MOSPEC

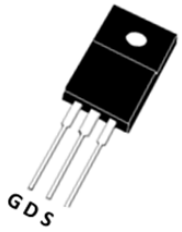
23P60F

60V P-Channel Power MOSFET

DESCRIPTION：
- Low Gate Charge
- 100% UIS Tested, 100% Rg Tested
- RoHS compliant
- Pb-Free Lead Plating

V_{DS}	-60V
I_D @V_{GS}=-10V	-23A
$R_{DS(ON)\_Typ.}$ @V_{GS}=-10V	40mΩ

TYPICAL APPLICATIONS：
- LED Back-lighting Application
- DC/DC Power Management
- High Side Switch for Full Bridge Converter



ITO-220AB

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

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	-23 -14.8	A
Pulsed Drain Current (1)		I_{DM}	-59	A
Avalanche Energy (2)		E_{AS}	75	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	75 77	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes： 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} of 75 mJ is based on starting T_J = 25°C, L = 3.0mH, I_{AS} = -7.1A, V_{GS} = -10V, V_{DD} = -30V; 100% test at L = 0.1mH, I_{AS} = -25A, T_{J_Max} = 150°C.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	60 3.4	℃/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	$V_{(BR)DSS}$	-60			V
Zero Gate Voltage Drain Current VDS = -48 V, VGS = 0 V	I_{DSS}			-1	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	-2.0	-3.0	V
Drain-Source On-State Resistance VGS = -10V, ID = -7A VGS = -4.5V, ID = -5A	$R_{DS(on)}$		40 55	50 72	mΩ
Forward Transconductance VDS = -5V, ID = -7A	$G_{FS)}$		20		S
Input capacitance f=1MHz, VDS= -30 V, VGS=0 V	C_{iss}		855		pF
Output capacitance f=1MHz, VDS= -30 V, VGS=0 V	C_{oss}		189		pF
Reverse transfer capacitance f=1MHz, VDS= -30 V, VGS=0 V	C_{rss}		9.5		pF
Gate Resistance VDS=0 V, VGS= 0V, f=1MHz	R_g		9.2		Ω
Total Gate Charge VDS= -30V, ID= -7A, VGS= -10V VDS= -30V, ID= -7A, VGS= -4.5V	Q_G		13.5 6.4		nC
Gate to Source Charge VDS= -30V, ID= -7A, VGS=0 to -10V	Q_{GS}		3.6		nC
Gate to Drain Charge VDS= -30V, ID= -7A, VGS=0 to -10V	Q_{GD}		1.8		nC
Turn-on delay time VDS= -30 V, VGS= -10V, R_L=4.3Ω, R_{GEN}=3Ω	td $_{(ON)}$		5.4		ns
Rise time VDS= -30 V, VGS= -10V, R_L=4.3Ω, R_{GEN}=3Ω	tr		1.9		ns
Turn-off delay time VDS= -30 V, VGS= -10V, R_L=4.3Ω, R_{GEN}=3Ω	td $_{(OFF)}$		23		ns
Fall time VDS= -30 V, VGS= -10V, R_L=4.3Ω, R_{GEN}=3Ω	tf		4.2		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 = -1A	V_{SD}		-0.78	-1.0	V
Diode Continuous Current, Tc=25℃	I_S			-23	A
Revers Recovery Time IF= -7A, dI_F/dt = -100A/us	Trr		27		ns
Revers Recovery Charge IF= -7A, dI_F/dt = -100A/us	Qrr		28		nC

Typical Performance Characteristics

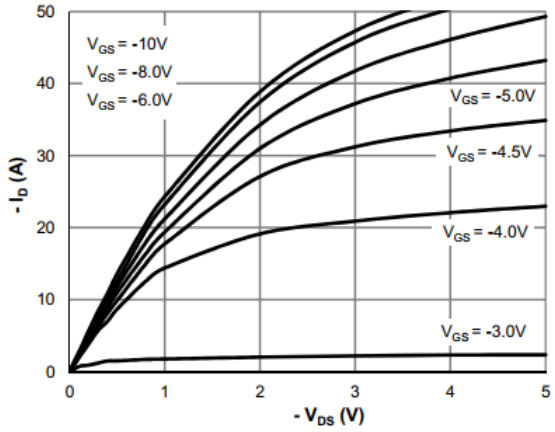


Figure 1. Saturation Characteristics

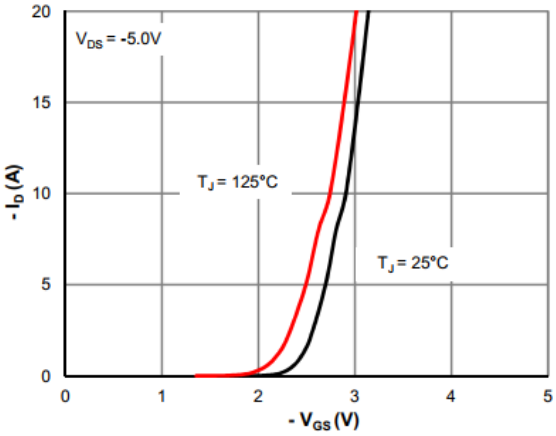


Figure 2. Transfer Characteristics

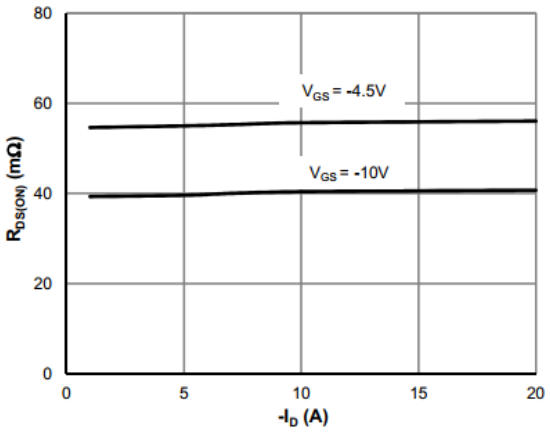


Figure 3. On-resistance vs. Drain Current

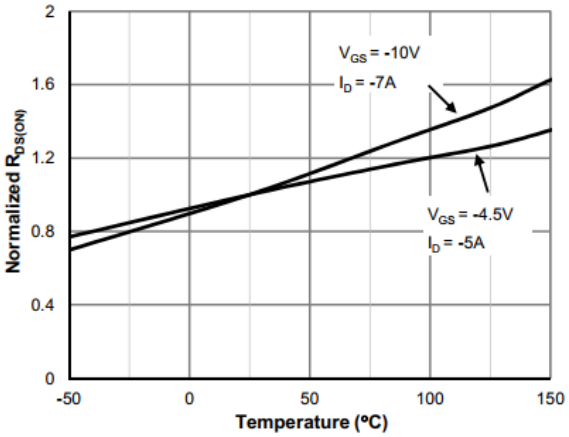


Figure 4. $R_{DS(ON)}$ vs. Junction Temperature

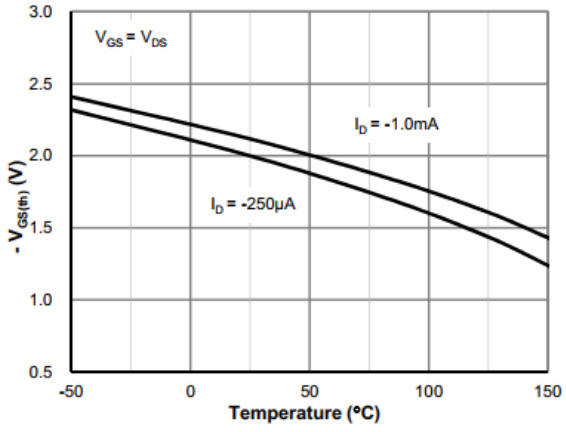


Figure 5. VGS(th) vs. Junction Temperature

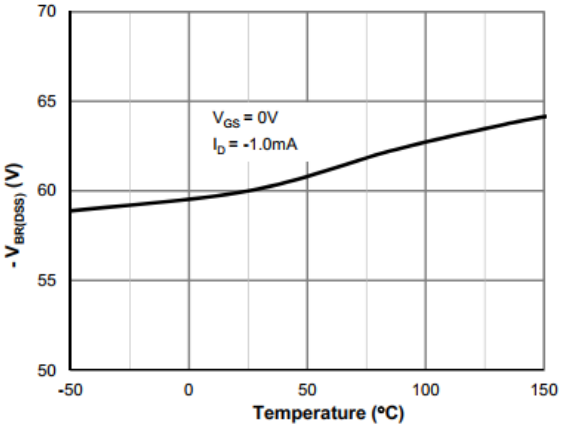


Figure 6. $V_{BR(DSS)}$ vs. Junction Temperature

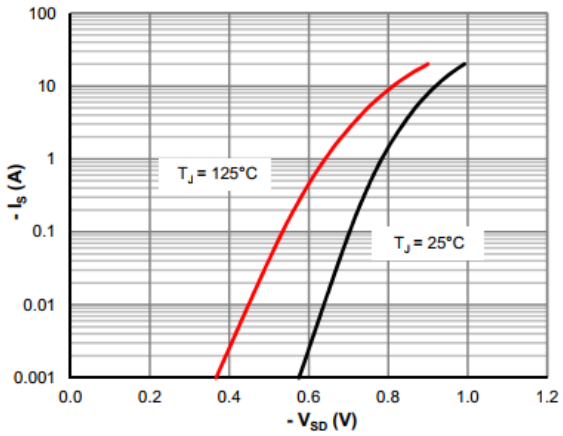


Figure 7. Body-Diode Characteristics

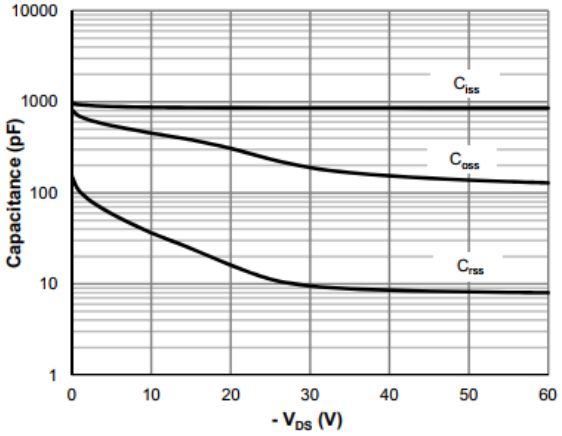


Figure 8. Capacitance Characteristics

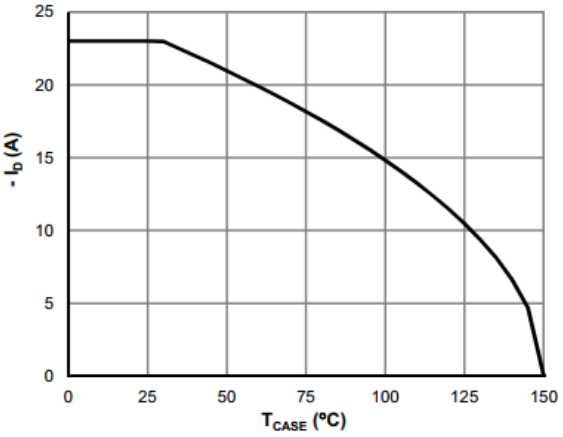


Figure 9. Current De-rating

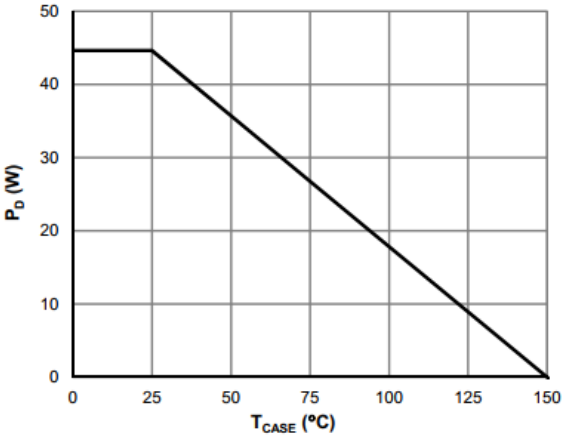


Figure 10. Power De-rating

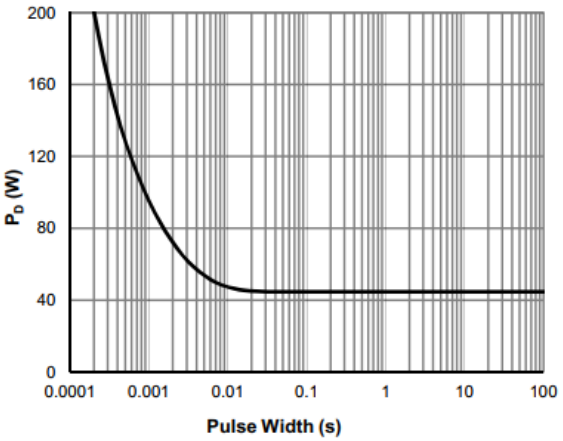


Figure 11. Single Pulse Power Rating, Junction-to-Case

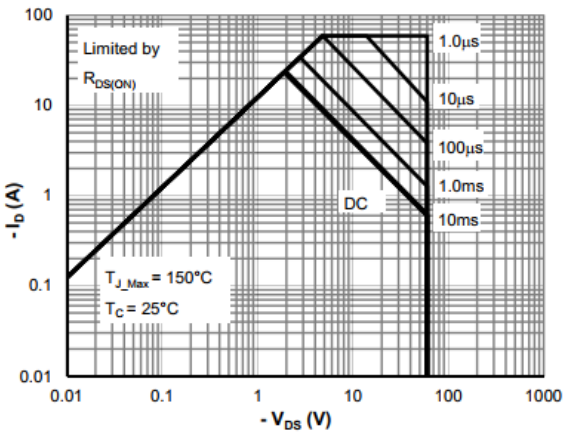


Figure 12. Maximum Safe Operating Area

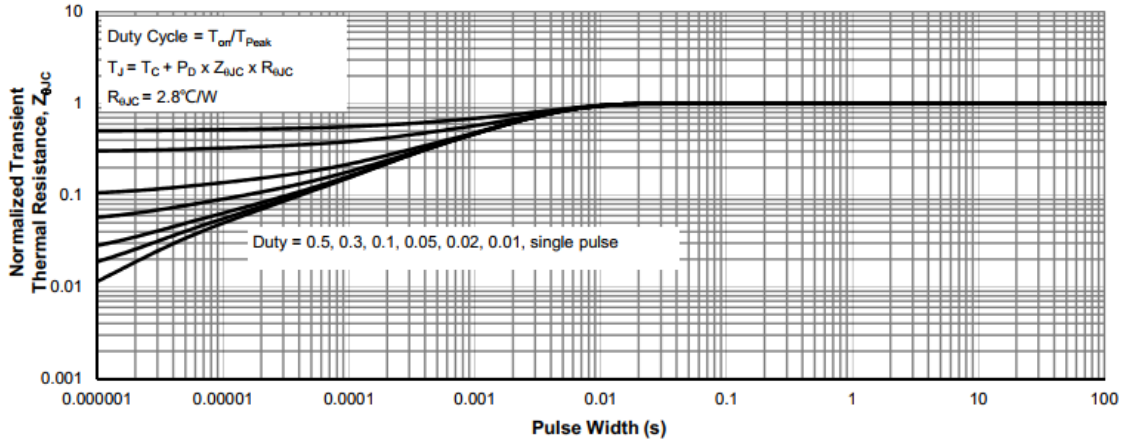
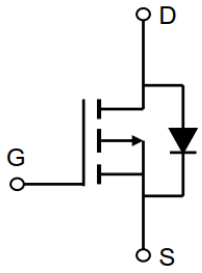
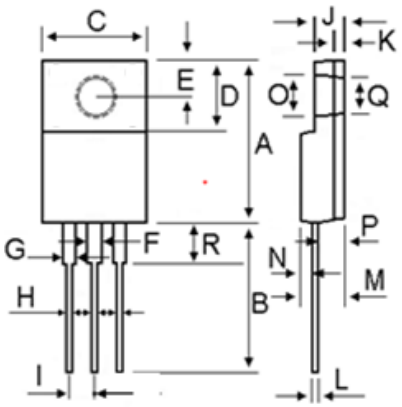


Figure 13. Normalized Maximum Transient Thermal Impedance

・Circuit diagram



・Package outlines : Dimensions in (mm)



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