

650V N-Channel Power MOSFET

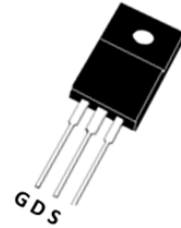
DESCRIPTION :

- Excellent $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% ΔV_{ds} Tested
- Pb-Free Lead Plating
- RoHS compliant
- Halogen Free

V_{DSS}	650V
$I_D @ V_{GS}=10V$	16A
$R_{DS(ON)_{Typ.}} @ V_{GS}=10V$	90m Ω

TYPICAL APPLICATIONS :

- SMPS with PFC
- Flyback and LLC topologies
- Silver ATX, adapter, TV, lighting, Telecom



ITO-220AB

MAXIMUM RATINGS (at $T_C = 25^\circ C$, 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	$T_C=25^\circ C$ $T_C=100^\circ C$	I_D	16 10	A
Pulsed Drain Current ⁽¹⁾		I_{DM}	Refer to Fig4	A
Single Pulsed Avalanche Energy ⁽²⁾		E_{AS}	259	mJ
Power dissipation	$T_C=25^\circ C$ $T_C=100^\circ C$	P_D	72 29	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	$^\circ C$

- Notes : 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. EAS condition: Starting $T_J=25^\circ C$, $V_{DD}=75V$, $V_G=10V$, $R_G=25\Omega$, $L=10mH$, $I_{AS}=7.2A$, $V_{DD}=0V$ during time in avalanche.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	77 1.7	$^\circ C/W$

ELECTRICAL CHARACTERISTICS (at $T_J = 25\text{ }^\circ\text{C}$, 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}			10	uA
Gate-Source Leakage Current VGS = $\pm 30\text{V}$, VDS = 0V	I_{GSS}			± 100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	2.3	3.3	4..3	V
Drain-Source On-State Resistance VGS = 10V, ID = 10A	$R_{DS(on)}$		90	110	m Ω
Input capacitance f=1MHz, VDS=325 V, VGS=0 V	C_{iss}		2173	2934	pF
Output capacitance f=1MHz, VDS=325 V, VGS=0 V	C_{oss}		51	69	pF
Reverse transfer capacitance f=1MHz, VDS=325 V, VGS=0 V	C_{rss}		6.6		pF
Gate Resistance f=1MHz	R_g		4.8		Ω
Total Gate Charge VDS= 325V, ID= 10A,VGS= 0 to 10V	Q_G		47	63	nC
Gate to Source Charge VDS= 325V, ID= 10A,VGS= 0 to 10V	Q_{GS}		14	19	nC
Gate to Drain Charge VDS= 325V, ID= 10A,VGS= 0 to 10V	Q_{GD}		16	22	nC
Turn-on delay time VDD=325 V, VGS= 10V, ID= 10A, RGEN=24 Ω	$t_{d(ON)}$		46		ns
Rise time VDD=325 V, VGS= 10V, ID= 10A, RGEN=24 Ω	t_r		38		ns
Turn-off delay time VDD=325 V, VGS= 10V, ID= 10A, RGEN=24 Ω	$t_{d(OFF)}$		157		ns
Fall time VDD=325 V, VGS= 10V, ID= 10A, RGEN=24 Ω	t_f		34		ns

Body Diode

ELECTRICAL CHARACTERISTICS (at $T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage $V_{GS} = 0V, I_S = 10A$	V_{SD}			1.2	V
Maximum Continuous Body Diode Forward Current	I_S			16	A
Maximum Pulsed Body Diode Forward Current	I_{SM}			63	A
Revers Recovery Time $I_F = 10A, di/dt = 100A/us$	T_{rr}		141	190	ns
Revers Recovery Charge $I_F = 10A, di/dt = 100A/us$	Q_{rr}		1.0		nC

Typical Performance Characteristics

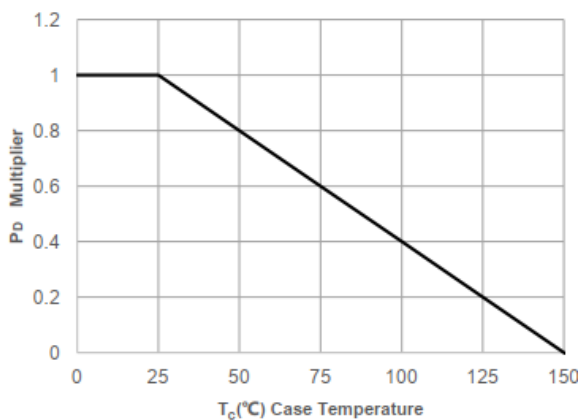


Figure 1. Power De-rating

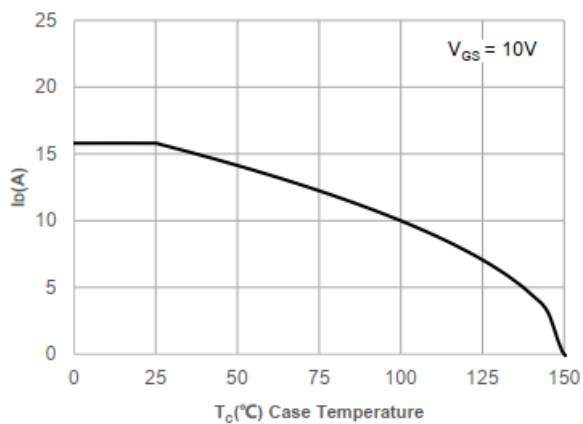


Figure 2. Current De-rating

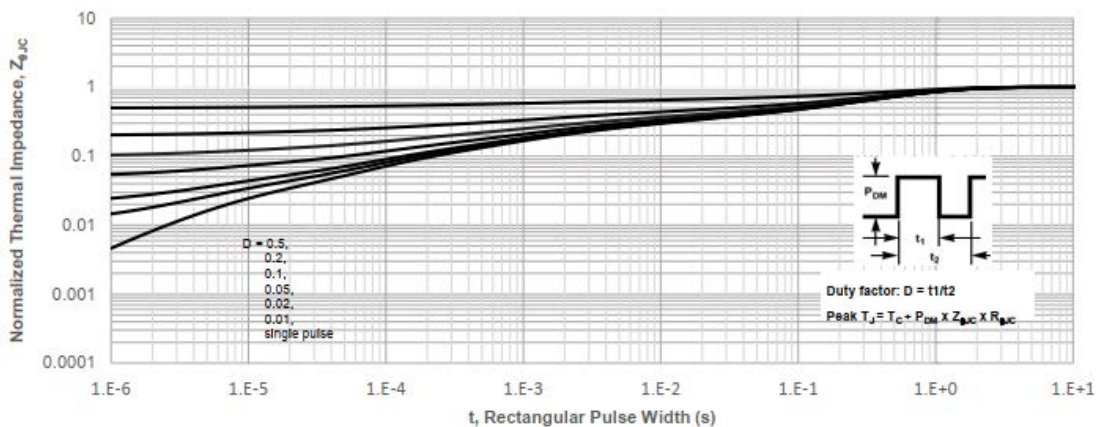


Figure 3. Normalized Maximum Transient Thermal Impedance

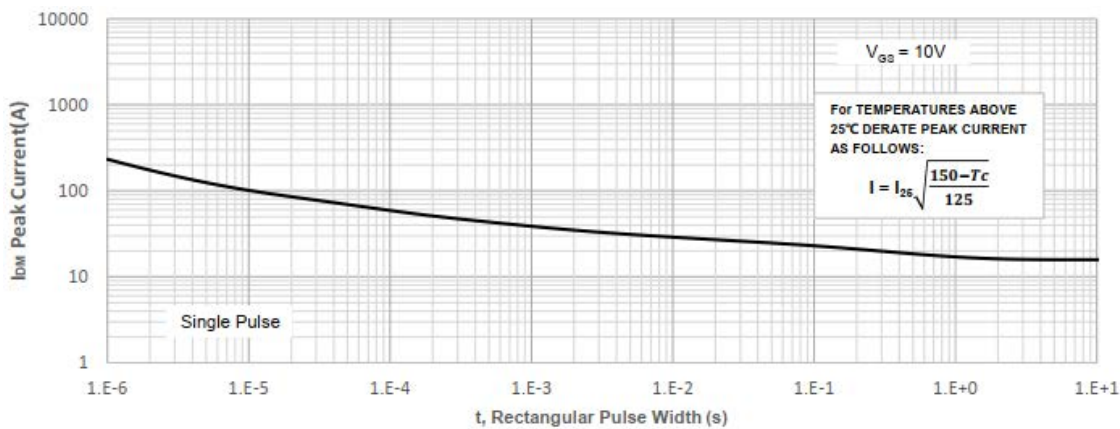


Figure 4. Peak Current Capacity

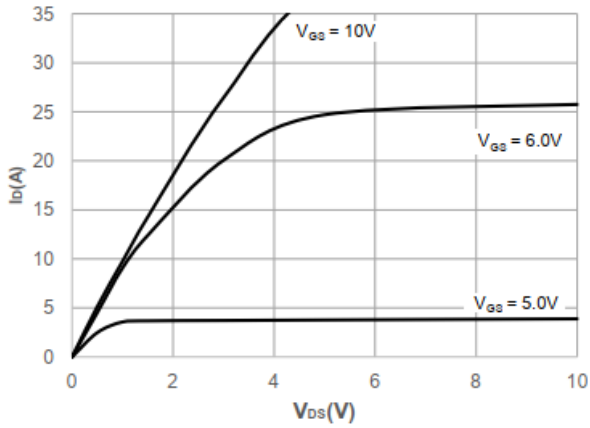


Figure 5. Output Characteristics

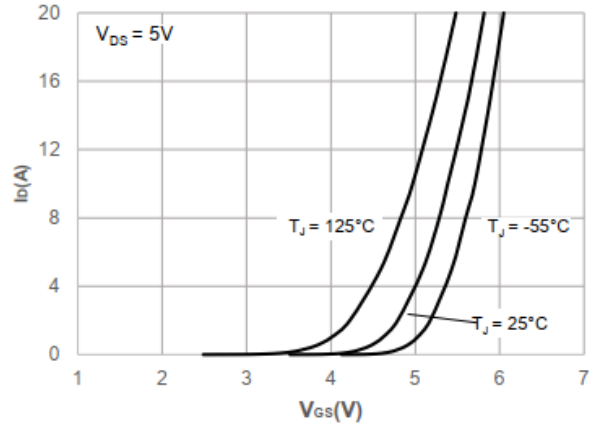


Figure 6. Typical Transfer Characteristics

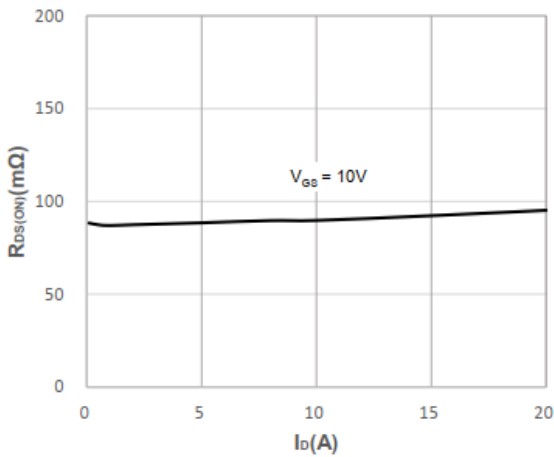


Figure 7. On-resistance vs. Drain Current

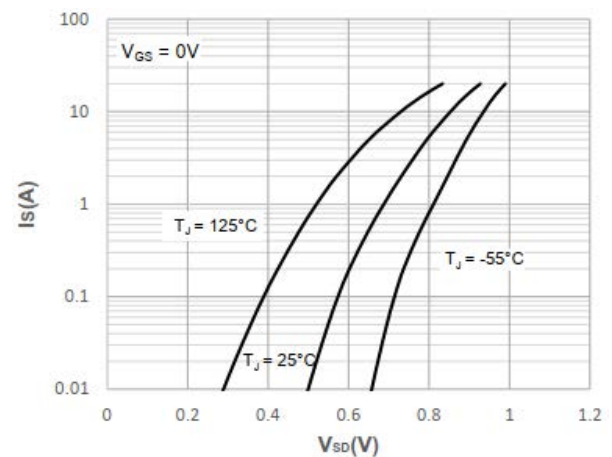


Figure 8. Body Diode Characteristics

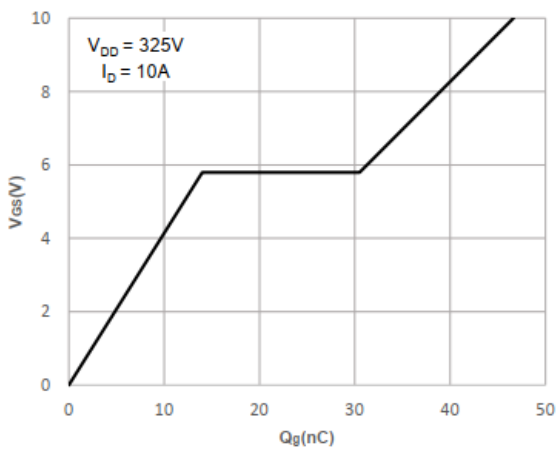


Figure 9. Gate Charge Characteristics

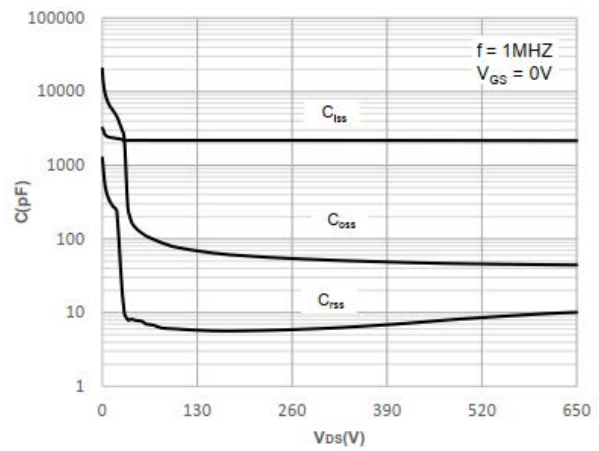


Figure 10. Capacitance Characteristics

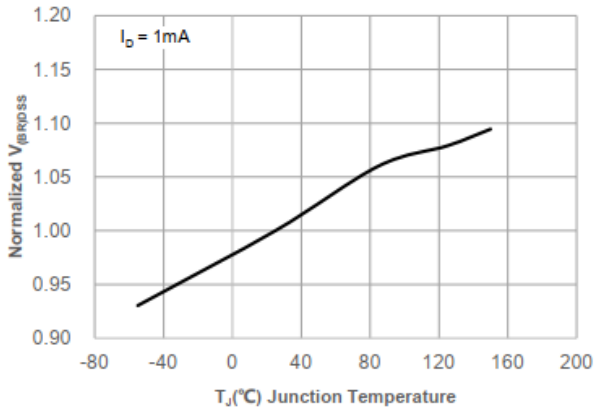


Figure 11. Normalized Breakdown voltage vs. Junction Temperature

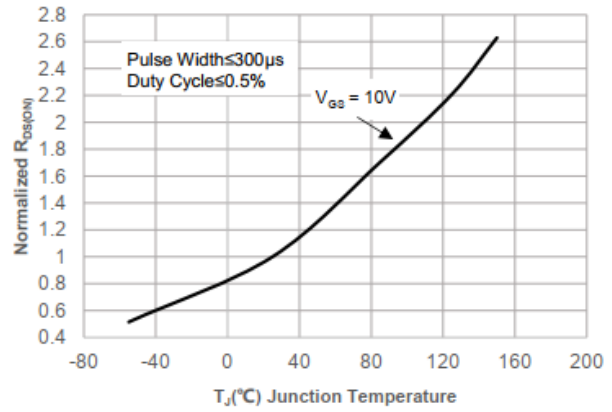


Figure 12. Normalized on Resistance vs. Junction Temperature

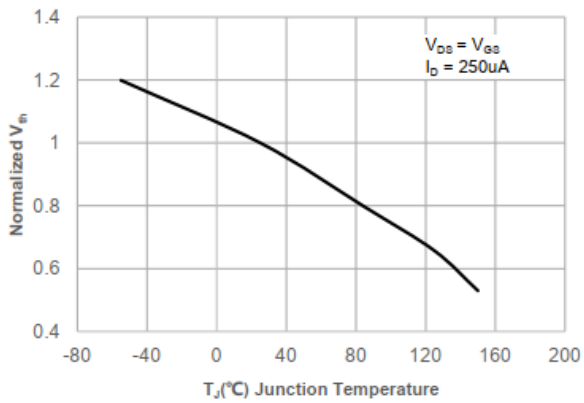


Figure 13. Normalized Threshold Voltage vs. Junction Temperature

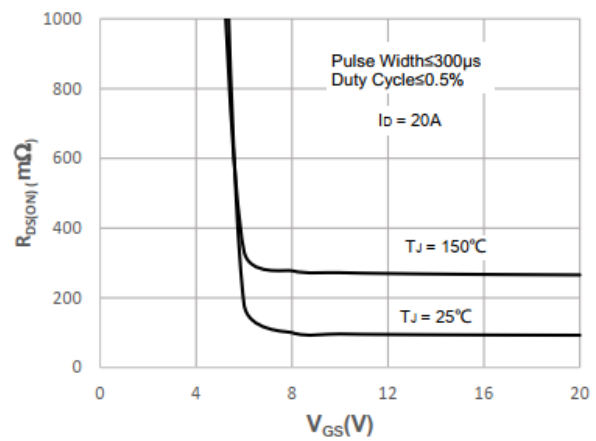


Figure 14. R_{DS(ON)} vs. V_{GS}

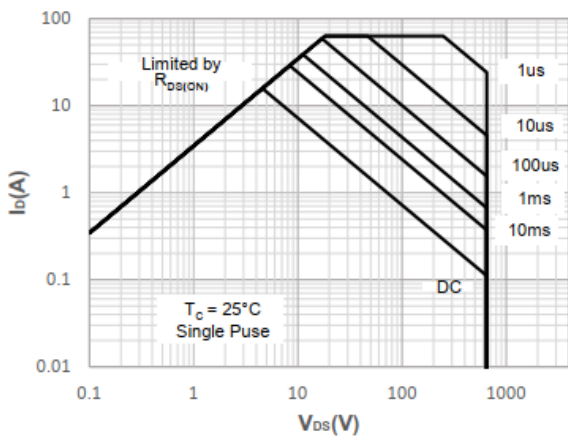
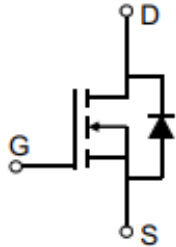
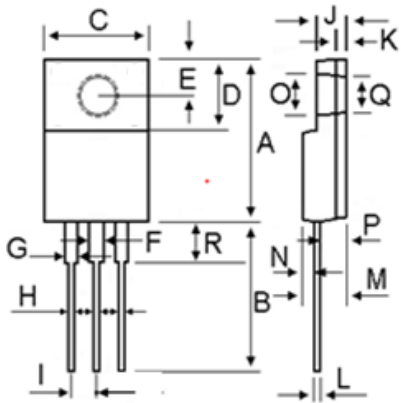


Figure 15. Maximum Safe Operating Area

- Circuit diagram



- Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	14.80	16.10
B	12.65	14.40
C	9.70	10.36
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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