40V N-channel Power SGT MOSFET

DESCRIPTION：

·Excellent $R_{DS(ON)}$ and Low Gate Charge

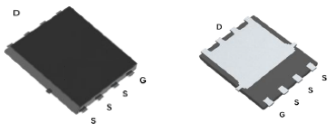
·100% UIS Tested

·100%ΔVds Tested

·Halogen-free

·RoHS-compliant

V_{DSS}	40V
I_D @V_{GS}=10V	163A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	1.9mΩ



PDFN5×6-8L

TYPICAL APPLICATIONS：

·Power Mahagement

·Load Switch

·PWM Application

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

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	163 103	A
Pulsed Drain Current (1)		I_{DM}	Refer to Fig.4	A
Single Pulsed Avalanche Energy (2)		E_{AS}	212	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	108 43	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} condition: Starting T_J=25C, V_{DD}=20V, V_{GS}=10V, R_G=25ohm, L=3mH, I_{AS}=15.4A, V_{DD}=0V during time in avalanche.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	43 1.2	℃/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	$V_{(BR)DSS}$	40			V
Zero Gate Voltage Drain Current VDS = 32V, 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	$V_{GS(th)}$	1.2	1.7	2.4	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A VGS = 4.5V, ID = 20A	$R_{DS(on)}$	1.3 2.0	1.9 2.9	2.5 3.7	mΩ
Gate Resistance f=1MHz	R_g		1.0		Ω
Input capacitance f=1MHz, VDS=20V, VGS=0 V	C_{iss}		2510	3389	pF
Output capacitance f=1MHz, VDS=20V, VGS=0 V	C_{oss}		1233	1665	pF
Reverse transfer capacitance f=1MHz, VDS=20V, VGS=0 V	C_{rss}		108	146	pF
Total Gate Charge VDS= 20V, ID= 20A,VGS= 0 to 10V	Q_G		42	56	nC
Gate to Source Charge VDS= 20V, ID= 20A,VGS= 0 to 10V	Q_{GS}		8.1		nC
Gate to Drain Charge VDS= 20V, ID= 20A,VGS= 0 to 10V	Q_{GD}		8.8		nC
Turn-on delay time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	$td_{(ON)}$		11		ns
Rise time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	tr		26		ns
Turn-off delay time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	$td_{(OFF)}$		32		ns
Fall time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	tf		8.8		ns
Maximum Continuous Body Diode Forward Current	IS			163	A
Maximum Pulsed Body Diode Forward Current	ISM			653	A
Diode Forward Voltage VGS = 0V, I_S =20A	V_{SD}			1.2	V
Revers Recovery Time IF=20A, di/dt = 100A/us	Trr	30	41	56	ns
Revers Recovery Charge IF=20A, di/dt = 100A/us	Qrr		42		nC

Typical Performance Characteristics

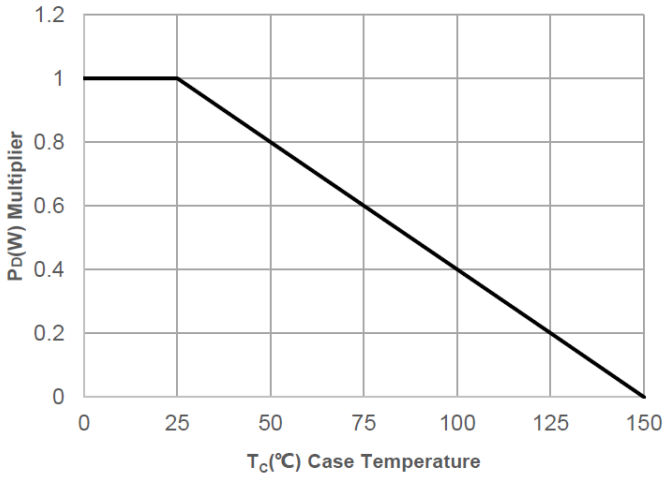


Figure 1. Power De-rating

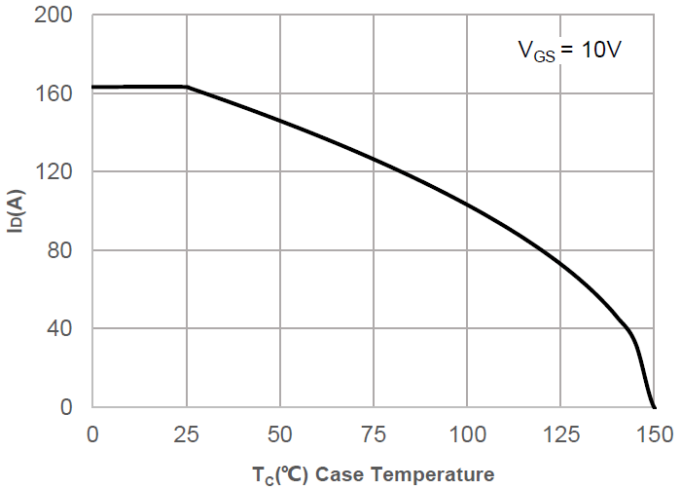


Figure 2. Current De-rating

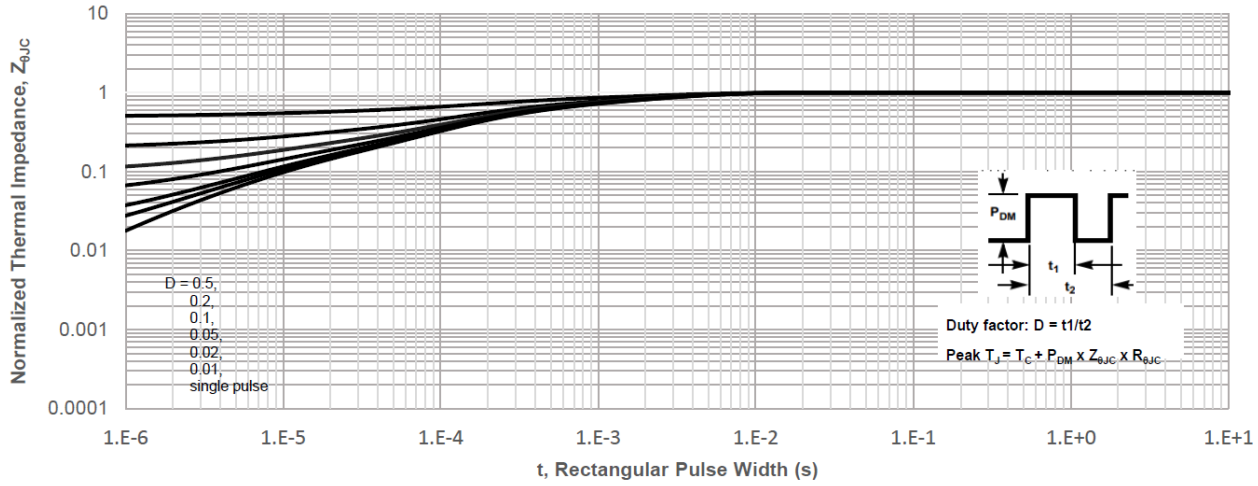


Figure 3. Normalized Maximum Transient Thermal Impedance

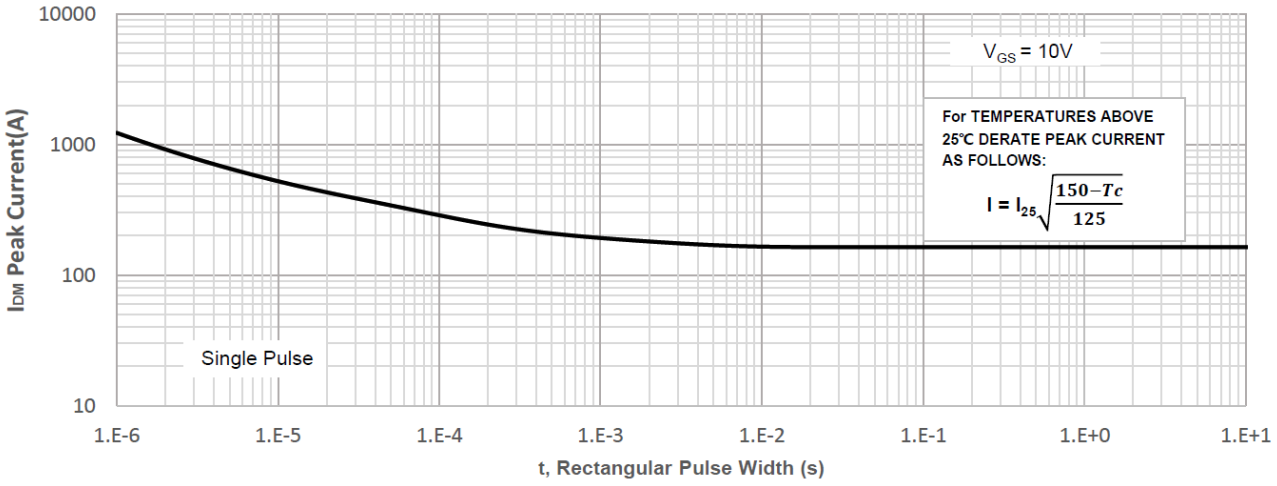


Figure4. Peak Current Capacity

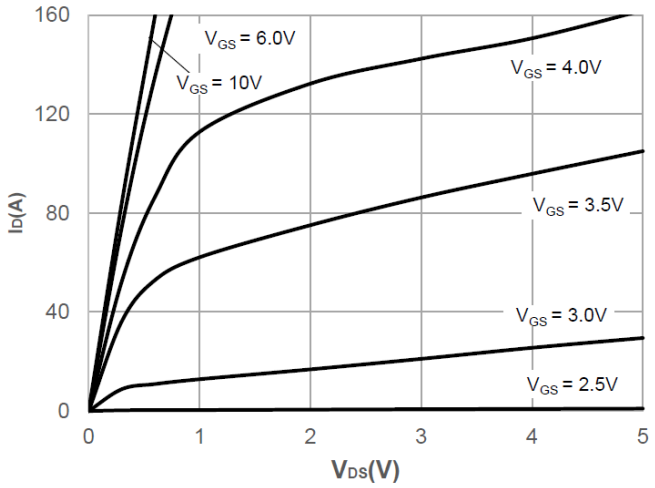


Figure 5. Output Characteristics

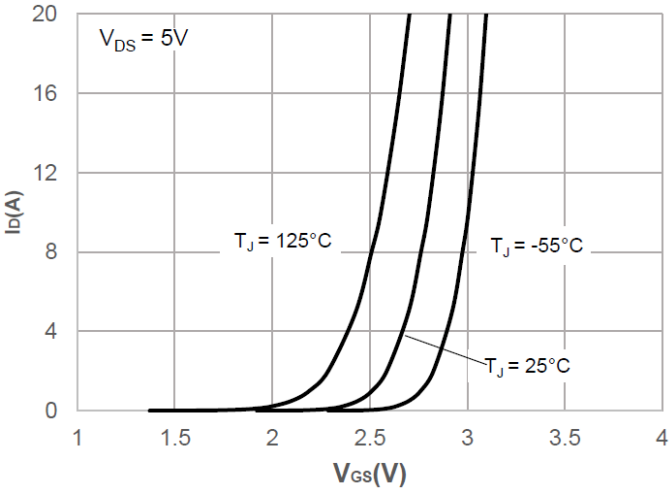


Figure 6. Typical Transfer Characteristics

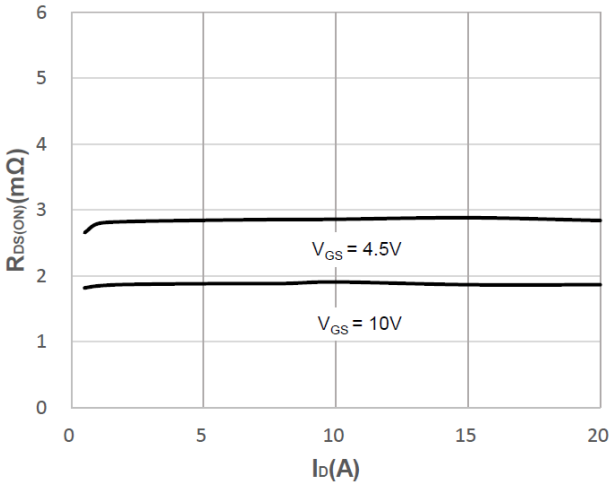


Figure 7. On-resistance vs. Drain Current

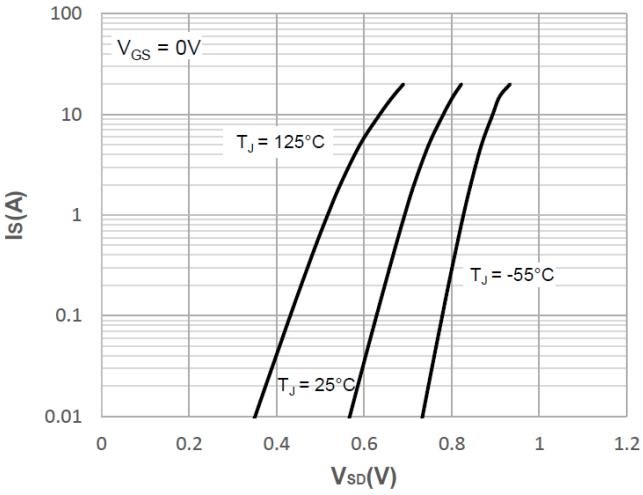


Figure8. Body Diode Characteristics

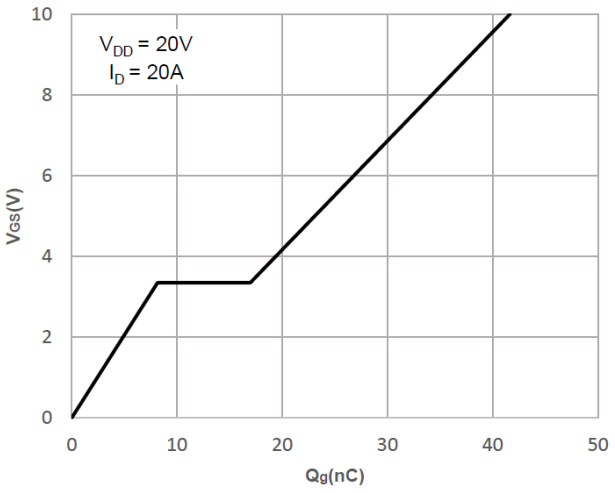


Figure 9. Gate Charge Characteristics

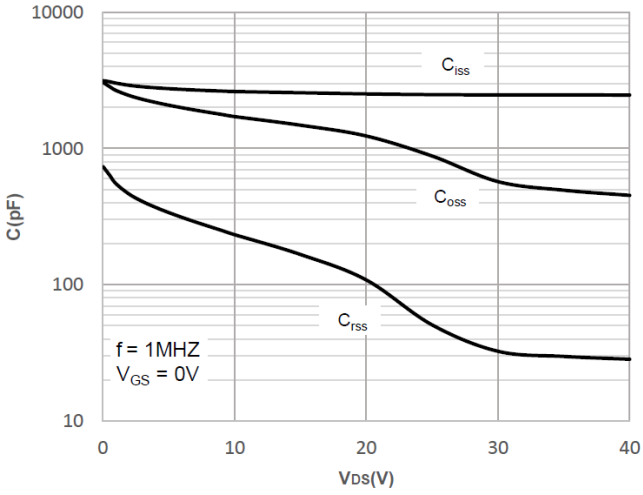


Figure 10. Capacitance Characteristics

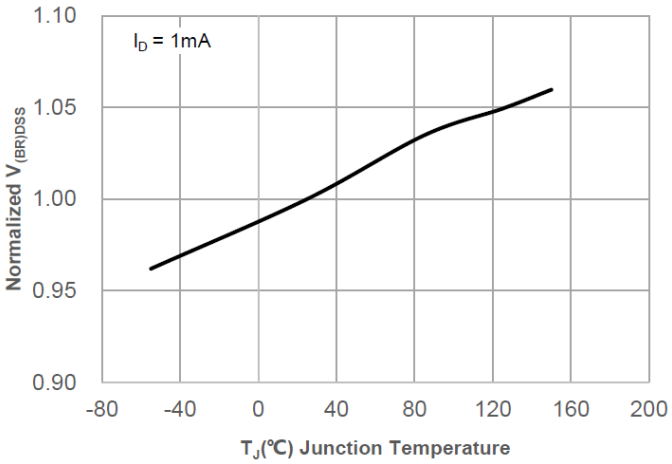


Figure 11. Normalized Breakdown voltage vs. Junction Temperature

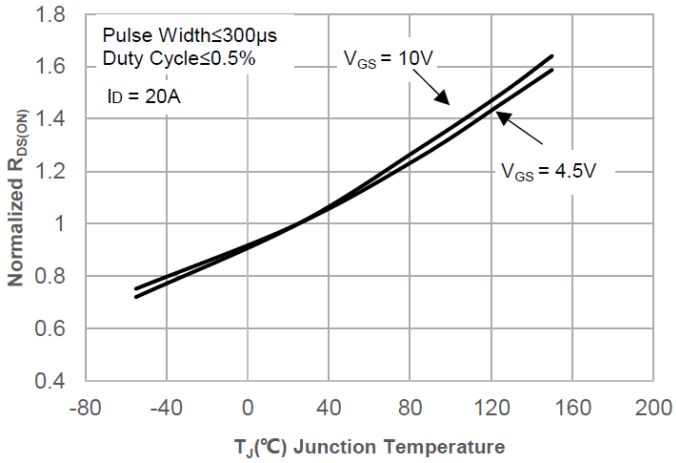


Figure 12. Normalized on Resistance vs. Junction Temperature

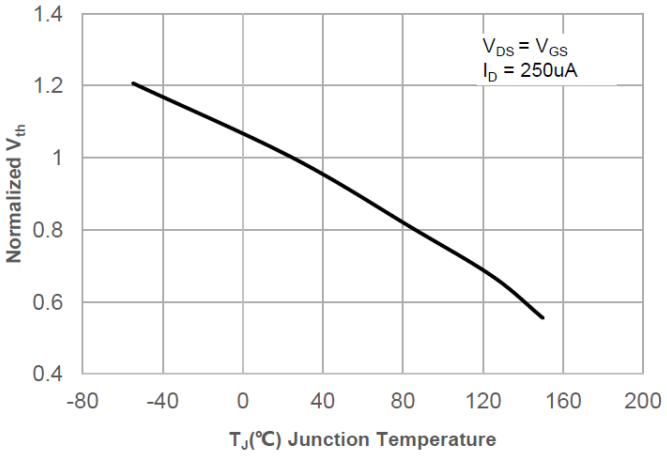


Figure 13. Normalized Threshold Voltage vs. Junction Temperature

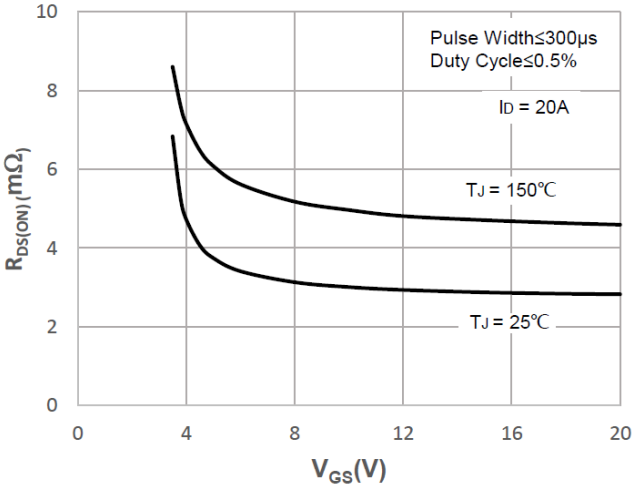


Figure14. $R_{DS(ON)}$ vs. V_{GS}

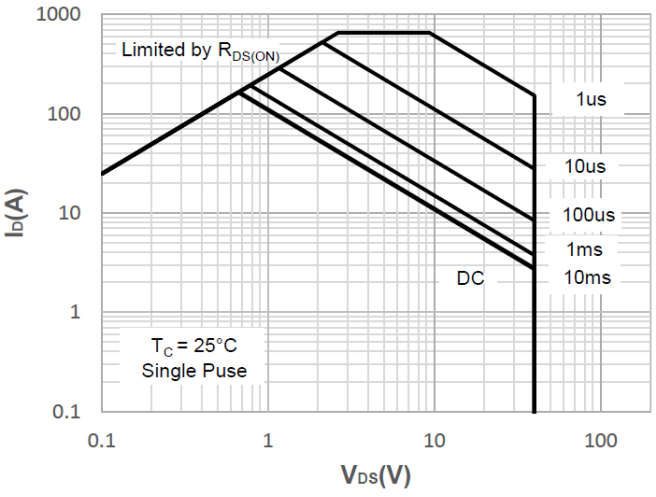
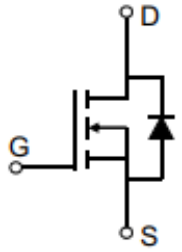
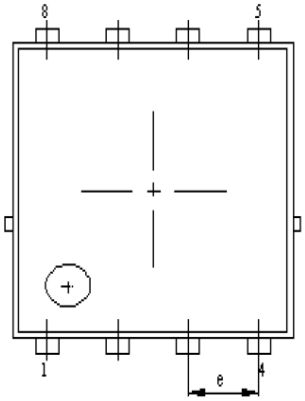


Figure 15. Maximum Safe Operating Area

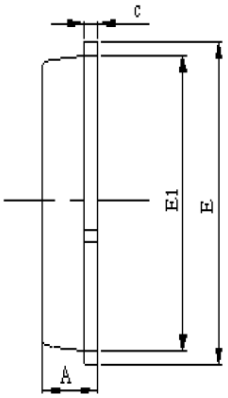
·Circuit diagram



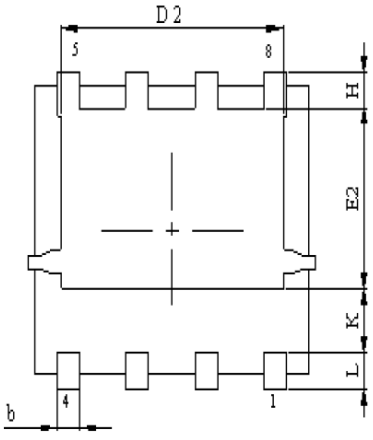
·Package outlines : Dimensions in (mm)



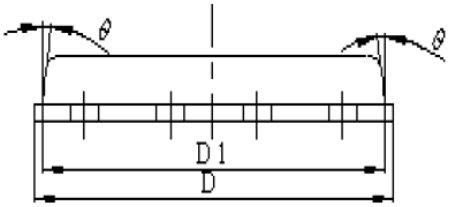
Top View



Side View



Bottom View



Front View

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.9	1	1.15
b	0.31	0.41	0.51
C	0.24	0.32	0.4
D	5	5.2	5.4
D1	4.95	5.05	5.15
D2	4	4.1	4.2
E	6.05	6.15	6.25
E1	5.5	5.6	5.7
E2	3.42	3.53	3.63
e	1.27BSC		
H	0.6	0.7	0.8
L	0.5	0.7	0.8
K	1.23 REF		
θ			10

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.)