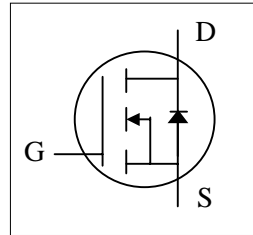


N-CANNEL ENHANCEMENT MODE POWER MOSFET

PRODUCT SUMMARY

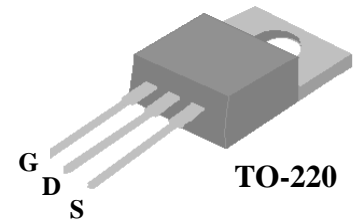
Lower On-resistance
Fast Switching Characteristic
Simple Drive Requirement
RoHS Compliant



BV_{DSS}	650V
$R_{DS(ON)}$	1 Ω
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
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	10	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	4.4	A
I_{DM}	Pulsed Drain Current ¹	18	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	104	W
	Linear Derating Factor	0.8	W/ $^\circ C$
I_{AR}	Avalanche Current	10	A
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

THERMAL DATA

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

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%.

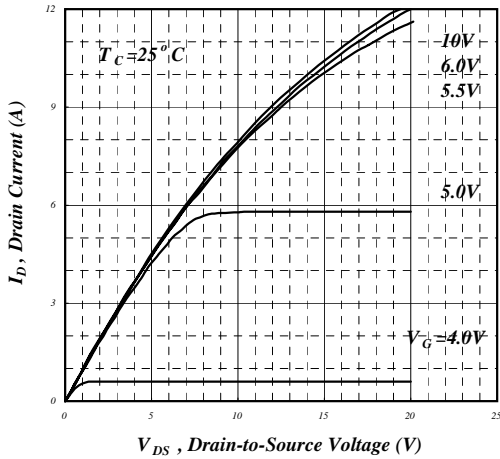


Fig 1. Typical Output Characteristics

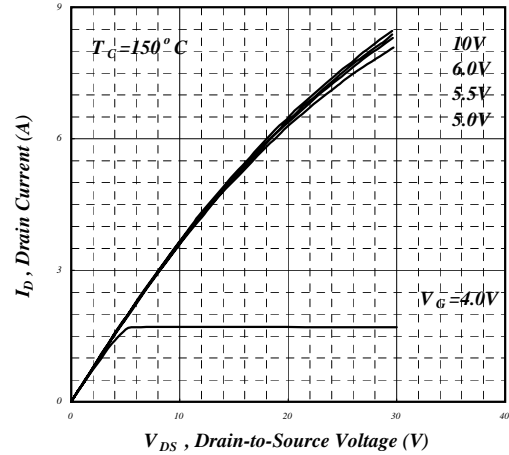


Fig 2. Typical Output Characteristics

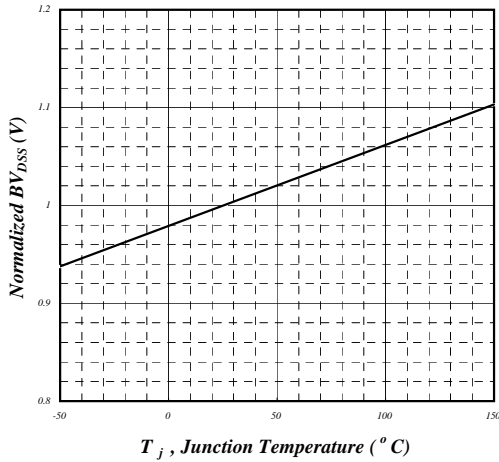


Fig 3. On-Resistance v.s. Gate Voltage

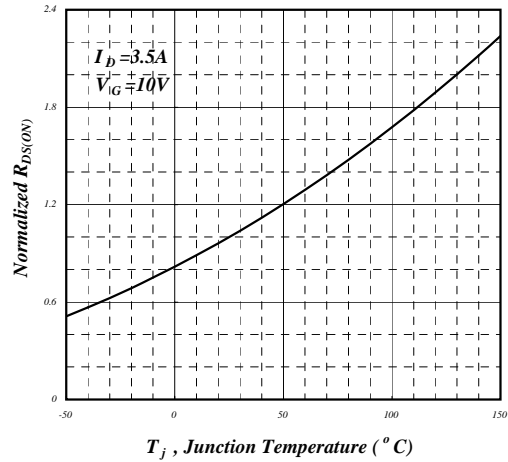


Fig 4. Normalized On-Resistance v.s. Junction Temperature

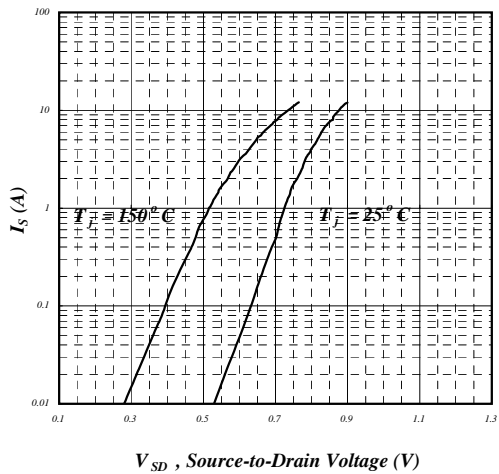


Fig 5. Forward Characteristic of Reverse Diode

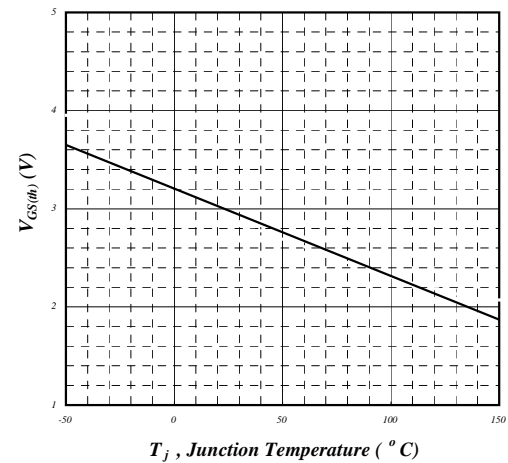


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

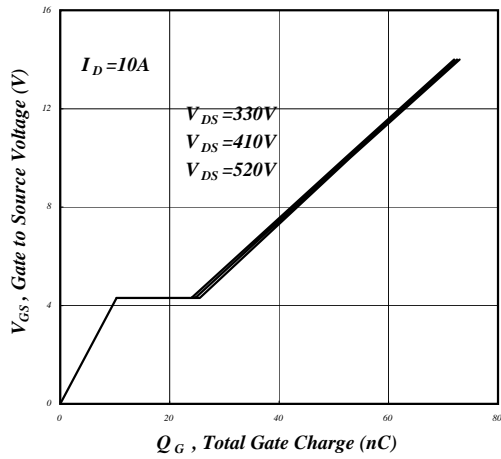


Fig 7. Gate Charge Characteristics

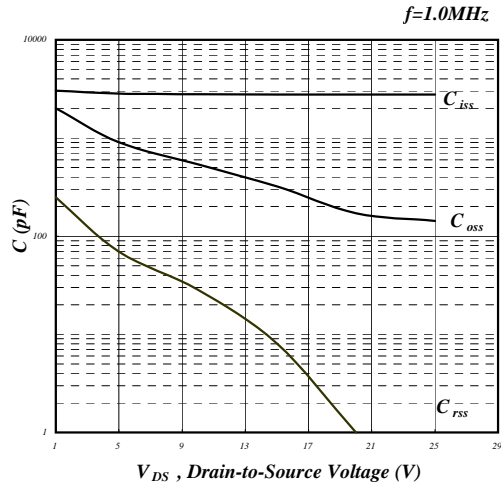


Fig 8. Typical Capacitance Characteristics

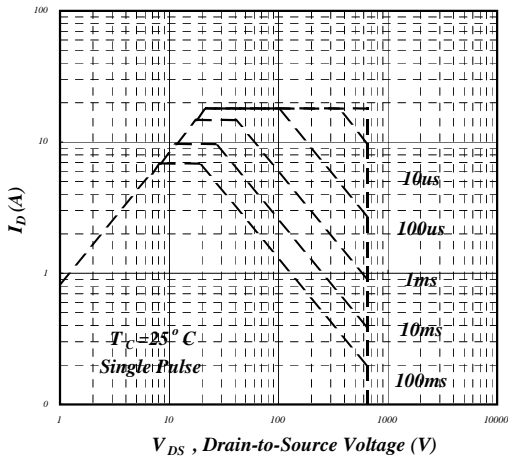


Fig 9. Maximum Safe Operating Area

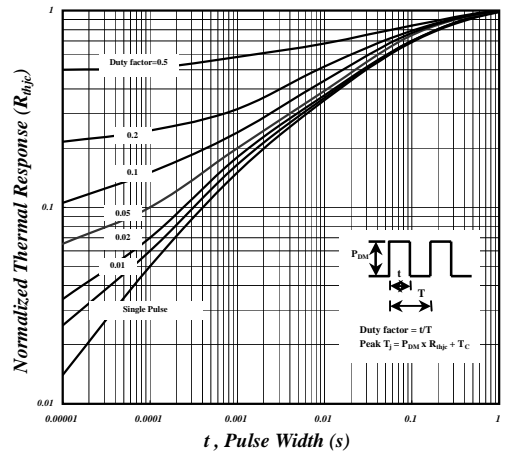


Fig 10. Effective Transient Thermal Impedance

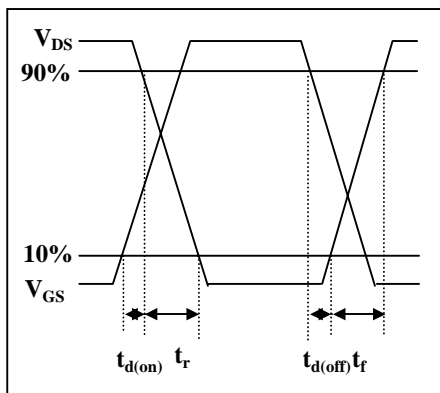


Fig 11. Switching Time Waveform

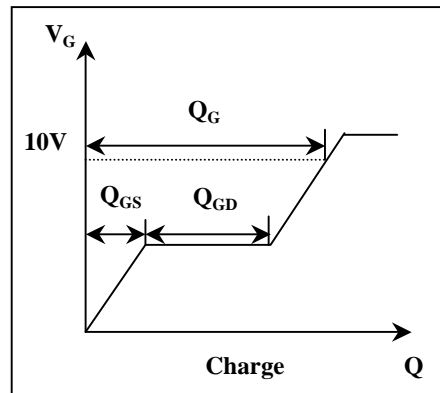


Fig 12. Gate Charge Waveform

Information furnished by Silicon Standard Corporation is believed to be accurate and reliable. However, Silicon Standard Corporation makes no guarantee or warranty, expressed or implied, as to the reliability, accuracy, timeliness or completeness of such information and assumes no responsibility for its use, or for infringement of any patent or other intellectual property rights of third parties that may result from its use. Silicon Standard reserves the right to make changes as it deems necessary to any products described herein for any reason, including without limitation enhancement in reliability, functionality or design. No license is granted, whether expressly or by implication, in relation to the use of any products described herein or to the use of any information provided herein, under any patent or other intellectual property rights of Silicon Standard Corporation or any third parties.