

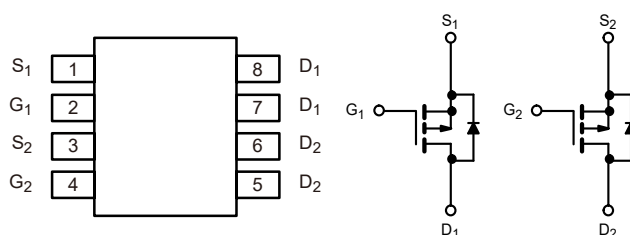
1.Features

- $V_{DS(V)} = -60V$
- $R_{DS(ON)} < 59m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} < 69m\Omega (V_{GS} = -4.5V)$

3.Pinning information

Pin	Symbol	Description
2,4	G	GATE
1,3	S	SOURCE
5,6,7,8	D	DRAIN

SOP-8



4.Absolute Maximum Ratings $T_A = 25^\circ C$

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ C$)	$T_C = 25^\circ C$	I_D	-5.3^e	A
	$T_C = 70^\circ C$		-5^e	
	$T_A = 25^\circ C$		$-5.3^{a,b}$	
	$T_A = 70^\circ C$		$-5^{a,b}$	
Pulsed Drain Current		I_{DM}	-32^e	
Continuous Source-Drain Diode Current	$T_C = 25^\circ C$	I_S	-4.1	
	$T_A = 25^\circ C$		$-2^{a,b}$	
Avalanche current	$L = 0.1\text{ mH}$	I_{AS}	-20	mJ
Single-pulse avalanche energy		E_{AS}	20	
Maximum Power Dissipation	$T_C = 25^\circ C$	P_D	4	W
	$T_C = 70^\circ C$		2.5	W
	$T_A = 25^\circ C$		$2^{a,b}$	W
	$T_A = 70^\circ C$		$1.4^{a,b}$	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$



5. Thermal resistance rating

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^{a,c}	$t \leq 10s$	R_{thJA}	38	50	°C/W
Maximum Junction-to-Foot	Steady-State	R_{thJF}	20	25	°C/W

Notes:

- a. Surface mounted on 1" x 1" FR4 board.
- b. $t = 10s$.
- c. Maximum under Steady State conditions is 85 °C/W.
- d. Based on $T_C = 25$ °C.
- e. Limited by package.



6. $T_J=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS}=0\text{V}$, $I_D=-250\mu\text{A}$	-60			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D=-250\mu\text{A}$		-3.1		mV/ $^{\circ}\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			4.5		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-1		-3	V
Gate-Source Leakage	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30\text{V}$, $V_{GS}=0\text{V}$			-1	μA
		$V_{DS}=-30\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^{\circ}\text{C}$			-5	
On-State Drain Current ^a	$I_{D(ON)}$	$V_{DS}\geq -10\text{V}$, $V_{GS}=-10\text{V}$	-30			A
Drain-Source On-State Resistance ^a	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$, $I_D=-6.3\text{A}$		54		m Ω
		$V_{GS}=-4.5\text{V}$, $I_D=-6.2\text{A}$		60		
Forward Transconductance ^a	g_{FS}	$V_{DS}=-10\text{V}$, $I_D=-6.1\text{A}$		23		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS}=-15\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$		1345		pF
Output Capacitance	C_{oss}			210		
Reverse Transfer Capacitance	C_{rss}			180		
Total Gate Charge	Q_g	$V_{DS}=-15\text{V}$, $V_{GS}=-10\text{V}$, $I_D=-6.1\text{A}$		32	50	nC
		$V_{DS}=-15\text{V}$, $V_{GS}=-4.5\text{V}$		15	25	
Gate Source Charge	Q_{gs}	$I_D=-6.1\text{A}$		4		
Gate Drain Charge	Q_{gd}			7.5		
Gate Resistance	R_g	$f=1\text{MHz}$		5.8		Ω
Turn-On DelayTime	$t_{D(on)}$	$V_{DD}=-15\text{V}$, $R_L=15\Omega$ $I_D=-1\text{A}$, $V_{GEN}=-10\text{V}$ $R_g=1\Omega$		10	15	ns
Rise Time	t_r			8	15	
Turn-Off DelayTime	$t_{D(off)}$			45	70	
Fall Time	t_f			12	25	



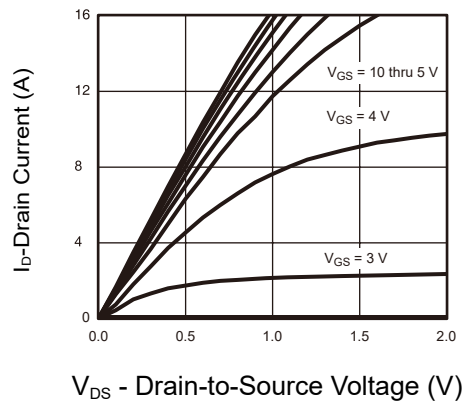
Turn-On DelayTime	t _{D(on)}	V _{DD} =-15V, R _L =15Ω I _D =-1A, V _{GEN} =-4.5V R _g =1Ω		42	70	ns
Rise Time	t _r			35	60	ns
Turn-Off DelayTime	t _{D(off)}			40	70	ns
Fall Time	t _f			16	30	ns
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C =25°C			-4.1	A
Pulse Diode Forward Current ^a	I _{SM}				-32	A
Body Diode Voltage	V _{SD}	I _S =-2A, V _{GS} =0V		-0.75	-1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F =-2A, dl/dt=100A/μs T _J =25°C		34	60	ns
Body Diode Reverse Recovery Charge	Q _{rr}			22	40	nC
Reverse Recovery Fall Time	t _a			11		ns
Reverse Recovery Rise Time	t _b			23		ns

Notes:

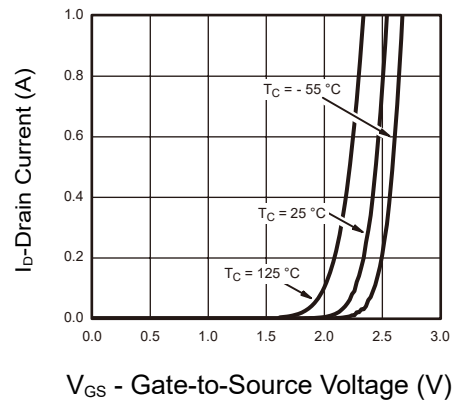
- a. Pulse test; pulse width $\leq 300 \mu s$, duty cycle $\leq 2 \%$.
- b. Guaranteed by design, not subject to production testing.



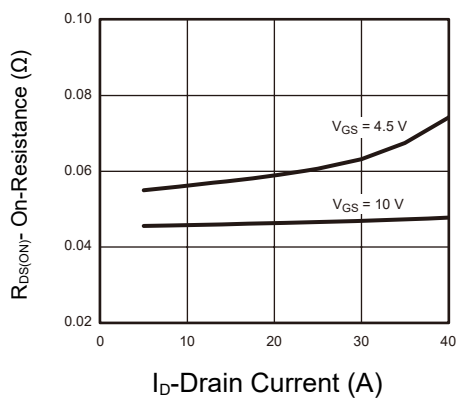
7.1 Typical Characteristics



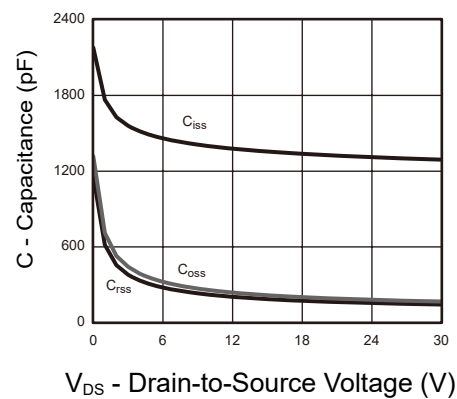
Output Characteristics



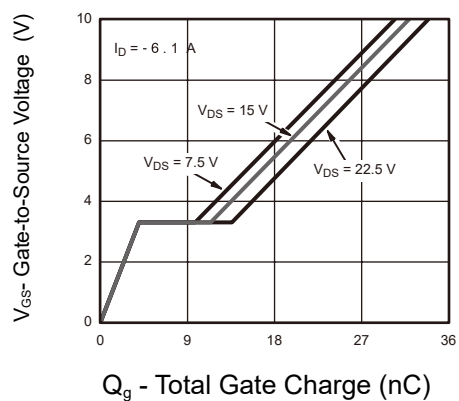
Transfer Characteristics



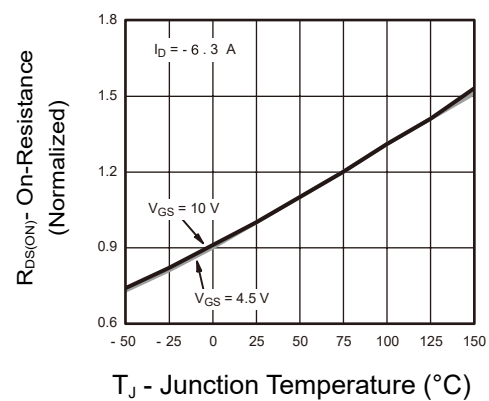
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



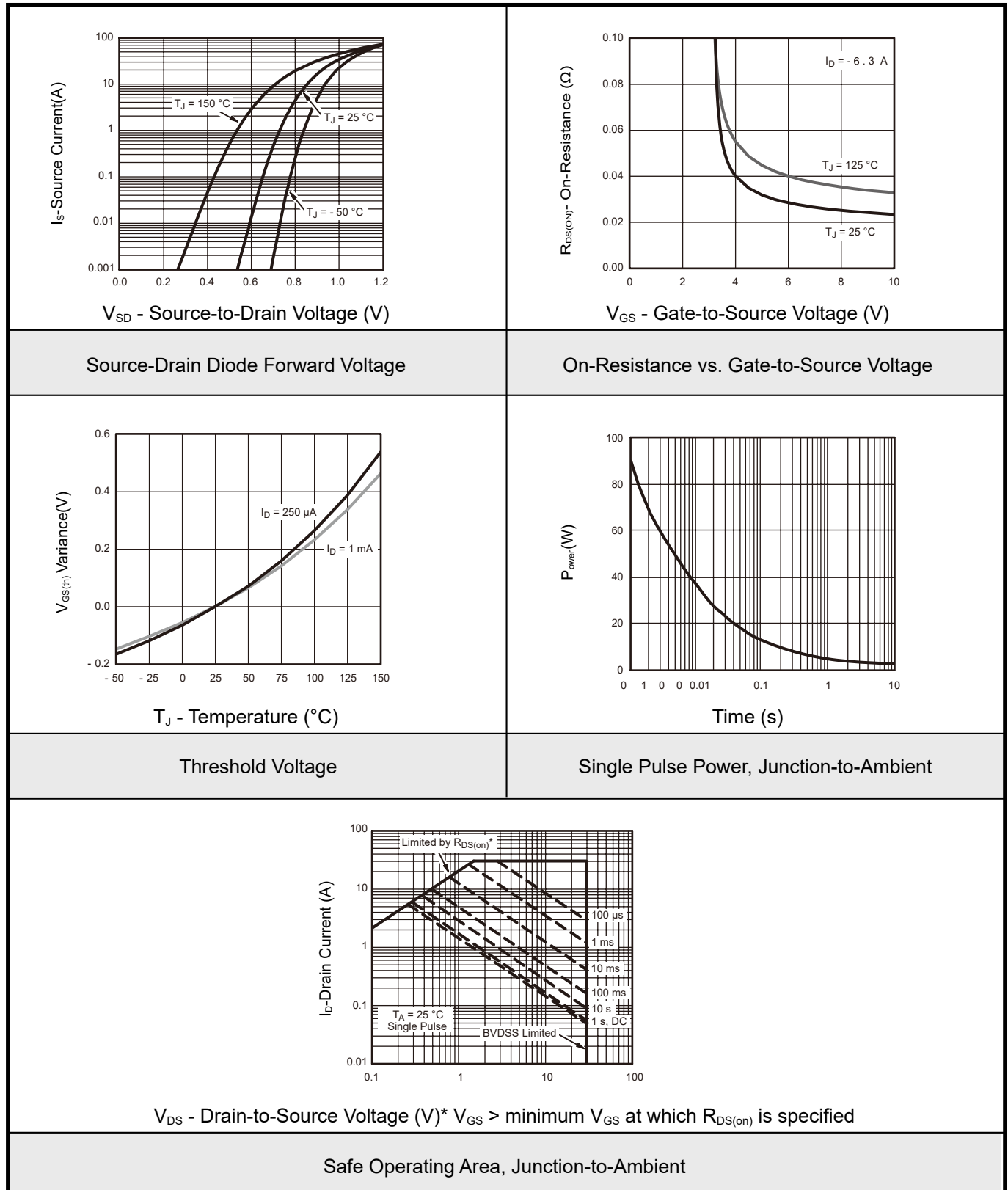
Gate Charge



On-Resistance vs. Junction Temperature

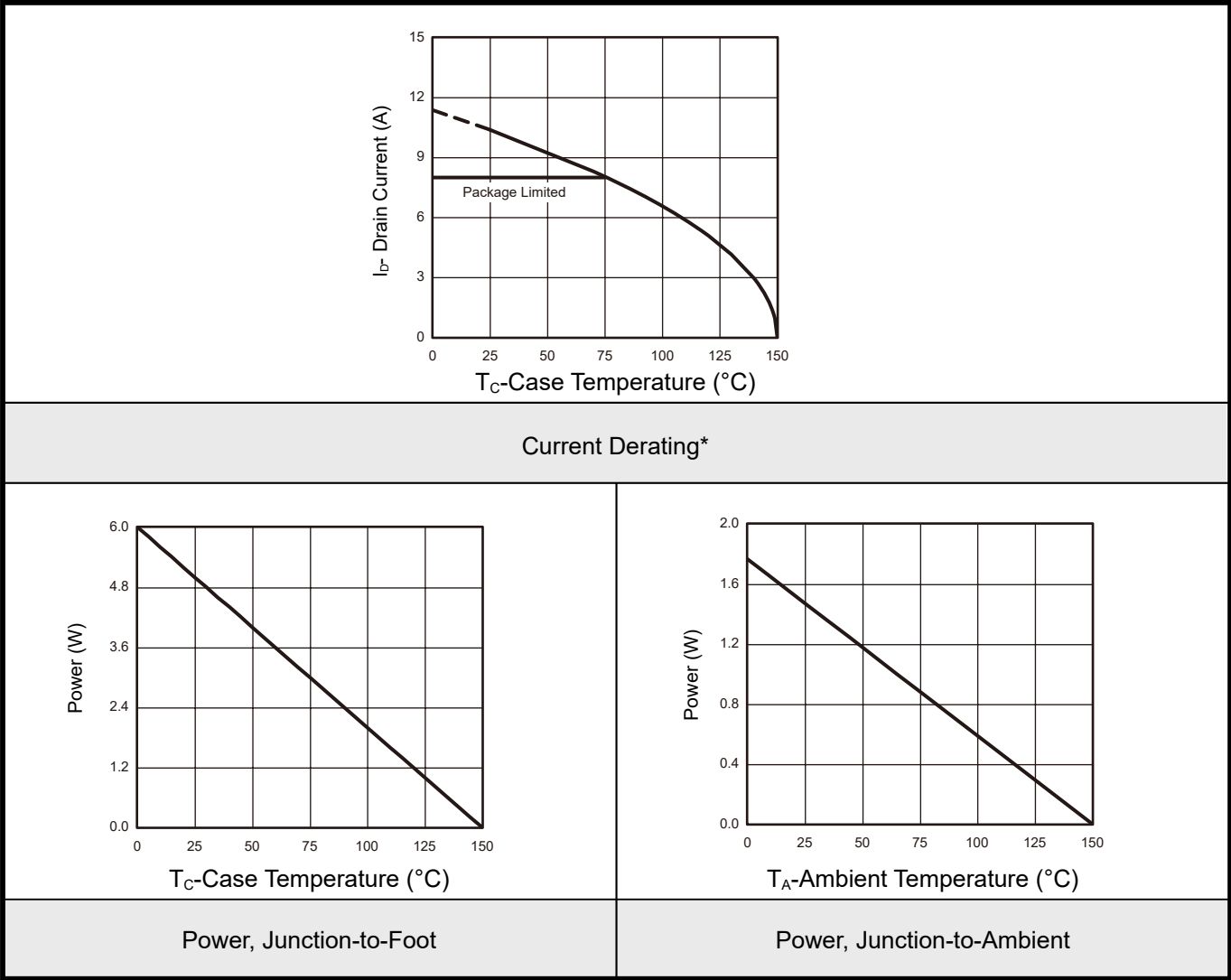


7.2 Typical Characteristics





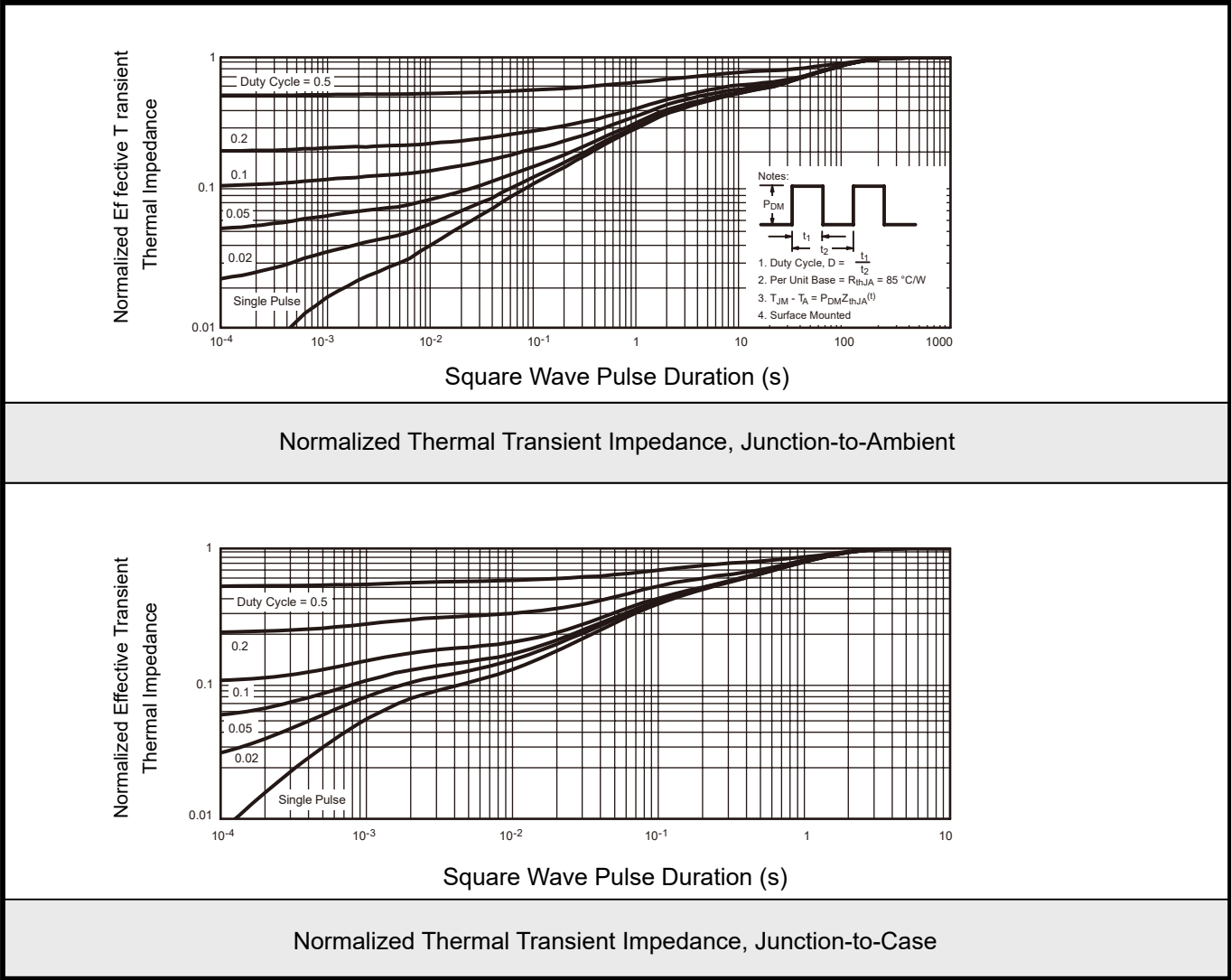
7.3Typical Characterisitics



* The power dissipation P_D is based on $T_{J(max)} = 150\text{ }^{\circ}\text{C}$, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

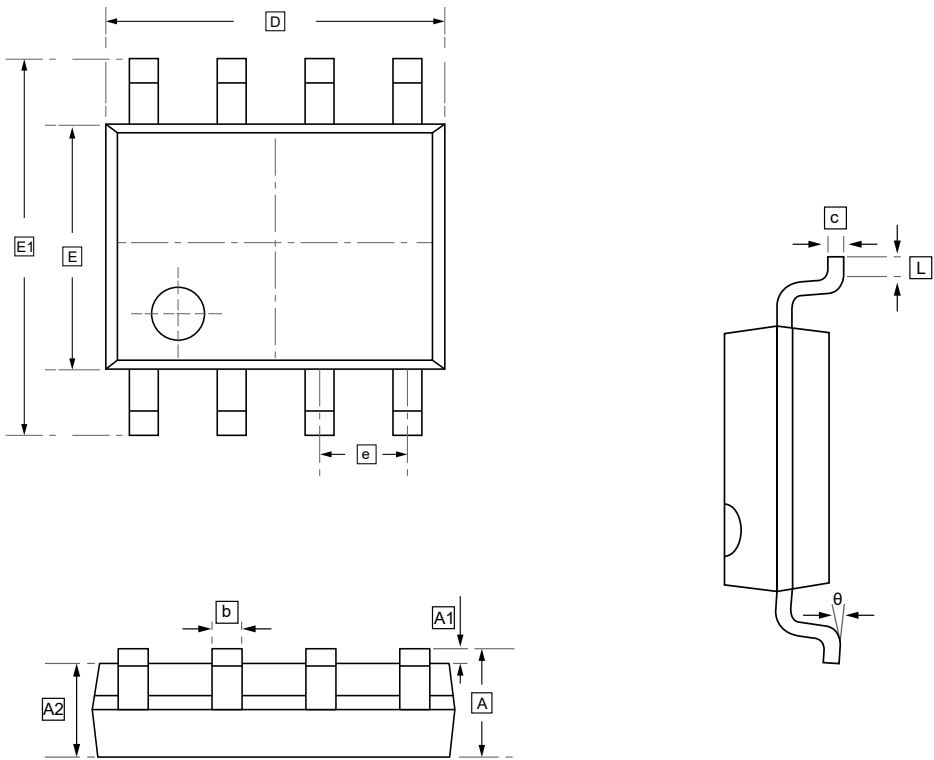


7.4Typical Characterisitics





8.SOP-8 Package Outline Dimensions

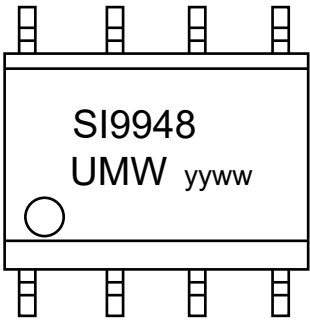


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°



9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW SI9948AEY	SOP-8	3000	Tape and reel



10.Disclaimer

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