

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

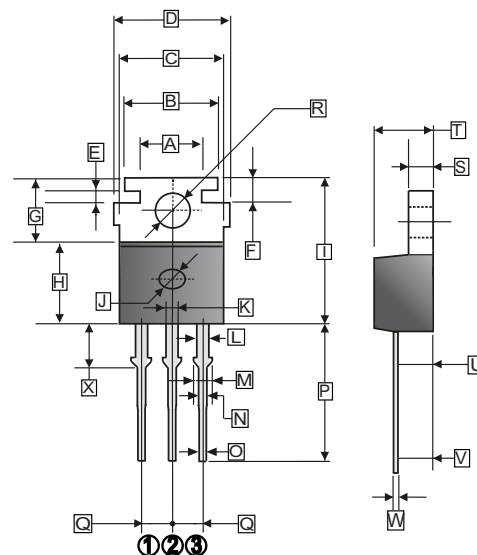
TO-220P

FEATURES

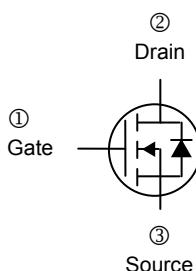
- Low $R_{DS(on)}$ Technology.
- Low thermal impedance.
- Fast switching speed.

APPLICATIONS

- Electronic ballast.
- Electronic transformer
- Switch mode power supply.



Dimensions in millimeters



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	7.90	8.10	N	0.75	0.95
B	9.45	9.65	O	0.66	0.86
C	9.87	10.47	P	13.50	14.50
D	-	11.50	Q	2.44	3.44
E	1.06	1.46	R	3.50	3.70
F	2.60	3.00	S	1.15	1.45
G	6.30	6.70	T	4.30	4.70
H	8.35	8.75	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
M	-	1.50			

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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	$I_D @ T_C = 25^\circ\text{C}$	4.5	A
Pulsed Drain Current ²	I_{DM}	18	A
Continuous Source Current (Diode Conduction) ¹	I_S	4.5	A
Total Power Dissipation ¹	$P_D @ T_C = 25^\circ\text{C}$	74	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ 175	$^\circ\text{C}$
THERMAL RESISTANCE RATINGS			
Maximum Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	62.5	$^\circ\text{C} / \text{W}$
Maximum Thermal Resistance Junction-Case	$R_{\theta JC}$	1.7	$^\circ\text{C} / \text{W}$

Notes :

1 Package Limited.

2 Pulse width limited by maximum junction temperature.

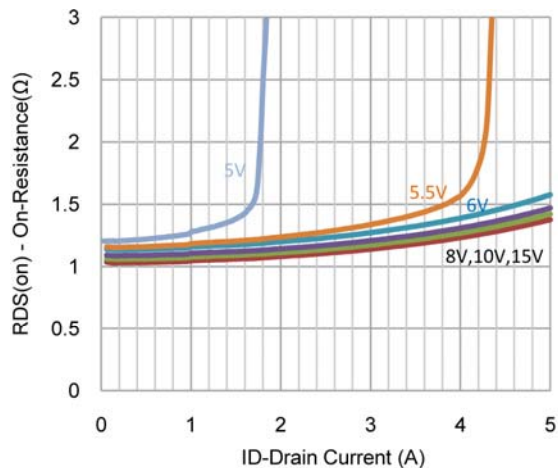
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ C$ unless otherwise specified)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	2	-	4	V	$V_{DS} = V_{GS}, I_D = 250 \mu A$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS} = 0V, V_{GS} = \pm 20V$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	25	μA	$V_{DS} = 500V, V_{GS} = 0V$
		-	-	250		$V_{DS} = 400V, V_{GS} = 0V, T_J = 125^\circ C$
On-State Drain Current ¹	$I_{D(on)}$	5	-	-	A	$V_{DS} = 10V, V_{GS} = 10V$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	1500	m Ω	$V_{GS} = 10V, I_D = 2.7 A$
Forward Transconductance ¹	g_{fs}	-	2.5	-	S	$V_{DS} = 50V, I_D = 2.7 A$
Diode Forward Voltage	V_{SD}	-	1.6	-	V	$I_S = 4.5 A, V_{GS} = 0 V$
Dynamic ²						
Total Gate Charge	Q_g	-	26	-	nC	$V_{DS} = 400 V$ $V_{GS} = 10 V$ $I_D = 3.1 A$
Gate-Source Charge	Q_{gs}	-	4	-		
Gate-Drain Charge	Q_{gd}	-	15	-		
Turn-on Delay Time	$T_{d(on)}$	-	12.8	-	nS	$V_{DD} = 250 V$ $I_D = 3.1 A$ $V_{GEN} = 10 V$ $R_L = 79 \Omega$ $R_{GEN} = 12 \Omega$
Rise Time	T_r	-	7.4	-		
Turn-off Delay Time	$T_{d(off)}$	-	38	-		
Fall Time	T_f	-	19.6	-		
Input Capacitance	C_{ISS}	-	623	-	pF	$V_{DS} = 25 V$ $V_{GS} = 0 V$ $f = 1MHz$
Output Capacitance	C_{OSS}	-	112	-		
Reverse Transfer Capacitance	C_{RSS}	-	24	-		

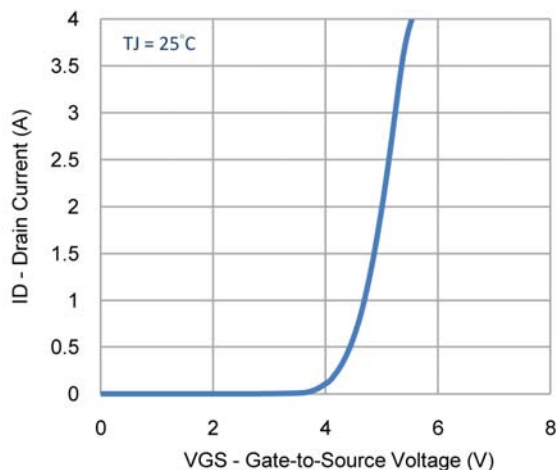
Notes

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

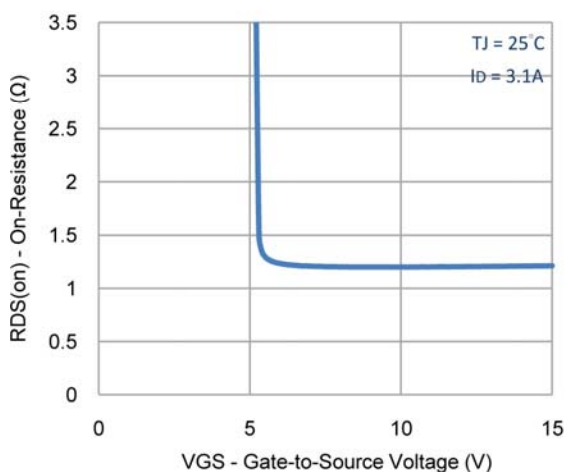
CHARACTERISTIC CURVE



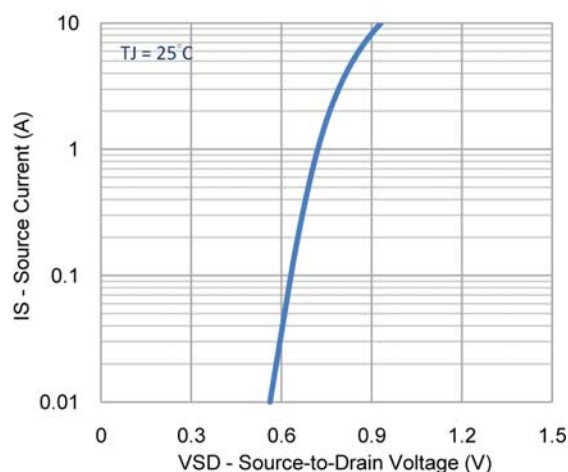
1. On-Resistance vs. Drain Current



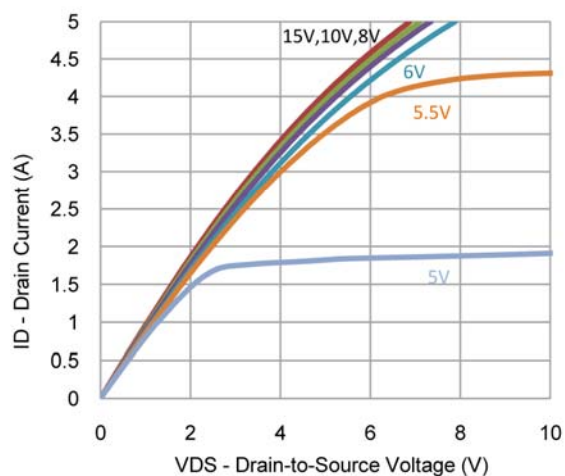
2. Transfer Characteristics



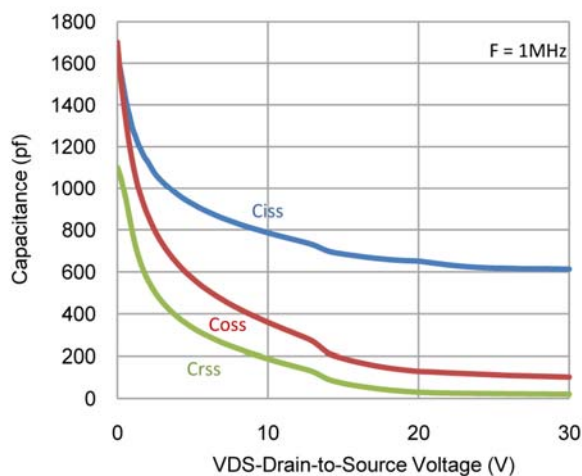
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

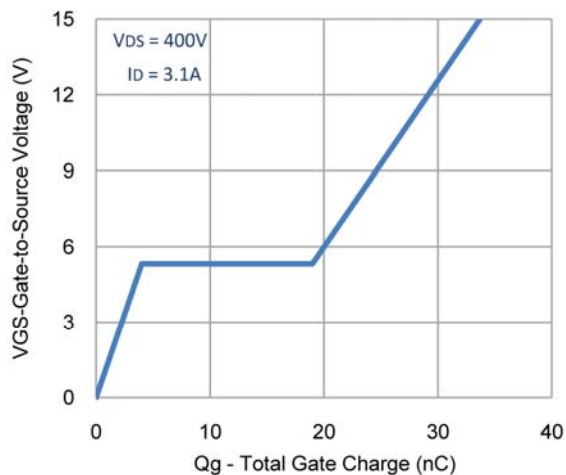


5. Output Characteristics

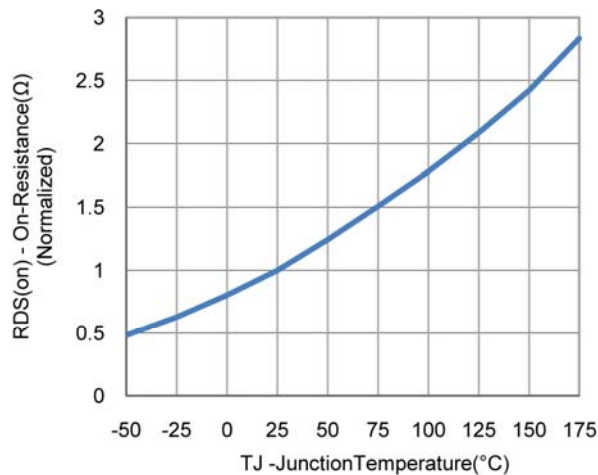


6. Capacitance

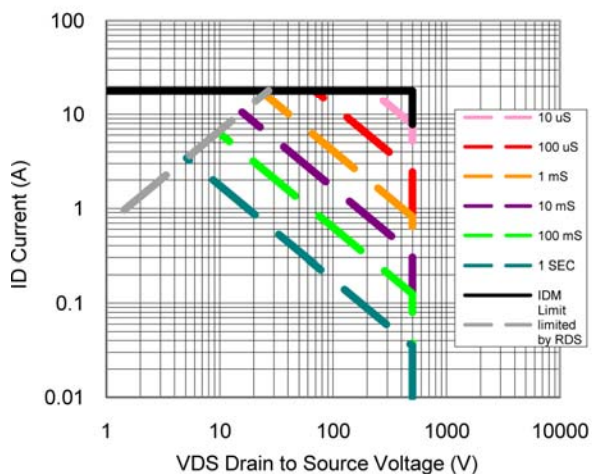
CHARACTERISTIC CURVE



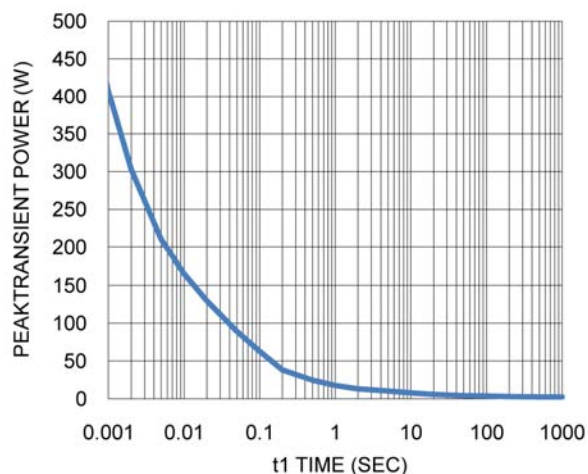
7. Gate Charge



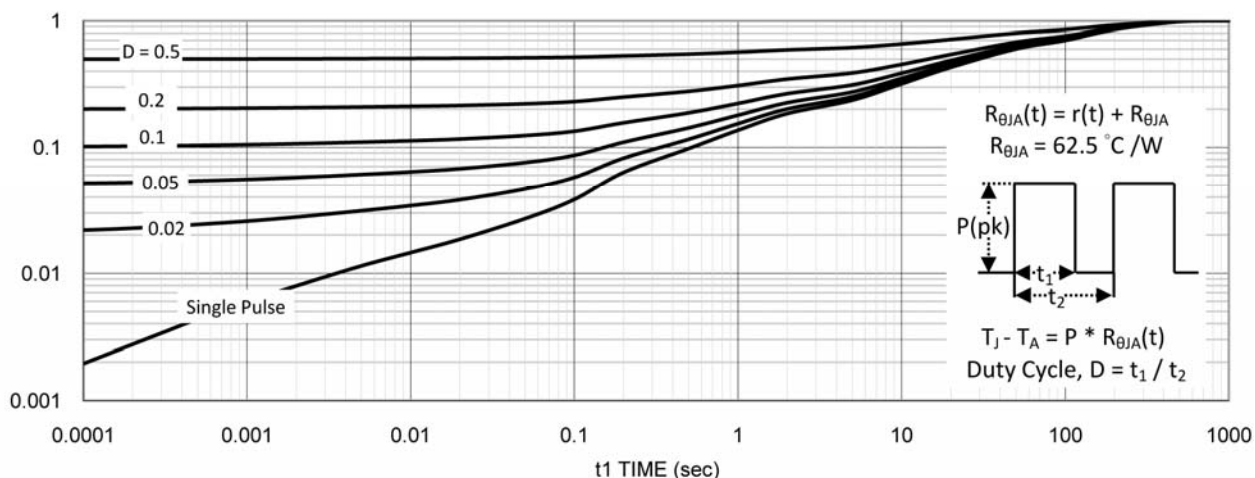
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient