pulse Maximum Power Dissipation**



**11. Normalized Thermal Transient Junction to Ambient**