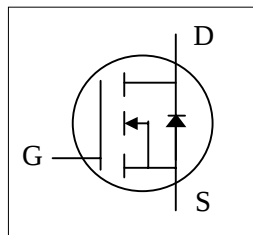


N-CHANNEL ENHANCEMENT MODE POWER MOSFET

PRODUCT SUMMARY

Lower On-resistance
Fast Switching Characteristic
Simple Drive Requirement
RoHS Compliant



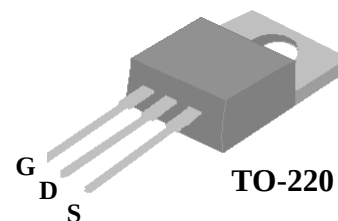
BV_{DSS}	650V
$R_{DS(ON)}$	1Ω
I_D	10A

DESCRIPTION

The TO-220 package is universally preferred for all commercial-industrial applications. The device is suited for DC-DC ,AC-DC converters for power applications.



Pb-free; RoHS-compliant



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	10	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	4.4	A
I_{DM}	Pulsed Drain Current ¹	18	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	104	W
	Linear Derating Factor	0.8	W/ $^\circ\text{C}$
I_{AR}	Avalanche Current	10	A
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

THERMAL DATA

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-case Max.	1.2	$^\circ\text{C}/\text{W}$
Rthj-a	Thermal Resistance Junction-ambient Max.	62	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS @T_j=25°C(unless otherwise specified)

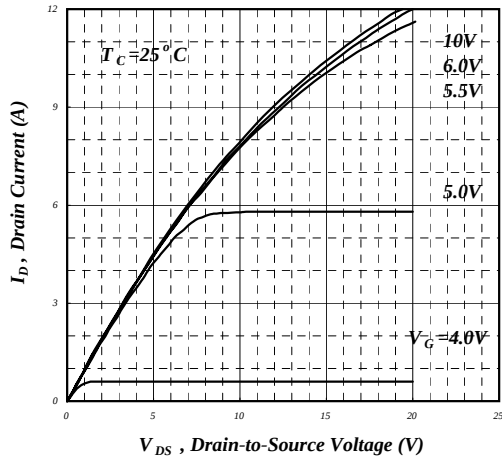
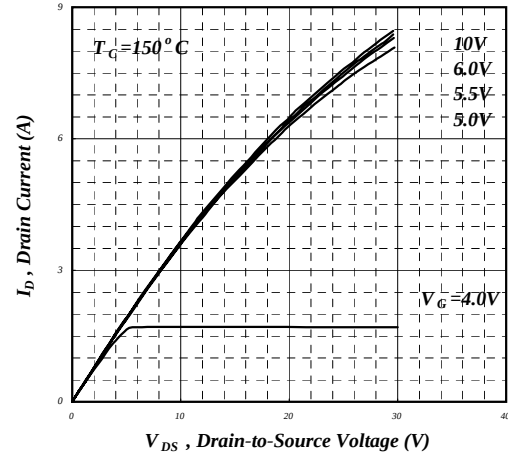
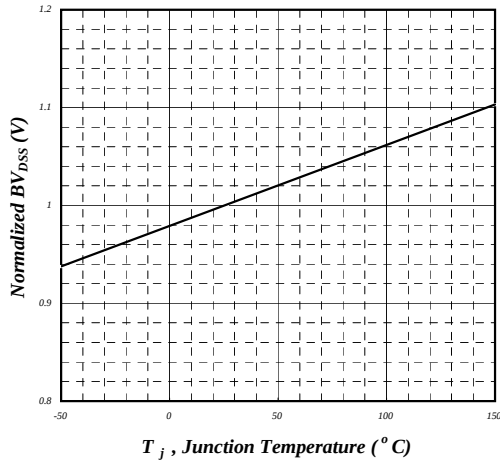
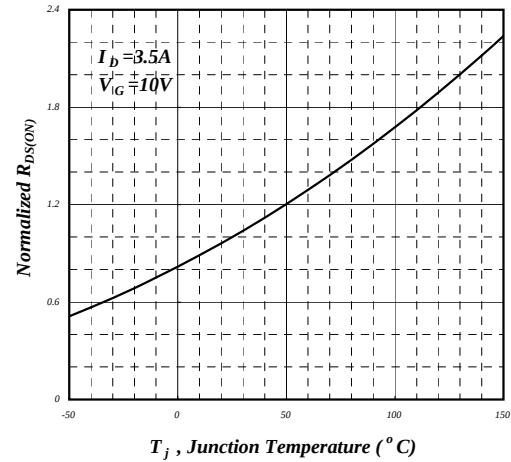
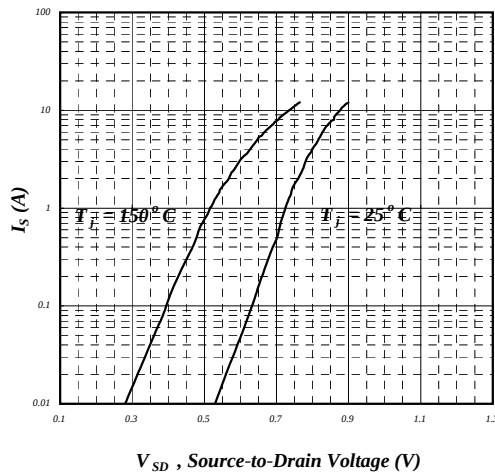
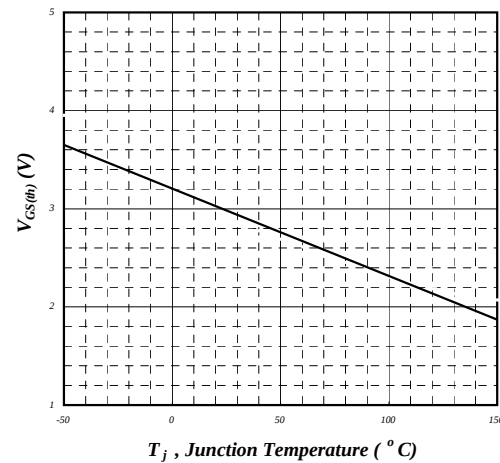
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =1mA	650	-	-	V
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.6	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =3.5A	-	-	1	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	4	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3.5A	-	4.5	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =600V, V _{GS} =0V	-	-	10	uA
	Drain-Source Leakage Current (T _j =150°C)	V _{DS} =480V, V _{GS} =0V	-	-	100	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±30V	-	-	±100	nA
Q _g	Total Gate Charge ³	I _D =10A	-	53	85	nC
Q _{gs}	Gate-Source Charge	V _{DS} =520V	-	10	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	15	-	nC
t _{d(on)}	Turn-on Delay Time ³	V _{DD} =320V	-	16	-	ns
t _r	Rise Time	I _D =10A	-	20	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =10Ω, V _{GS} =10V	-	82	-	ns
t _f	Fall Time	R _D =32Ω	-	36	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	2770	4430	pF
C _{oss}	Output Capacitance	V _{DS} =15V	-	320	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	8	-	pF

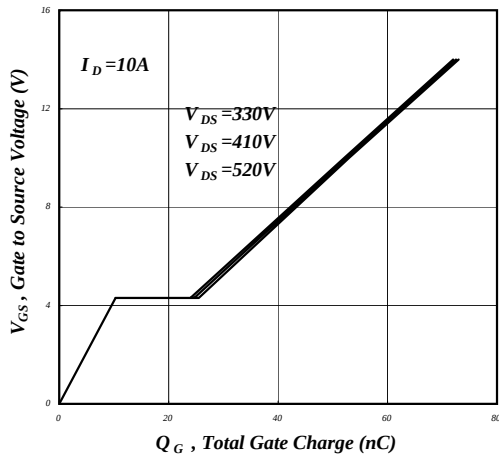
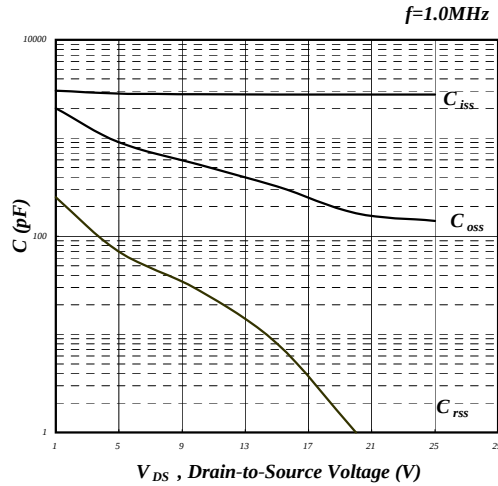
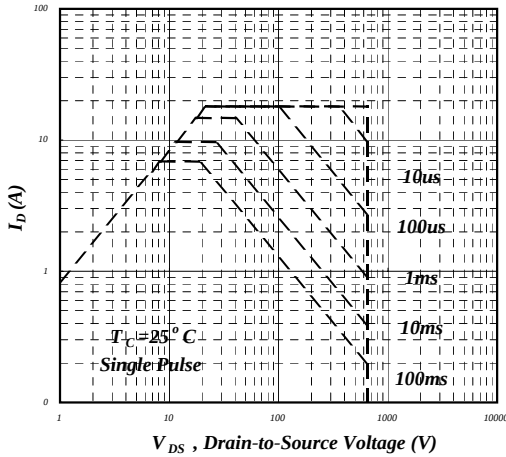
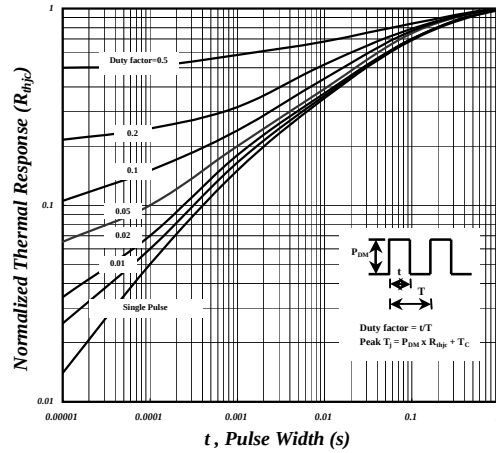
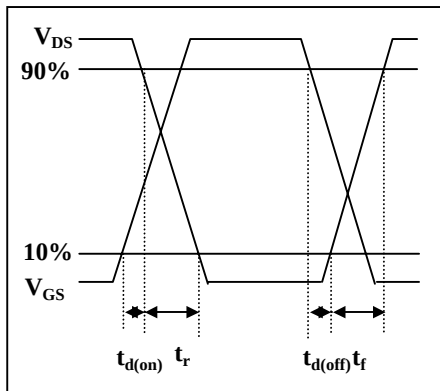
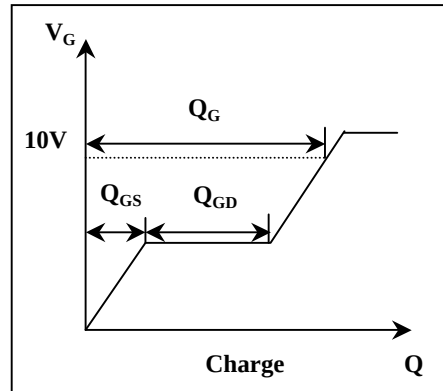
Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ³	I _S =10A, V _{GS} =0V	-	-	1.5	V
t _{rr}	Reverse Recovery Time ³	I _S =10A, V _{GS} =0V,	-	610	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	8.64	-	μC

Notes:

1. Pulse width limited by safe operating area.
2. Starting T_j=25°C, V_{DD}=50V, L=1.2mH, R_G=25Ω, I_{AS}=10A.
3. Pulse width ≤300us, duty cycle ≤2%.


Fig 1. Typical Output Characteristics

Fig 2. Typical Output Characteristics

Fig 3. On-Resistance v.s. Gate Voltage

Fig 4. Normalized On-Resistance v.s. Junction Temperature

Fig 5. Forward Characteristic of Reverse Diode

Fig 6. Gate Threshold Voltage v.s. Junction Temperature


Fig 7. Gate Charge Characteristics

Fig 8. Typical Capacitance Characteristics

Fig 9. Maximum Safe Operating Area

Fig 10. Effective Transient Thermal Impedance

Fig 11. Switching Time Waveform

Fig 12. Gate Charge Waveform

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