

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

FEATURES

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

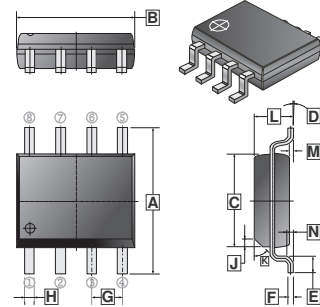
APPLICATIONS

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

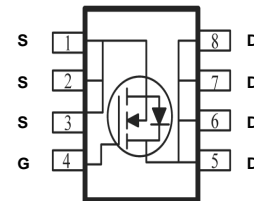
PACKAGE INFORMATION

Package	MPQ	Leader Size
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}	20	V	
Gate-Source Voltage	V_{GS}	± 12	V	
Continuous Drain Current ¹	I_D	$T_A = 25^\circ\text{C}$	6.9	A
		$T_A = 70^\circ\text{C}$	5.4	A
Pulsed Drain Current ²	I_{DM}	30	A	
Continuous Source Current (Diode Conduction) ¹	I_S	2.8	A	
Total Power Dissipation ¹	P_D	$T_A = 25^\circ\text{C}$	2.1	W
		$T_A = 70^\circ\text{C}$	1.3	W
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55 ~ 150	$^\circ\text{C}$	
Thermal Resistance Ratings				
Thermal Resistance Junction-ambient (Max.) ¹	$t \leq 10$ sec	$R_{\theta JA}$	62.5	$^\circ\text{C} / \text{W}$
	Steady State		110	$^\circ\text{C} / \text{W}$

Notes

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

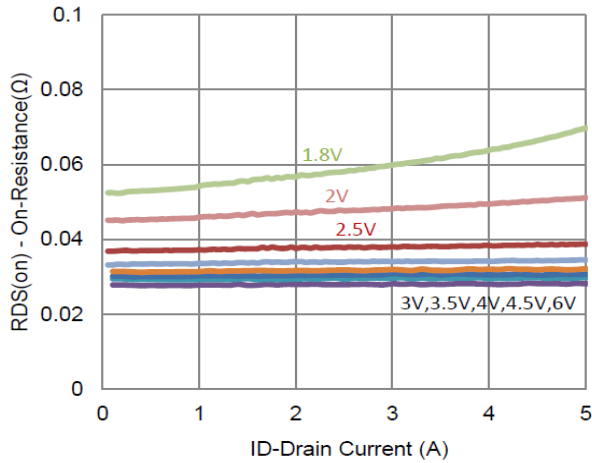
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

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 Current	I_{GSS}	-	-	± 100	nA	$V_{DS} = 0\text{V}, V_{GS} = \pm 12\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS} = 16\text{V}, V_{GS} = 0\text{V}$
		-	-	25		$V_{DS} = 16\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(on)}$	10	-	-	A	$V_{DS} = 5\text{V}, V_{GS} = 4.5\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	30	m Ω	$V_{GS} = 4.5\text{V}, I_D = 4.8\text{A}$
		-	-	40		$V_{GS} = 2.5\text{V}, I_D = 3.9\text{A}$
Forward Transconductance ¹	g_{fs}	-	22	-	S	$V_{DS} = 10\text{V}, I_D = 4.8\text{A}$
Diode Forward Voltage	V_{SD}	-	0.74	-	V	$I_S = 1.4\text{A}, V_{GS} = 0\text{V}$
Dynamic²						
Total Gate Charge	Q_g	-	7	-	nC	$I_D = 4.8\text{A}$ $V_{DS} = 10\text{V}$ $V_{GS} = 4.5\text{V}$
Gate-Source Charge	Q_{gs}	-	1.2	-		
Gate-Drain Charge	Q_{gd}	-	2.6	-		
Turn-On Delay Time	$T_{d(on)}$	-	10	-	nS	$V_{DS} = 10\text{V}$ $I_D = 4.8\text{A}$ $V_{GEN} = 4.5\text{V}$ $R_L = 2.1\Omega$ $R_{GEN} = 6\Omega$
Rise Time	T_r	-	17	-		
Turn-Off Delay Time	$T_{d(off)}$	-	38	-		
Fall Time	T_f	-	14	-		
Input Capacitance	C_{ISS}	-	439	-	pF	$V_{DS} = 15\text{V}$ $V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	C_{OSS}	-	78	-		
Reverse Transfer Capacitance	C_{RSS}	-	68	-		

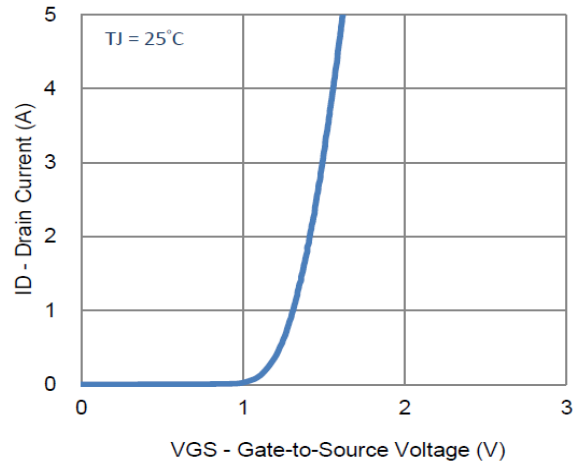
Notes

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

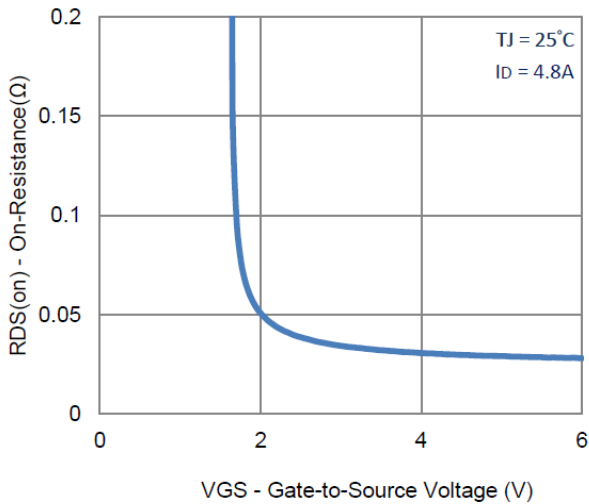
TYPICAL ELECTRICAL CHARACTERISTICS CURVE



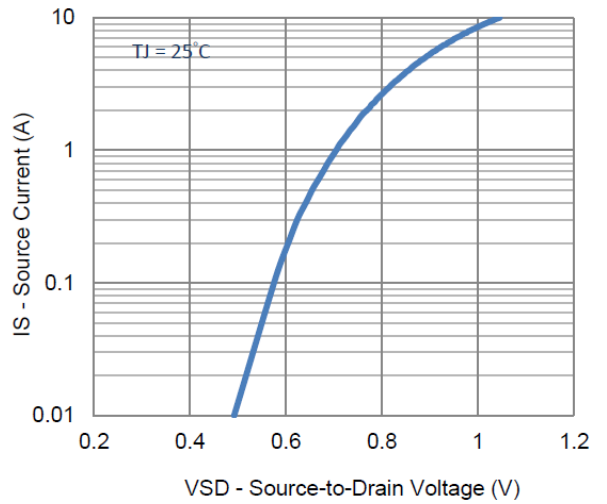
1. On-Resistance vs. Drain Current



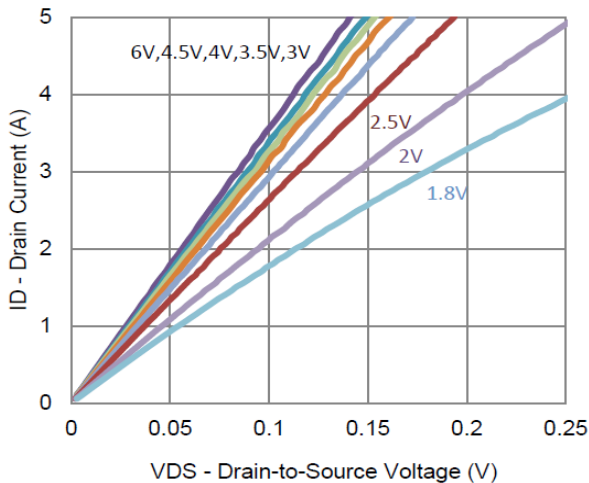
2. Transfer Characteristics



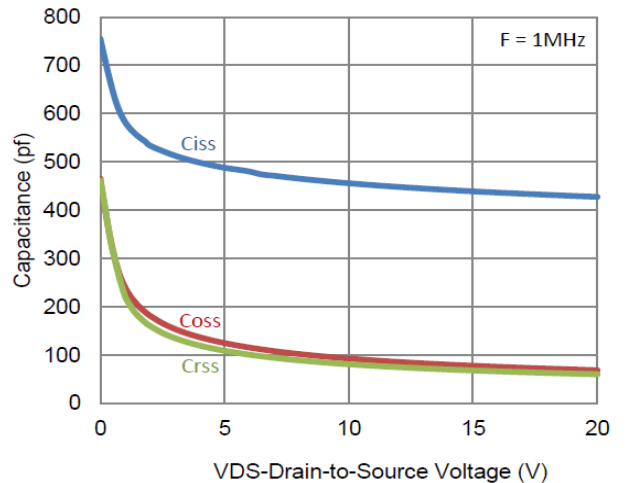
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

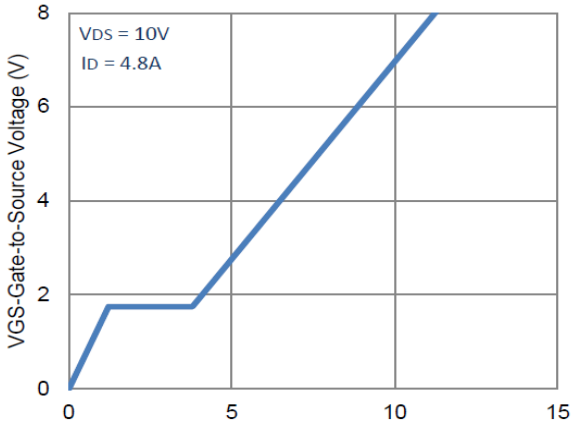


5. Output Characteristics

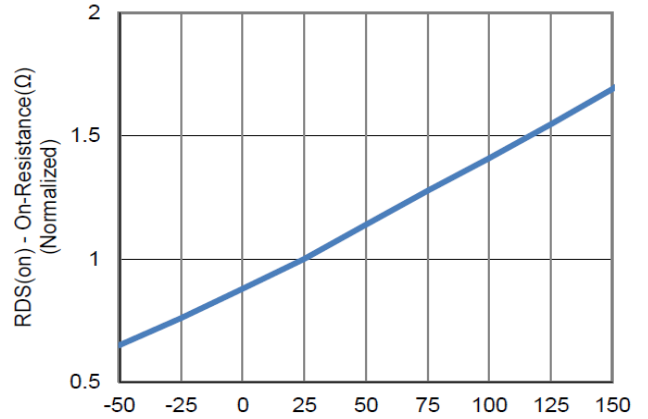


6. Capacitance

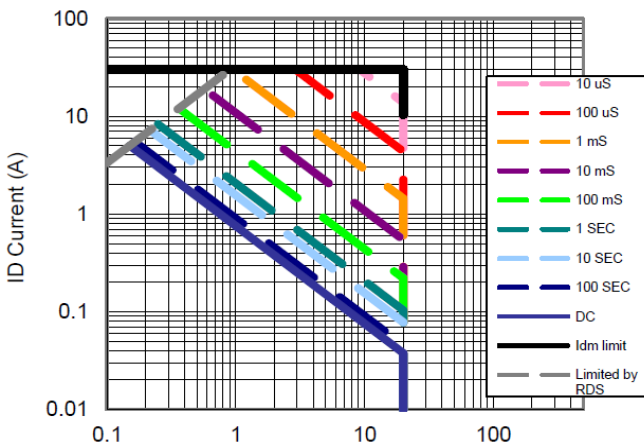
TYPICAL ELECTRICAL CHARACTERISTICS CURVE



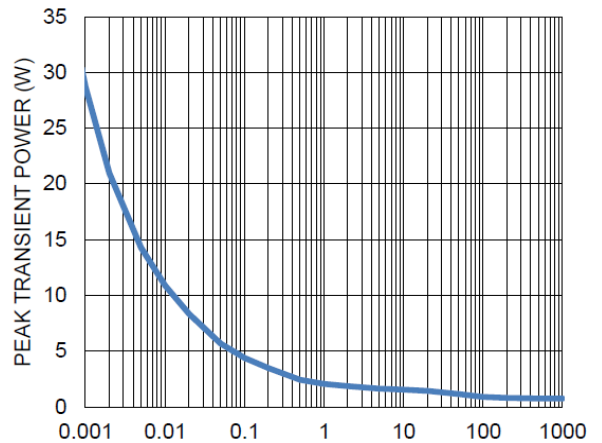
7. Gate Charge



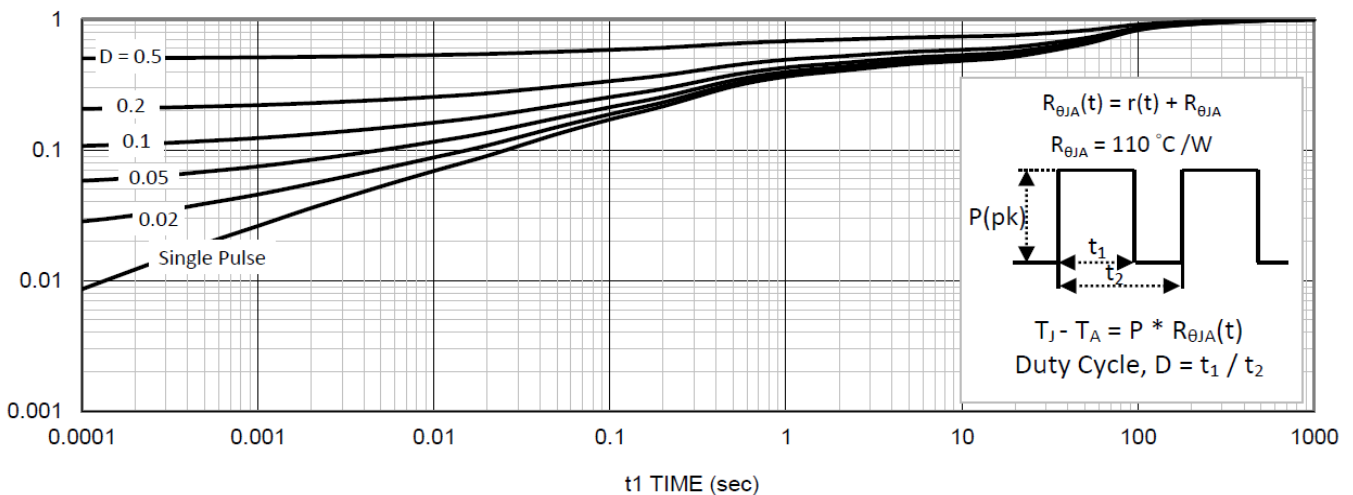
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient