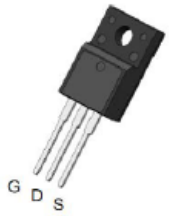
-40V P-Channel MOSFET

DESCRIPTION：

·Fast Switching
·Very low on-resistance
·Enhancement mode
·100% Avalanche Tested
·100% AVds Tested
·Halogen-free and RoHS-compliant

V_{DSS}	-40V
I_D @VGS=-10V	-77A
$R_{DS(ON)_Typ.}$ @V_{GS}=-10V	7.0mΩ



ITO-220

TYPICAL APPLICATIONS：
·PWM Applications
·Load Switch
·Power Management

MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-40	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (1) T_C = 25℃ T_C = 100℃	I_D	 -77 -49	A
Pulsed Drain Current, tp<10us(2)	I_{DM}	-306	A
Avalanche Current(3)	I_{AS}	-20.6	A
Single Pulsed Avalanche Energy(3)	E_{AS}	212	mJ
Power dissipation T_C = 25℃ T_C = 100℃	P_D	 63 25	mW
Junction & Storage temperature Range	T_J, T_{STG}	-55~+150	℃
Thermal Resistance, Junction to Ambient Thermal Resistance, Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	46 1.7	℃/W

Notes： 1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro mechanical application board design.
2.This single pulse measurement was taken under T_{J_Max}
3.This single pulse measurement was taken under the following condition [L = 1mH, V_{GS} = 10V, V_{DS} = 20V] while its value is limited by T_{J_Max}.

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	-40			V
Zero Gate Voltage Drain Current VDS = -40 V, VGS = 0 V	I_{DSS}			-1.0	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			-100	nA
Gate-Source threshold voltage VDS = VGS, ID = -250uA	$V_{GS(th)}$	-1.0	-1.7	-2.5	V
Drain-Source On-State Resistance VGS = -10V, ID = -30A VGS = -4.5V, ID = -20A	$R_{DS(on)}$		7.0 10.3	8.3 13.4	mΩ
Input capacitance f=1MHz, VDS=-20 V, VGS=0 V	C_{iss}		1511		pF
Output capacitance f=1MHz, VDS=-20 V, VGS=0 V	C_{oss}		1077		pF
Reverse transfer capacitance f=1MHz, VDS=-20 V, VGS=0 V	C_{rss}		70		pF
Gate Resistance VGS = 0V, VDS= 0V, f = 1MHz	R_G		12.0		Ω
Total Gate Charge VDS =-20V, ID =-20A,VGS =0 to -10V	Qg		24		nC
Gate-Source Charge VDS =-20V, ID =-20A,VGS =0 to -10V	Qgs		4.4		nC
Gate-Drain(“Miller”) Charge VDS =-20V, ID =-20A,VGS =0 to -10V	Qgd		3.8		nC
Turn-on delay time VDS= -20V, VGS= -10V, ID=-20A, R_{GEN}=3Ω	td (ON)		5.6		ns
Rise time VDS= -20V, VGS= -10V, ID=-20A, R_{GEN}=3Ω	tr		13		ns
Turn-off delay time VDS= -20V, VGS= -10V, ID=-20A, R_{GEN}=3Ω	td (OFF)		47		ns
Fall time VDS= -20V, VGS= -10V, ID=-20A, R_{GEN}=3Ω	tf		26		ns
Maximum Continuous Drain to Source Diode Forward Current	I_S			-77	A
Drain to Source Diode Forward Voltage VGS = 0V, IS =-20A	V_{SD}		-0.7	-1.2	V
Reverse Recovery Time I_S=-20A,di/dt=-100A/μs, T_J=25℃	Trr		38		nS
Reverse Recovery Charge I_S=-20A,di/dt=-100A/μs, T_J=25℃	Qrr		25.0		nC

Typical Performance Characteristics

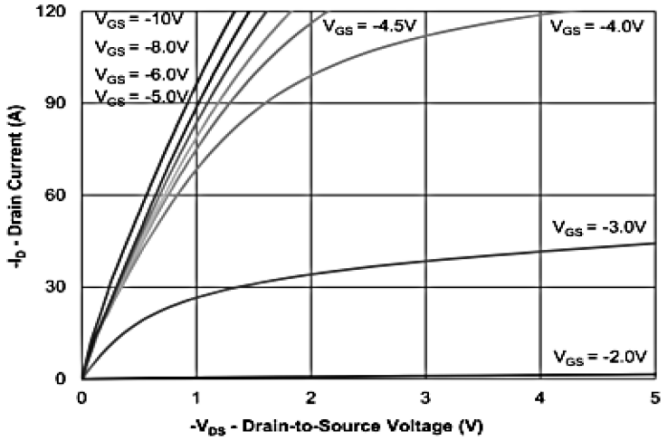


Figure 1. Output Characteristics

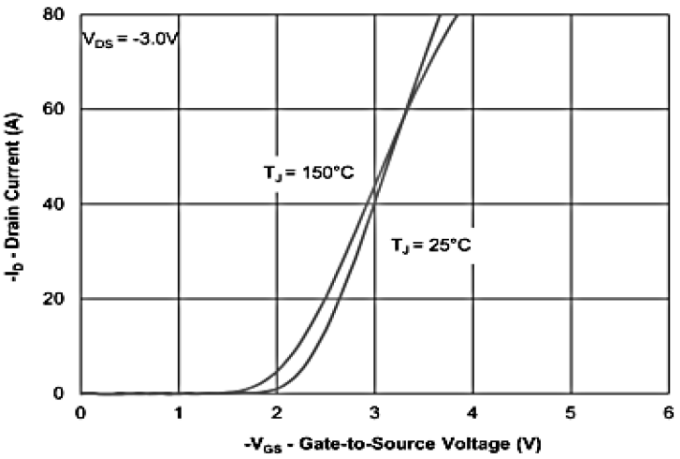


Figure 2. Transfer Characteristics

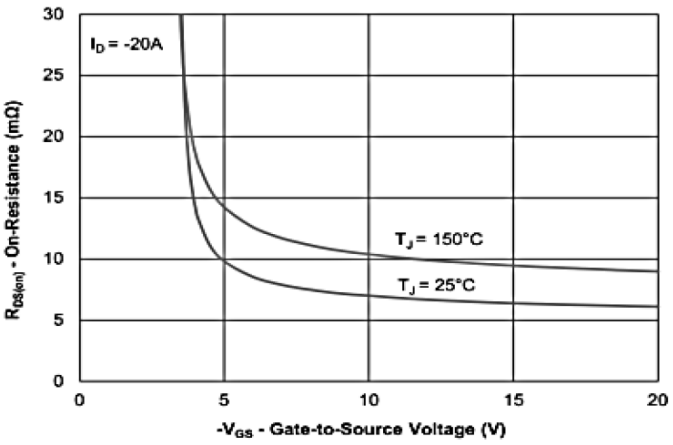


Figure 3. On-Resistance vs. Gate-Source Voltage

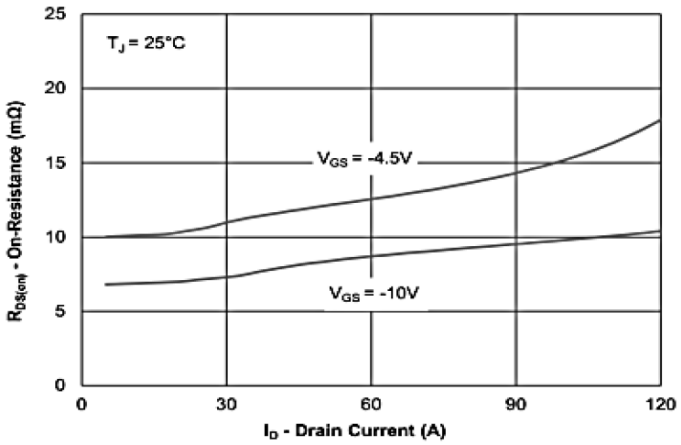


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

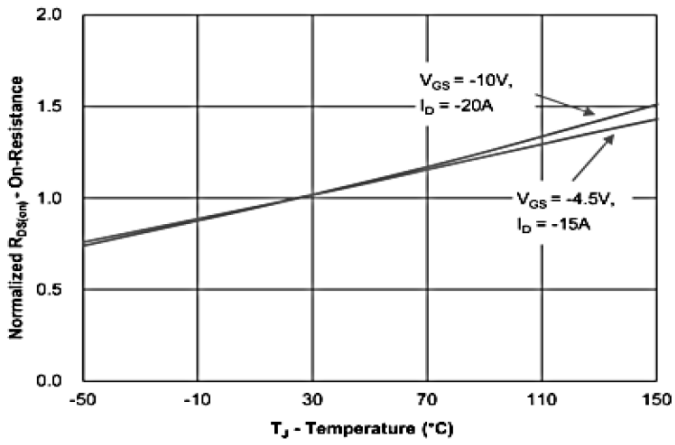


Figure 5. On-Resistance vs. Junction Temperature

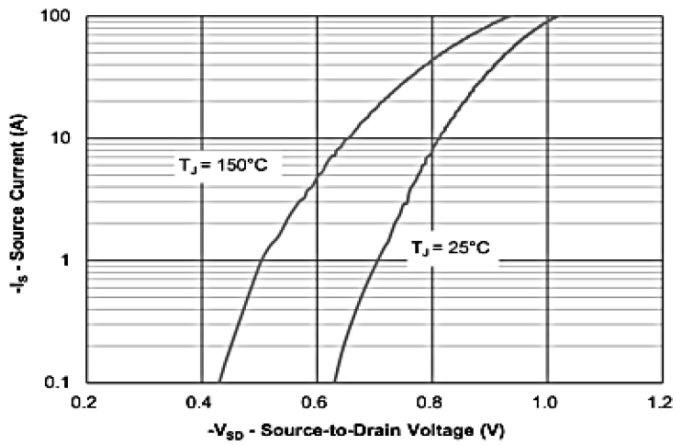


Figure 6. Source-Drain Diode Forward Voltage

Typical Performance Characteristics

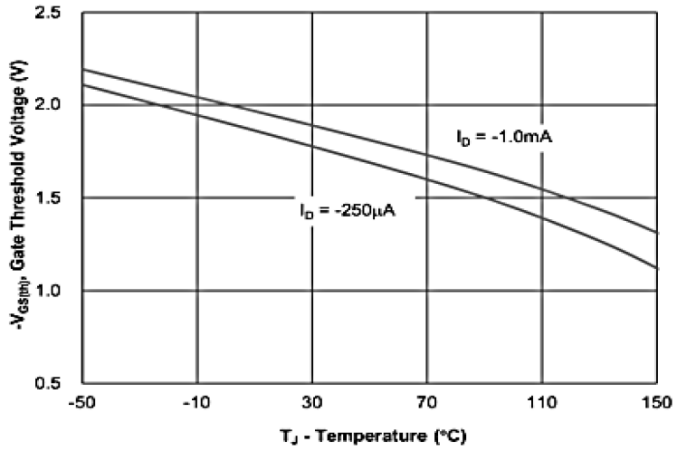


Figure 7. Gate Threshold Variation vs. Junction Temperature

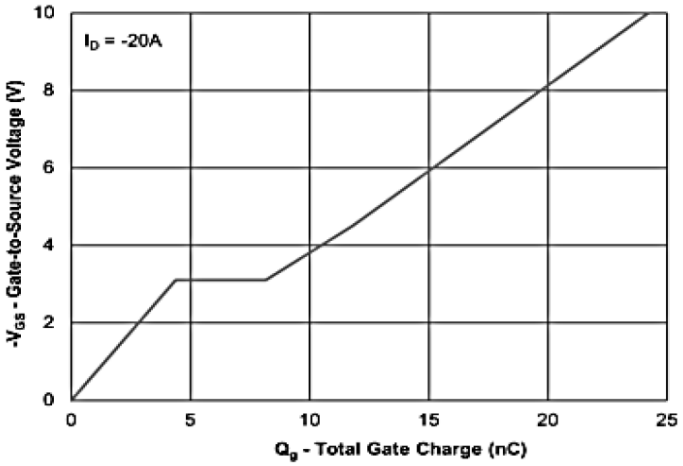


Figure 8. Gate Charge Characteristics

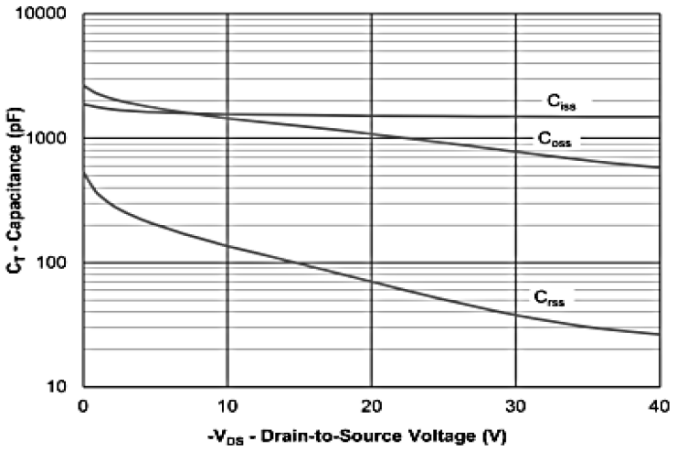


Figure 9. Capacitance Characteristics

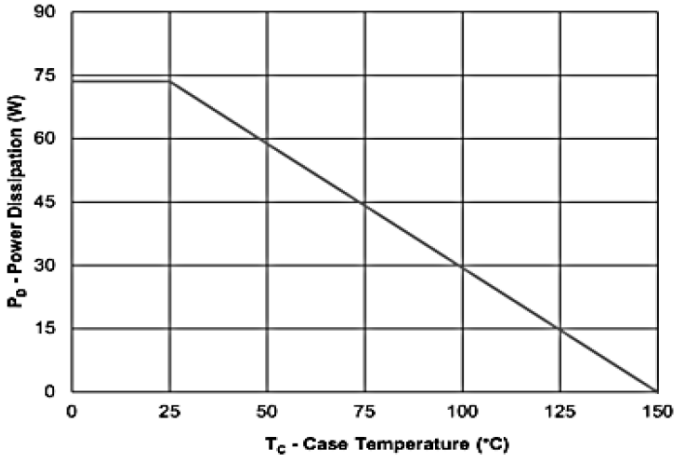


Figure 10. Power Derating

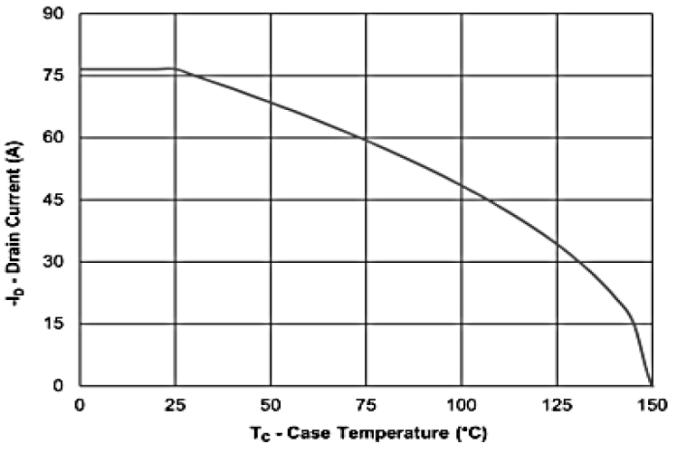


Figure 11. Current Derating

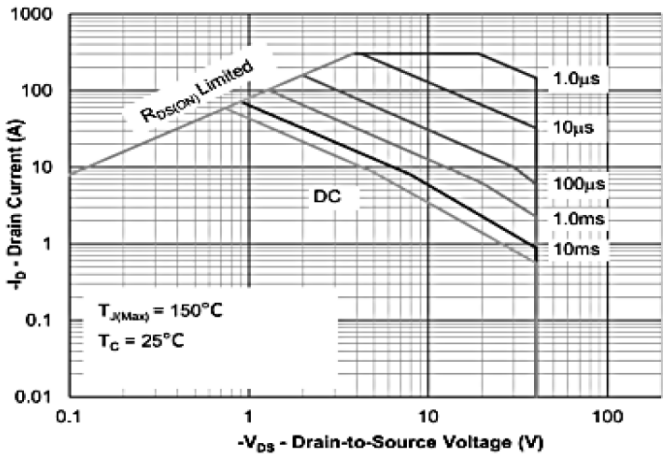


Figure 12. Safe Operating Area

Typical Performance Characteristics

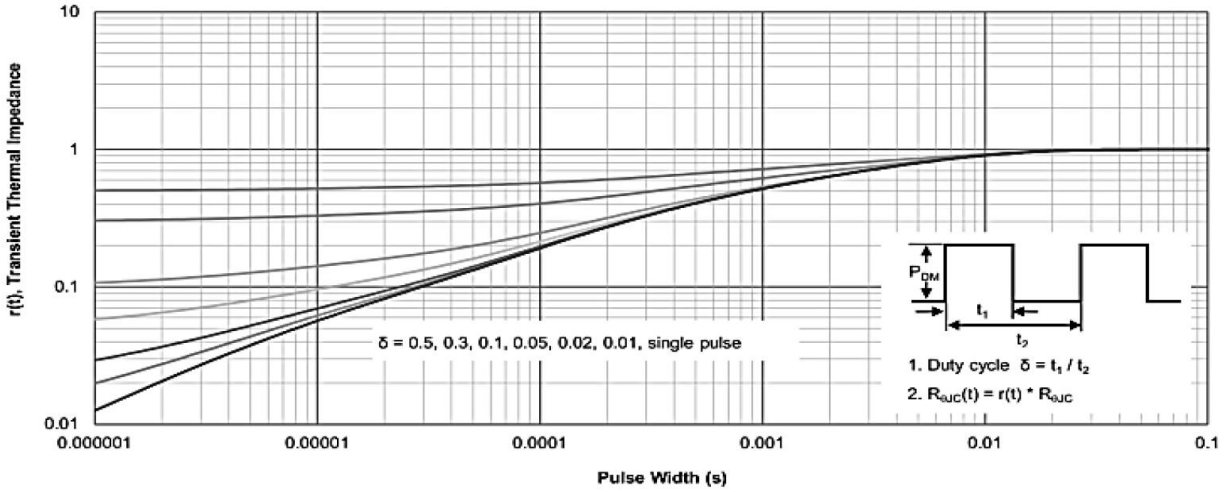
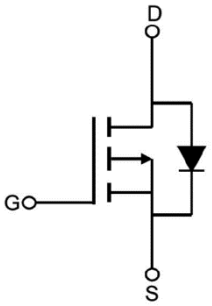
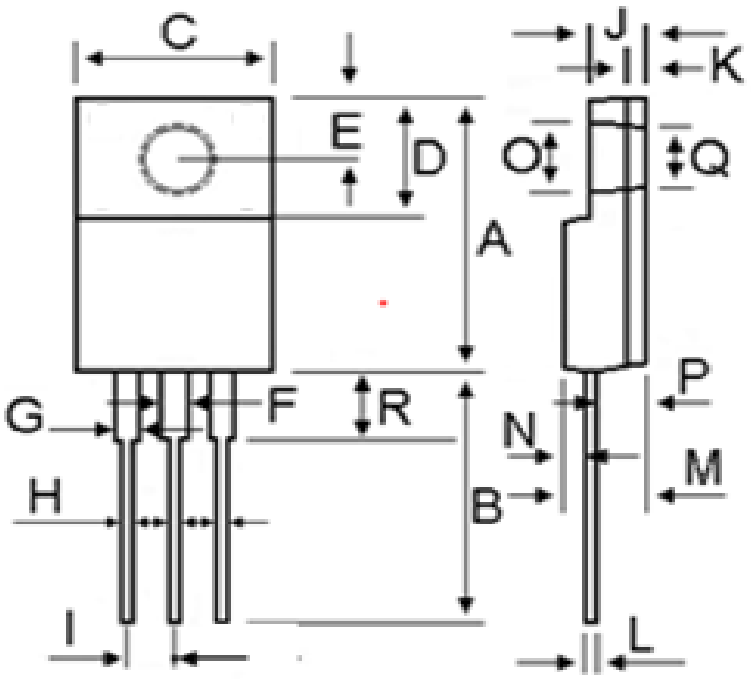


Figure 13. Normalized Maximum Transient Thermal Impedance

·Circuit diagram



·Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	14.80	16.10
B	12.65	14.40
C	9.70	10.40
D	4.60	6.80
E	2.50	3.50
F	0.90	1.70
G	0.90	1.70
H	0.50	0.90
I	2.40	2.70
J	2.34	3.30
K	0.55	1.30
L	0.36	0.80
M	4.20	4.90
N	1.10	1.80
O	2.90	3.50
P	2.30	3.15
Q	2.90	3.50
R	2.45	4.85

Notice

MOSPEC reserves the rights to make changes of the content herein the document anytime without notification. MOSPEC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies. Please refer to MOSPEC website for the last document.

MOSPEC disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially incurred.

Application shown on the herein document are examples of standard use and operation. Customers are responsible for comprehending suitable use in particular applications. MOSPEC makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by MOSPEC for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of MOSPEC or others.

These MOSPEC products are intended for usage in general electronic equipment. Please make sure to consult with MOSPEC before you use these MOSPEC products in equipment which require specialized quality and/or reliability, and in equipment which could have major impact to the welfare of human life (atomic energy control, aeronautics , traffic control, combustion control, safety devices etc.)