MOSPEC

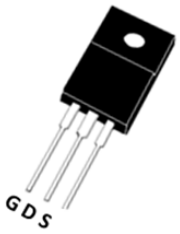
10N650F

650V N-Channel Power MOSFET

V_{DS}	650V
I_D (Tc=25℃)	10A
$R_{DS(ON)\_MAX}$ @V_{GS}=10V	0.95Ω

DESCRIPTION：
- Fast Switching
- Improved dv/dt Capability
- 100% UIS Tested, 100%ΔVds Tested
- Fast Recovery Body Diode
- RoHS compliant
- Pb-Free Lead Plating

TYPICAL APPLICATIONS：
- Power Management
- Load Switch
- PWM Application



ITO-220AB

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

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	10 6	A
Pulsed Drain Current (1)		I_{DM}	40	A
Single Pulsed Avalanche Energy (2)		E_{AS}	405	mJ
Power dissipation	Tc=25℃	P_D	29	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes： 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. EAS condition: Starting TJ=25C, VDD=50V, VG=10V, RG=25ohm, L=10mH, IAS=9A

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	55 4.3	℃/W

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	650			V
Zero Gate Voltage Drain Current VDS = 650 V, VGS = 0 V	I_{DSS}			1	uA
Gate-Source Leakage Current VGS = ±30V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	2.0	3.0	4.0	V
Drain-Source On-State Resistance VGS = 10V, ID = 5A	$R_{DS(on)}$		0.84	0.95	Ω
Input capacitance f=1MHz, VDS=25 V, VGS=0 V	C_{iss}		1560		pF
Output capacitance f=1MHz, VDS=25 V, VGS=0 V	C_{oss}		136		pF
Reverse transfer capacitance f=1MHz, VDS=25 V, VGS=0 V	C_{rss}		19		pF
Total Gate Charge VDS= 520V, ID= 10A,VGS=0 to 10V	Q_G		37		nC
Gate to Source Charge VDS= 520V, ID= 10A,VGS=0 to 10V	Q_{GS}		8		nC
Gate to Drain Charge VDS= 520V, ID= 10A,VGS=0 to 10V	Q_{GD}		15		nC
Turn-on delay time VDD= 310V, VGS= 10V, ID= 10A, R_{GEN}=24Ω	$td_{(ON)}$		23		ns
Rise time VDD= 310V, VGS= 10V, ID= 10A, R_{GEN}=24Ω	tr		37		ns
Turn-off delay time VDD= 310V, VGS= 10V, ID= 10A, R_{GEN}=24Ω	$td_{(OFF)}$		104		ns
Fall time VDD= 310V, VGS= 10V, ID= 10A, R_{GEN}=24Ω	tf		45		ns

Body Diode

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage VGS = 0V, I_S = 10A	V_{SD}			1.2	V
Maximum Continuous Drain to Source Diode Forward Current	I_S			10	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}			40	A
Revers Recovery Time IF=10A, di/dt = 100A/us	Trr		423		ns
Revers Recovery Charge IF=10A, di/dt = 100A/us	Qrr		4.4		uC

Typical Performance Characteristics

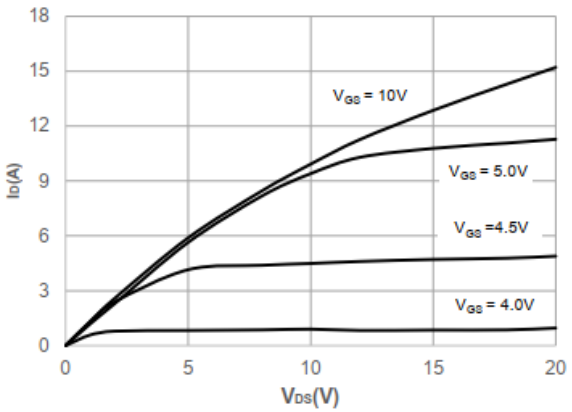


Figure 1. Output Characteristics

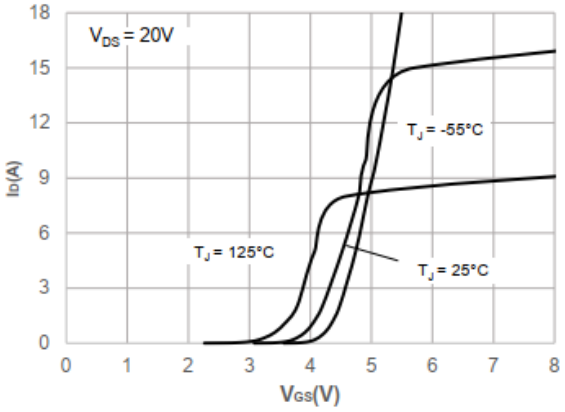


Figure 2. Typical Transfer Characteristics

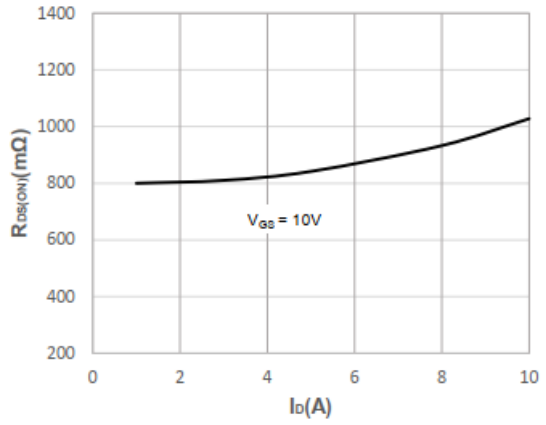


Figure 3. On-resistance vs. Drain Curren

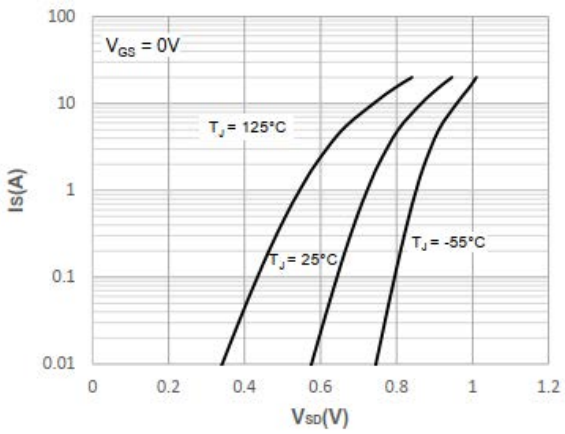


Figure 4. Body Diode Characteristics

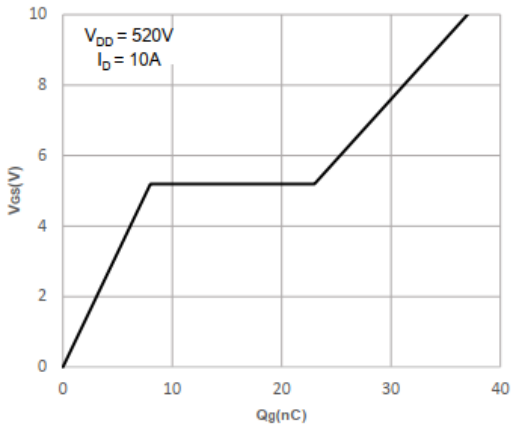


Figure 5. Gate Charge Characteristics

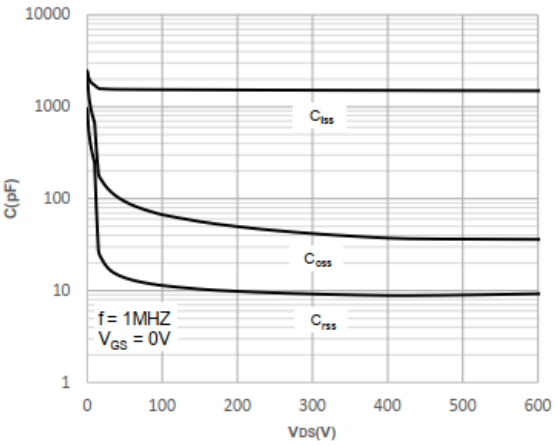


Figure 6. Capacitance Characteristics

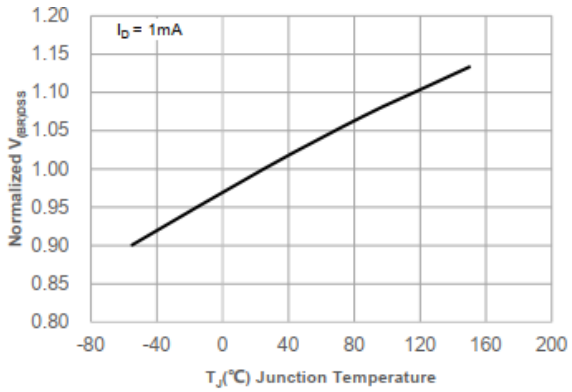


Figure 7. Normalized Breakdown voltage vs. Junction Temperature

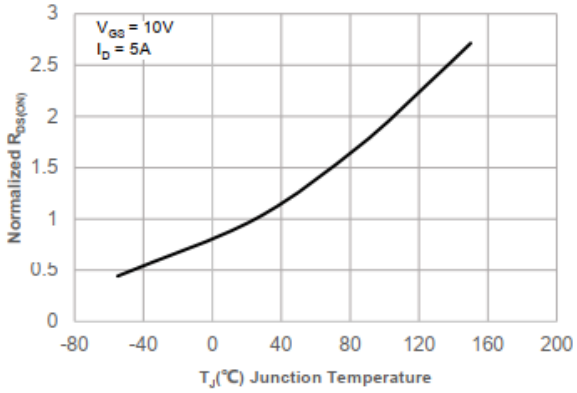


Figure 8. Normalized on Resistance vs. Junction Temperature

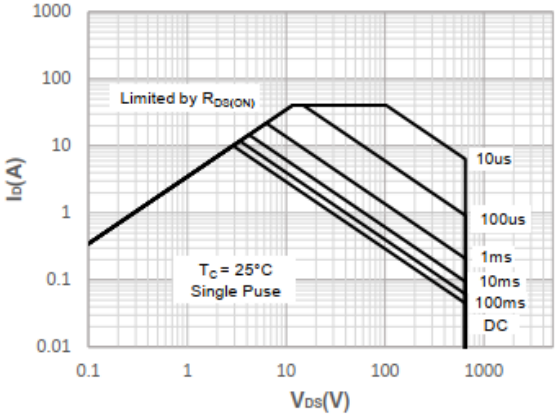


Figure 9. Maximum Safe Operating Area

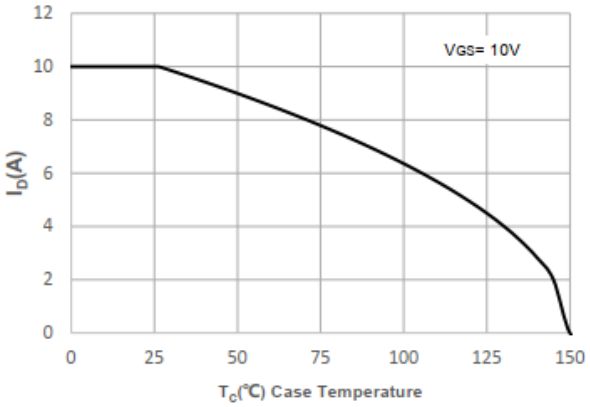


Figure 10. Maximum Continuous Drian Current vs. Case Temperature

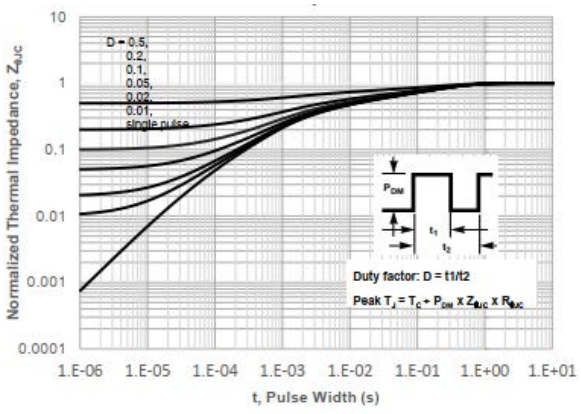


Figure 11. Normalized Maximum Transient Thermal Impedance

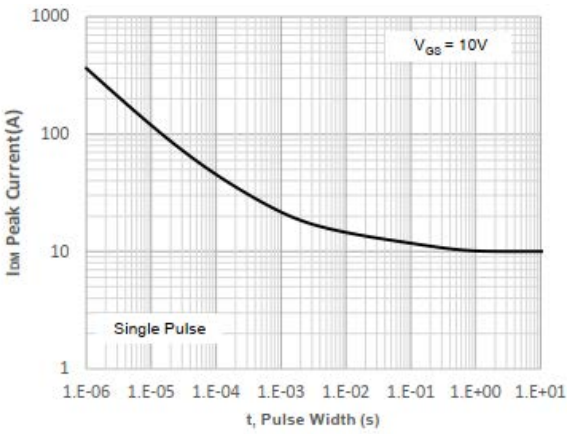
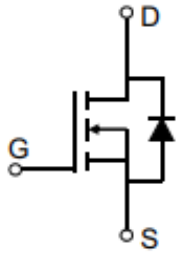
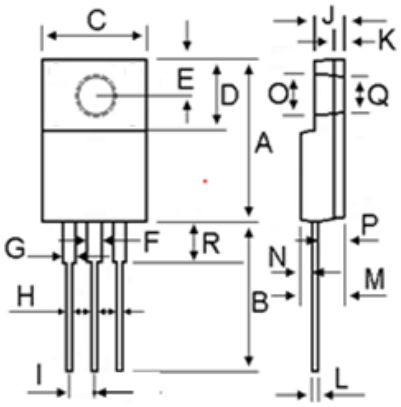


Figure 12. Peak Current Capacity

・Circuit diagram



・Package outlines :



DIM	MILLIMETERS	
	MIN	MAX
A	14.80	16.10
B	12.65	14.40
C	9.70	10.36
D	4.60	6.80
E	2.50	3.50
F	0.90	1.55
G	0.90	1.55
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	2.80	4.85

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