



100V N-Channel Power MOSFET

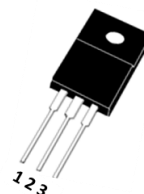
DESCRIPTION :

- Extremely low on-resistance $R_{DS(on)}$
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100% ΔV_{DS} test
- Pb-Free plating / Halogen-Free / RoHS compliant

TYPICAL APPLICATIONS :

- Motor Control and Drive
- Charge/Discharge for Battery Management System
- Synchronous Rectifier for SMPS

V_{DSS}	100V
I_D	41A
$R_{DS(ON_Typ. @V_{GS}=10V}$	17m Ω



ITO-220

MAXIMUM RATINGS (at $T_c = 25^\circ\text{C}$, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_c=25^\circ\text{C}$ $T_c=100^\circ\text{C}$	I_D	41 26	A
Pulsed Drain Current	tp limited by T_{jmax}	$I_{D \text{ pulse}}$	164	A
Single Pulsed Avalanche Energy ⁽¹⁾	$L=0.5\text{mH}$, $R_g=25\Omega$	EAS	100	mJ
Power dissipation	$T_c=25^\circ\text{C}$ $T_a=25^\circ\text{C}$	P_D	28 1.4	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	$^\circ\text{C}$

Notes : 1. EAS was tested at $T_J = 25^\circ\text{C}$, $L = 0.5\text{mH}$, $I_D=14\text{A}$..

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	90 4.5	$^\circ\text{C/W}$



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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage $V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	100			V
Zero Gate Voltage Drain Current $V_{DS} = 100V, V_{GS} = 0V, T_J = 25^\circ\text{C}$ $V_{DS} = 100V, V_{GS} = 0V, T_J = 125^\circ\text{C}$	I_{DSS}			1.0 100	μA
Gate-Source Leakage Current $V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}			± 100	nA
Gate-Source threshold voltage $V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(th)}$	2.0		4.0	V
Drain-Source On-State Resistance $V_{GS} = 10V, I_D = 20A$	$R_{DS(on)}$		17	20	m Ω
Forward Transconductance $V_{DS} = 5.0V, I_D = 20A$	g_{fs}		15		S
Input capacitance $f = 1MHz, V_{DS} = 50V, V_{GS} = 0V$	C_{iss}		790		pF
Output capacitance $f = 1MHz, V_{DS} = 50V, V_{GS} = 0V$	C_{oss}		184		pF
Reverse transfer capacitance $f = 1MHz, V_{DS} = 50V, V_{GS} = 0V$	C_{rss}		10		pF
Total Gate Charge $V_{DS} = 50V, I_D = 20A, V_{GS} = 10V$	Q_G		12		nC
Gate to Source Charge $V_{DS} = 50V, I_D = 20A, V_{GS} = 10V$	Q_{GS}		4		nC
Gate to Drain Charge $V_{DS} = 50V, I_D = 20A, V_{GS} = 10V$	Q_{GD}		2.4		nC
Gate Plateau Voltage $V_{DS} = 50V, I_D = 20A, V_{GS} = 10V$	$V_{plateau}$		5.3		V
Turn-on delay time $V_{DS} = 50V, V_{GS} = 10V, R_{GEN} = 3.0\Omega$	$t_{d(ON)}$		7		ns
Rise time $V_{DS} = 50V, V_{GS} = 10V, R_{GEN} = 3.0\Omega$	t_r		19		ns
Turn-off delay time $V_{DS} = 50V, V_{GS} = 10V, R_{GEN} = 3.0\Omega$	$t_{d(OFF)}$		10		ns
Fall time $V_{DS} = 50V, V_{GS} = 10V, R_{GEN} = 3.0\Omega$	t_f		4		ns
Peak Reverse Recovery Current $T_c = 25^\circ\text{C}$	I_S			41	A
Diode Forward Voltage $V_{GS} = 0V, I_{SD} = 20A$	V_{SD}			1.2	V
Revers Recovery Time $I_F = 20A, di_F/dt = 100A/\mu s, T_J = 25^\circ\text{C}$	T_{rr}		38		ns
Revers Recovery Charge $I_F = 20A, di_F/dt = 100A/\mu s, T_J = 25^\circ\text{C}$	Q_{rr}		47		μC

Typical Performance Characteristics

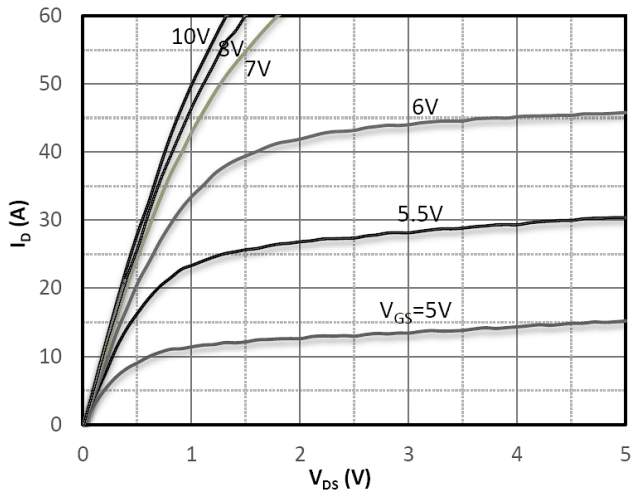


Figure 1. Output Characteristics

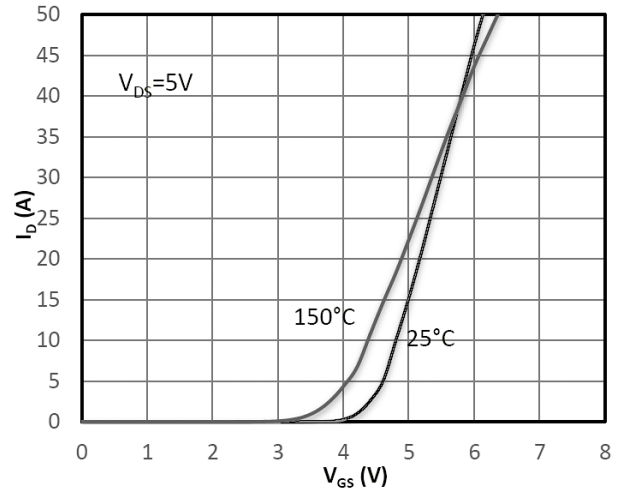


Figure 2. Transfer Characteristics

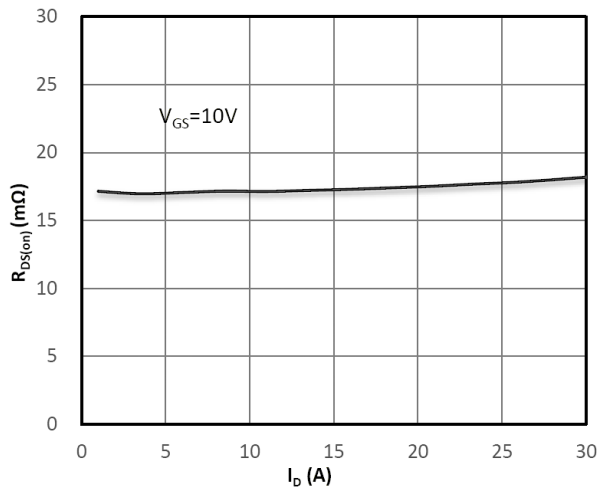


Figure 3. R_{DS(on)} vs Drain Current

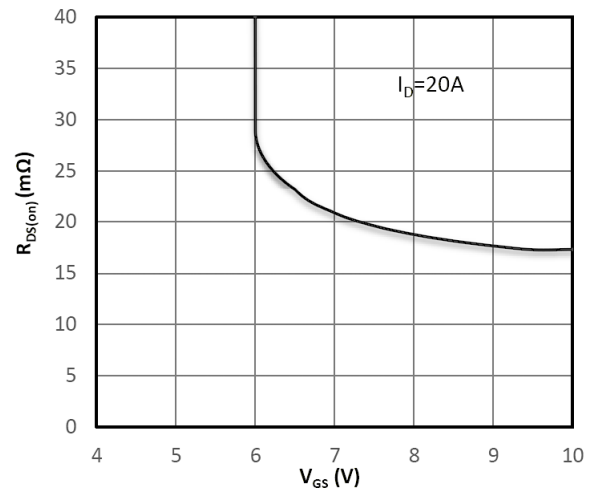


Figure 4. R_{DS(on)} vs Gate Voltage

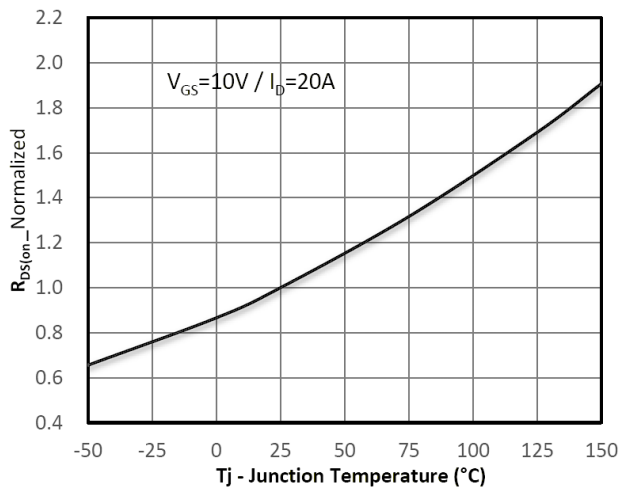


Figure 5. R_{DS(on)} vs. Temperature

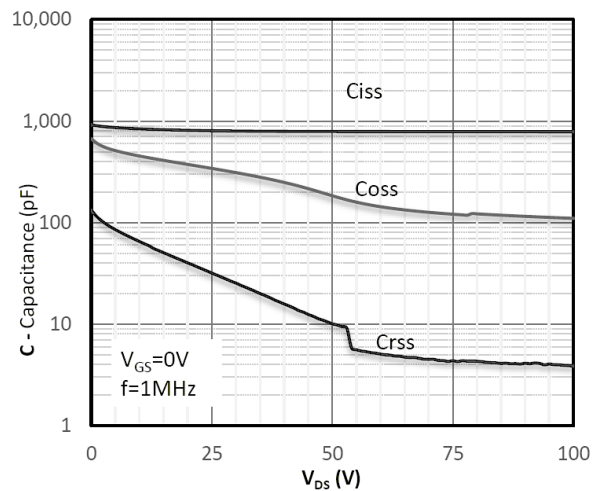


Figure 6. Capacitance Characteristics

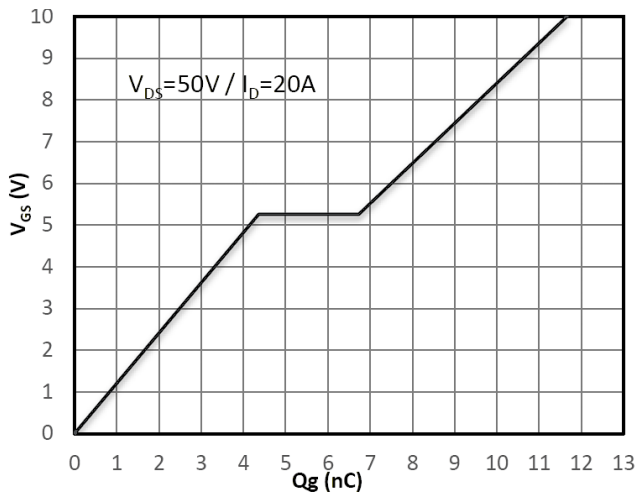


Figure 7. Gate Charge Characteristics

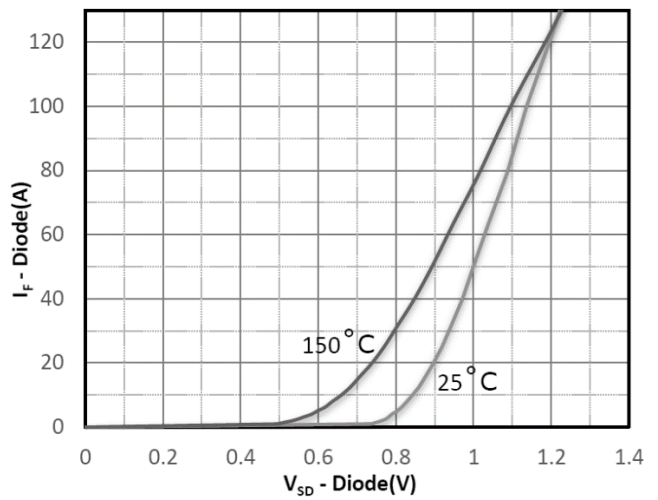


Figure 8. Body-diode Forward Characteristics

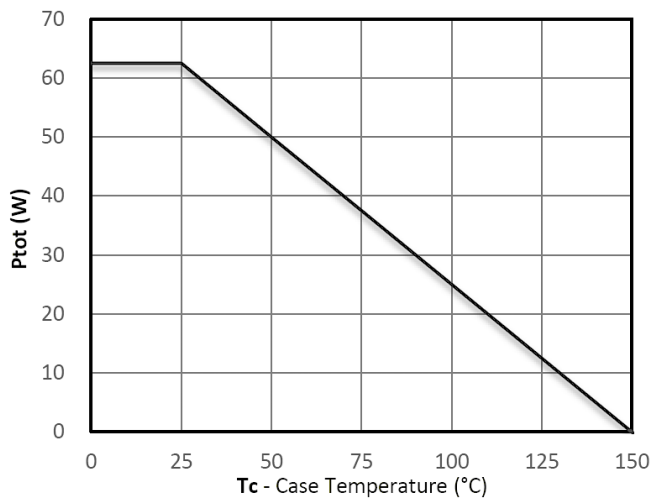


Figure 9. Power De-rating

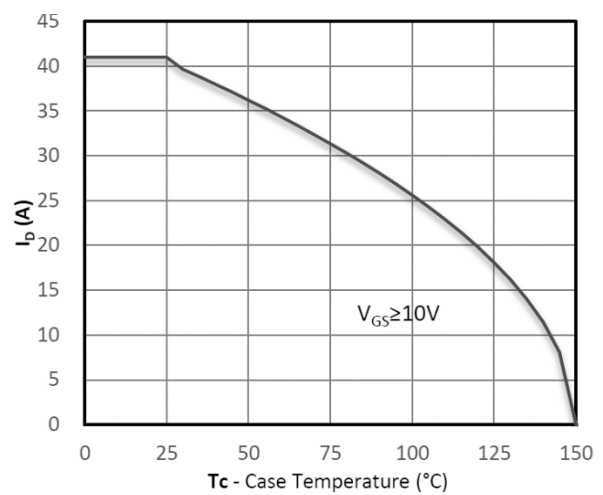


Figure 10. Current De-rating

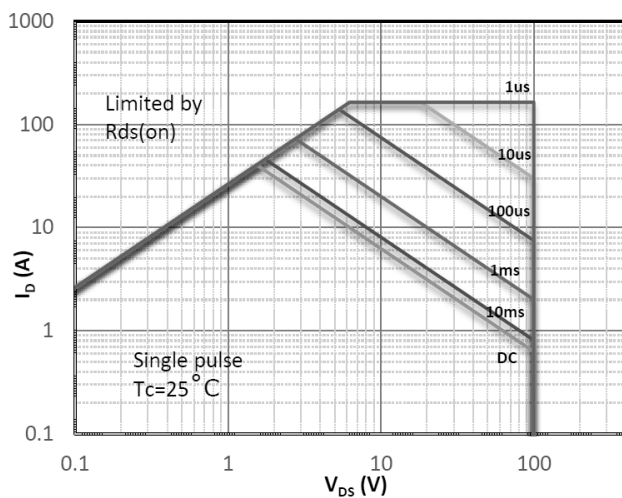


Figure 11. Safe Operating Area

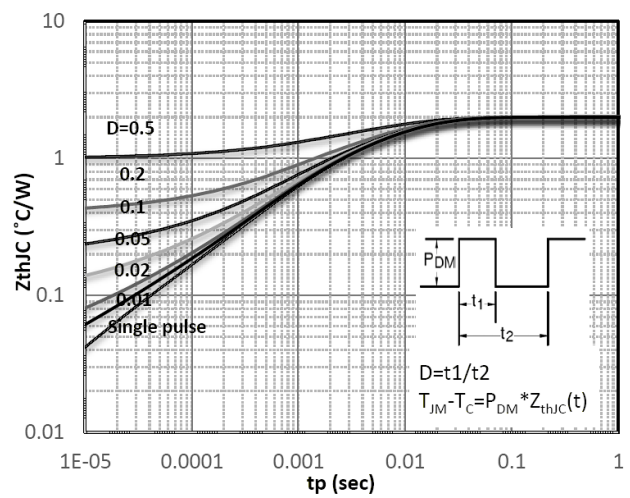
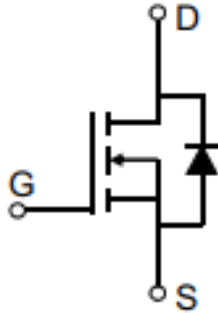
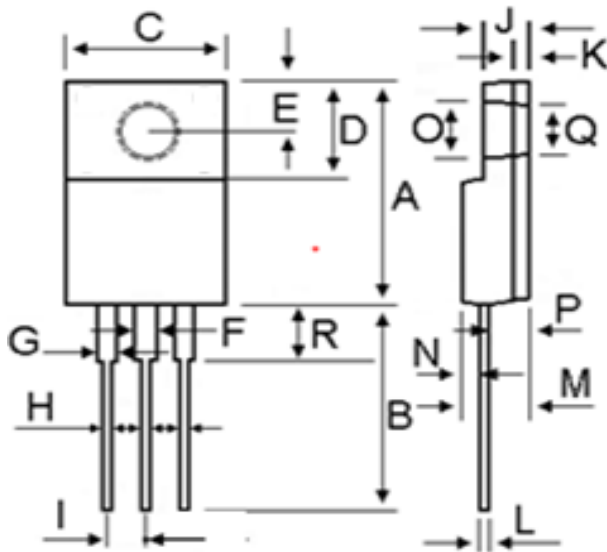


Figure 12. Max. Transient Thermal Impedance

·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