

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

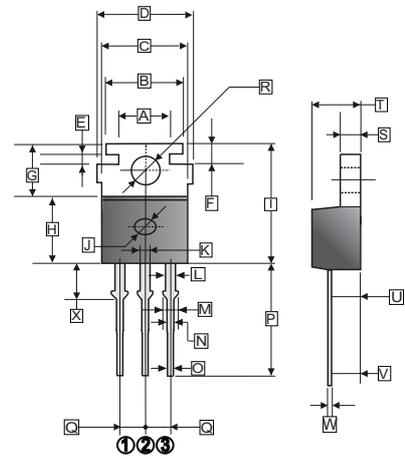
**FEATURES**

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

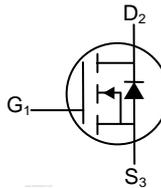
**APPLICATIONS**

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

**TO-220P**



**N-Channel**



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	7.90	8.10	M	-	1.50
B	9.45	9.65	N	0.75	0.95
C	9.87	10.47	O	0.66	0.86
D	-	11.50	P	13.50	14.50
E	1.06	1.46	Q	2.44	3.44
F	2.60	3.00	R	3.50	3.70
G	6.30	6.70	S	1.15	1.45
H	8.35	8.75	T	4.30	4.70
I	14.7	15.3	U	-	2.7
J	1.60	Typ.	V	1.89	3.09
K	1.10	1.30	W	0.40	0.60
L	1.17	1.37	X	2.60	3.60

**ABSOLUTE 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>	$I_D$	90	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	350	A
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	120	A
Power Dissipation <sup>1</sup>	$P_D$	300	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~175	$^\circ\text{C}$
<b>Thermal Resistance Rating</b>			
Maximum Junction to Ambient <sup>1</sup>	$t \leq 10\text{sec}$	$R_{\theta JA}$	62.5
	Steady State		0.5

Notes:

- 1 Package Limited.
- 2 Pulse width limited by maximum junction temperature.

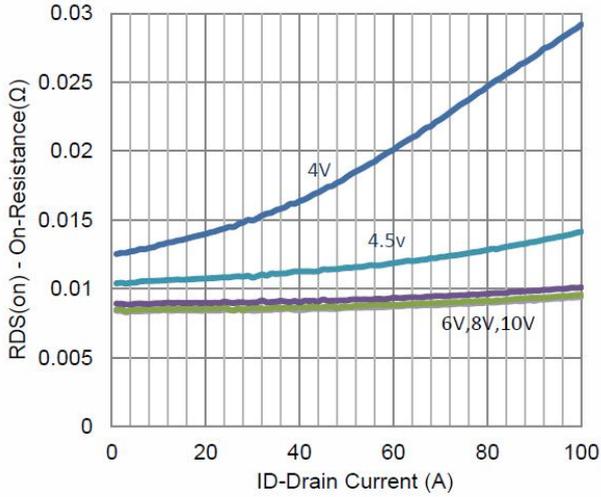
**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

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	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{DS}=0, V_{GS}=\pm 20\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=64\text{V}, V_{GS}=0$
		-	-	25		$V_{DS}=64\text{V}, V_{GS}=0, T_J=55^\circ\text{C}$
On-State Drain Current	$I_{D(on)}$	45	-	-	A	$V_{DS}=5\text{V}, V_{GS}=10\text{V}$
Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	11	m $\Omega$	$V_{GS}=10\text{V}, I_D=45\text{A}$
		-	-	13		$V_{GS}=4.5\text{V}, I_D=44\text{A}$
Forward Transconductance	$g_{fs}$	-	40	-	S	$V_{DS}=15\text{V}, I_D=45\text{A}$
Diode Forward Voltage	$V_{SD}$	-	0.9	-	V	$I_S=60\text{A}, V_{GS}=0$
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	-	58	-	nC	$V_{DS}=40\text{V},$ $V_{GS}=4.5\text{V},$ $I_D=20\text{A}$
Gate-Source Charge	$Q_{gs}$	-	14	-		
Gate-Drain Charge	$Q_{gd}$	-	39	-		
Turn-on Delay Time	$T_{d(on)}$	-	19	-	nS	$V_{DS}=40\text{V}, V_{GEN}=10\text{V},$ $R_L=2\Omega, I_D=20\text{A}, R_{GEN}=6\Omega$
Rise Time	$T_r$	-	45	-		
Turn-off Delay Time	$T_{d(off)}$	-	178	-		
Fall Time	$T_f$	-	62	-		
Input Capacitance	$C_{iss}$	-	4021	-	pF	$V_{DS}=15\text{V}, V_{GS}=0, f=1\text{MHz}$
Output Capacitance	$C_{oss}$	-	449	-		
Reverse Transfer Capacitance	$C_{rss}$	-	440	-		

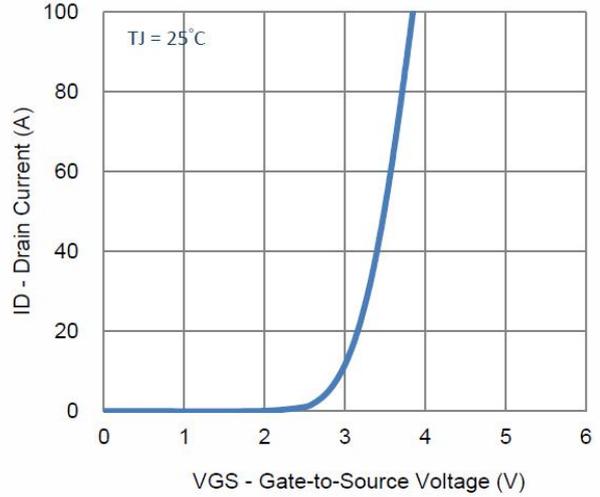
Notes:

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

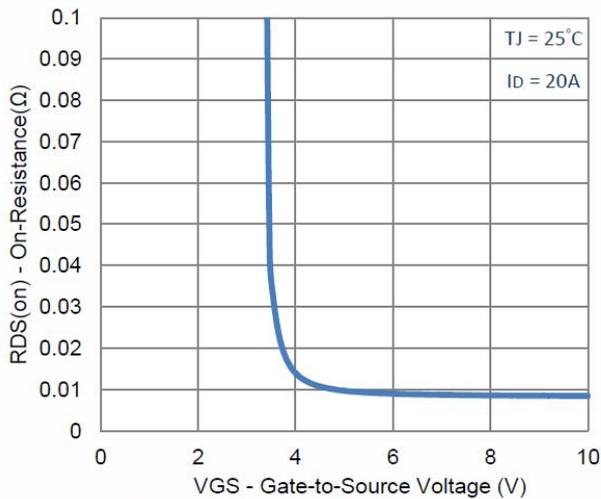
**CHARACTERISTIC CURVES**



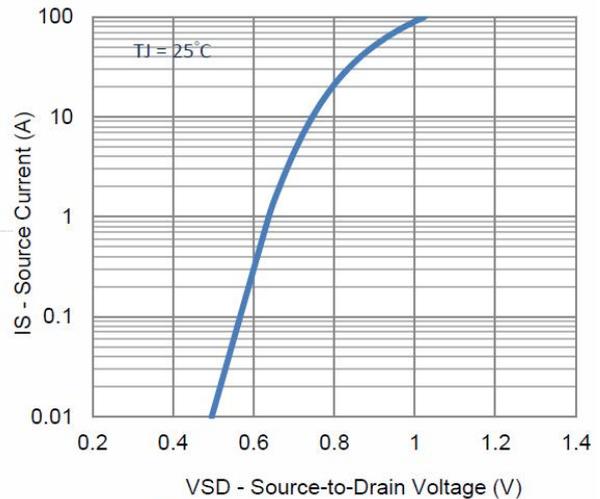
**1. On-Resistance vs. Drain Current**



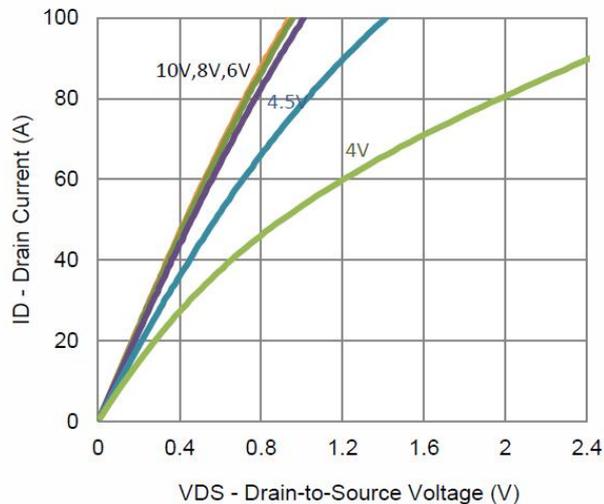
**2. Transfer Characteristics**



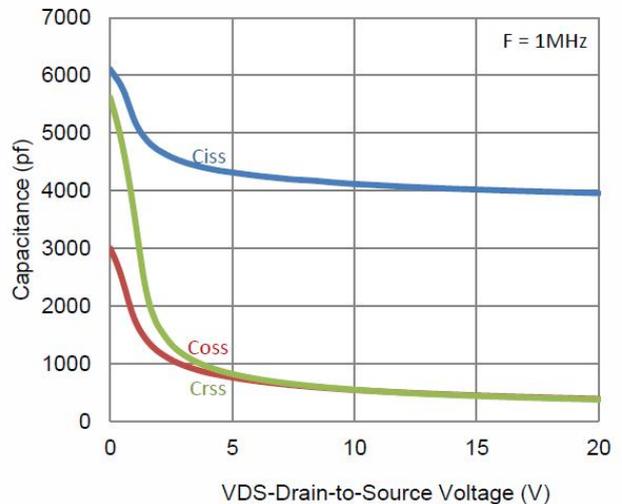
**3. On-Resistance vs. Gate-to-Source Voltage**



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

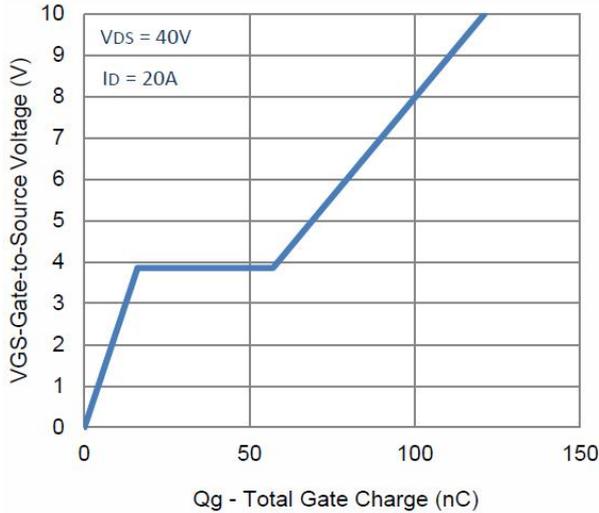


**5. Output Characteristics**

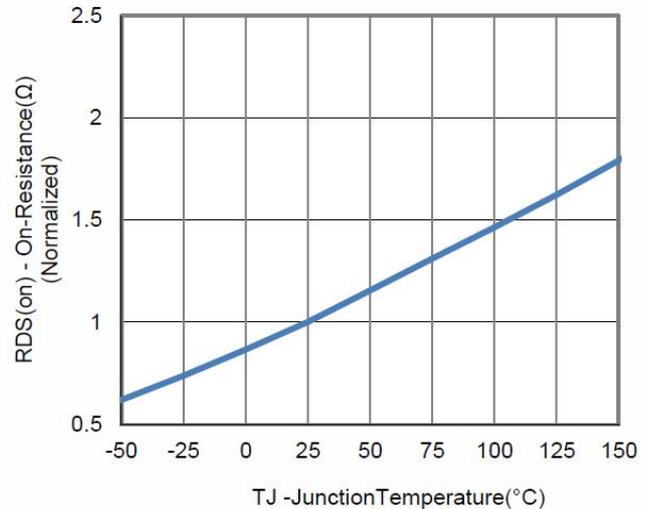


**6. Capacitance**

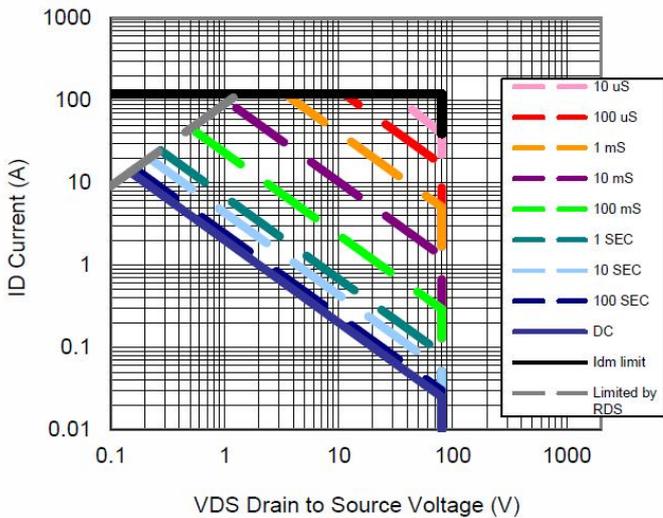
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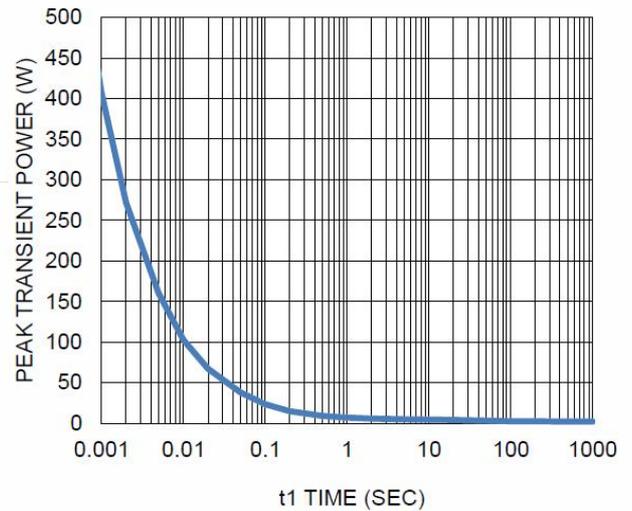
**7. Gate Charge**



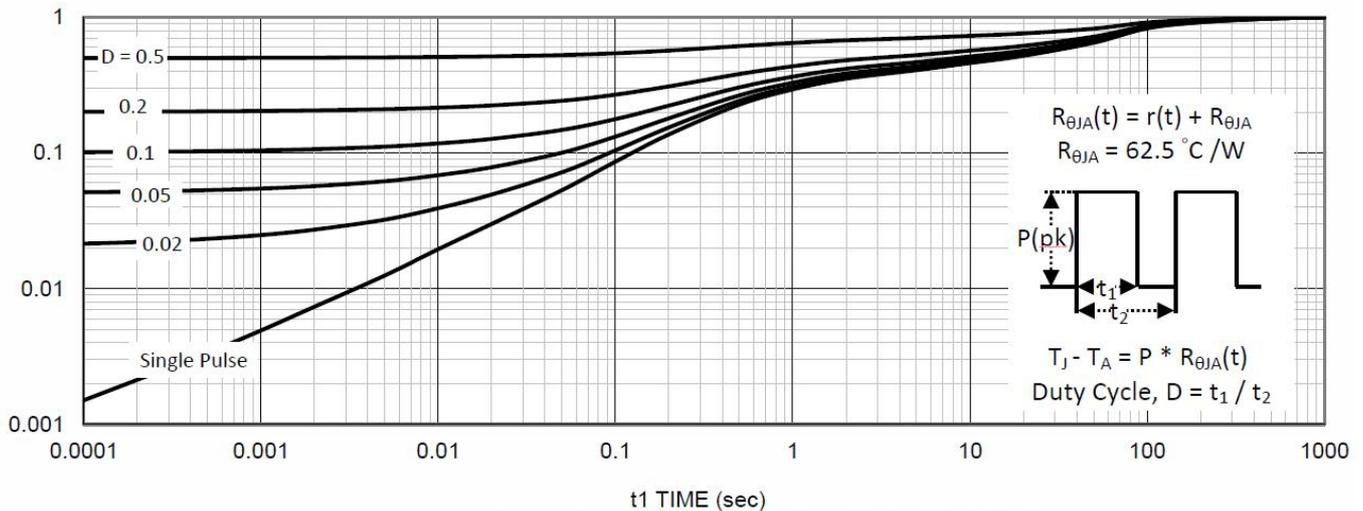
**8. Normalized On-Resistance Vs Junction Temperature**



**9. Safe Operating Area**



**10. Single Pulse Maximum Power Dissipation**



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