Descriptions

This is 650V 8.5A N-Channel Super-Junction Power MOSFETF.

Features

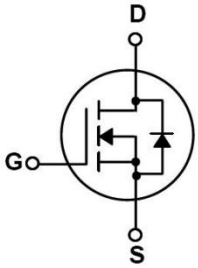
- Low $R_{DS(on)}$
- low gate charge
- low C_{rss}
- fast switching
- HF Product

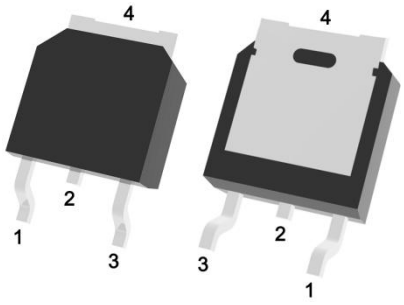
Parameter	Value	Unit
V_{DS}	650	V
I_D	8.5	A
$R_{DS(ON)(max)}$@10V	650	mΩ

Applications

- Automotive
- DC/DC Converters
- High efficiency switching for power management in portable and battery operated products

Equivalent Circuit & Pinning





TO-252 PIN1： G PIN 2： D PIN 3： S PIN 4： D

Absolute Maximum Ratings(Ta=25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	650	V
Drain Current	I_D(Tc=25℃)	8.5	A
Drain Current - Pulsed	I_{DM}	34	A
Gate-Source Voltage	V_{GS}	±30	V
Single Pulsed Avalanche Energy	E_{AS}	86.7	mJ
Avalanche Current	I_{AS}	4	A
Power Dissipation	P_D(Tc=25℃)	104	W
Operating and Storage Temperature Range	T_J,T_{STG}	-55 to 150	℃
Junction-to-Case	$R_{\theta JC}$	1.2	℃/W
Junction-to-Ambient	$R_{\theta JA}$	55	℃/W

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V V_{GS}=0V T_J=25℃			1.0	μA
Gate-Body Leakage Current, Forward	I_{GSS}	V_{GS}=±30V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	2.5		4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V I_D=3.5A		580	650	mΩ
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V I_{SD}=1A T_J=25℃			1.2	V
Gate Resistance	R_g	V_{GS} = 0V f = 1.0MHz		14.3		Ω
Input Capacitance	C_{iss}	V_{DS}=100V V_{GS}=0V f=1.0MHz		308		pF
Output Capacitance	C_{oss}			560		pF
Reverse Transfer Capacitance	C_{rss}			9.8		pF
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=400V I_D=3.5A V_{GS}=10V R_G=25Ω		33.9		ns
Turn-On Rise Time	t_r			23.4		ns
Turn-Off Delay Time	$t_{d(off)}$			50.3		ns
Turn-Off Fall Time	t_f			20.3		ns

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Diode Forward Current	I_S				8.5	A
Total Gate Charge	Q_g	V_{DS}=520V I_D=3.5A V_{GS}=10V		11.5		nC
Gate-Source Charge	Q_{gs}			2.7		nC
Gate-Drain Charge	Q_{gd}			2.1		nC
Reverse recovery time	T_{rr}	V_R=50 V, I_F=3.5A, dI_F/dt=100 A/μs		174		ns
Reverse recovery charge	Q_{rr}			1.3		uC

Electrical Characteristic Curve

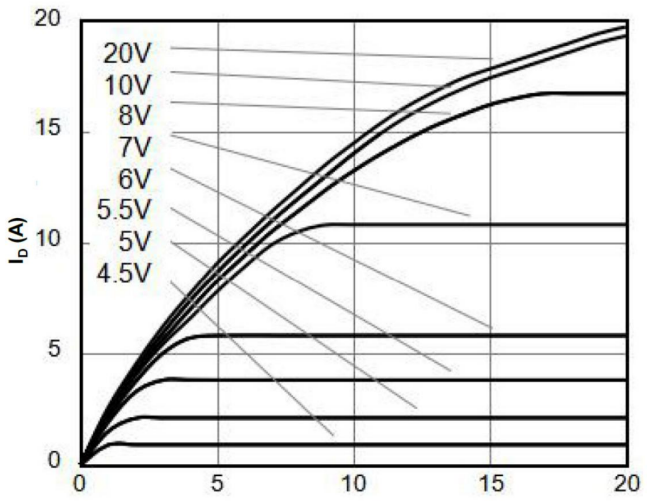


Figure 1: On-Region Characteristics

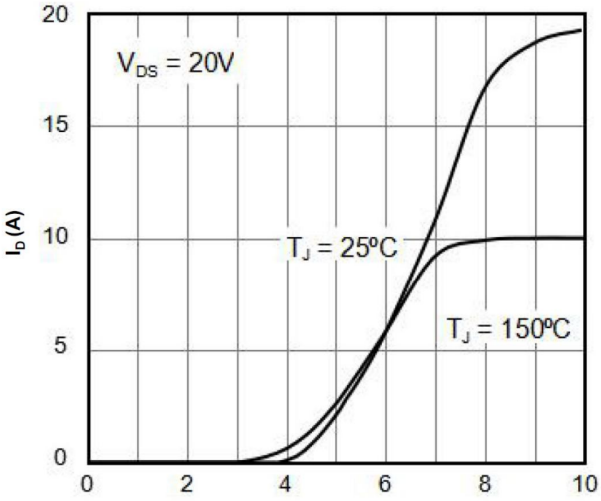


Figure 2: Transfer Characteristics

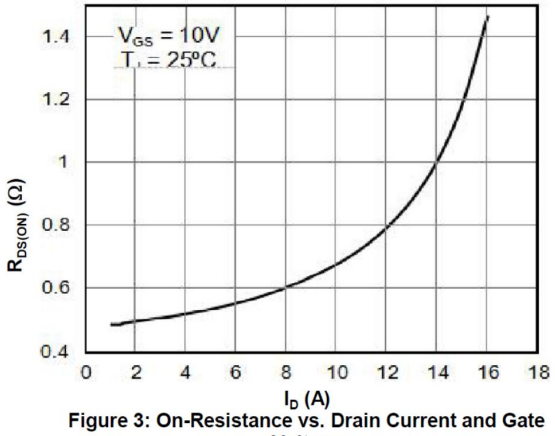


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

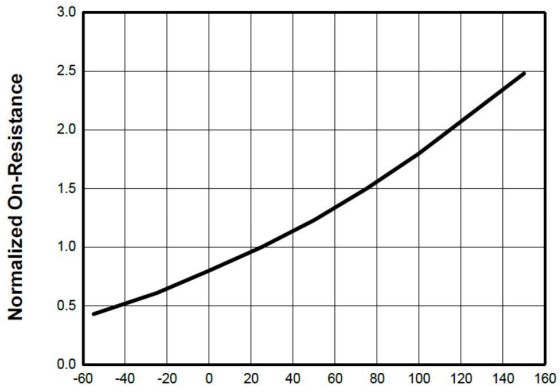


Figure 4: On-Resistance vs. Junction Temperature

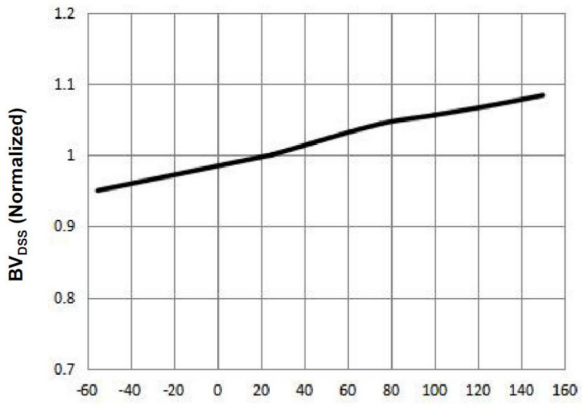


Figure 5: Break Down vs. Junction Temparature

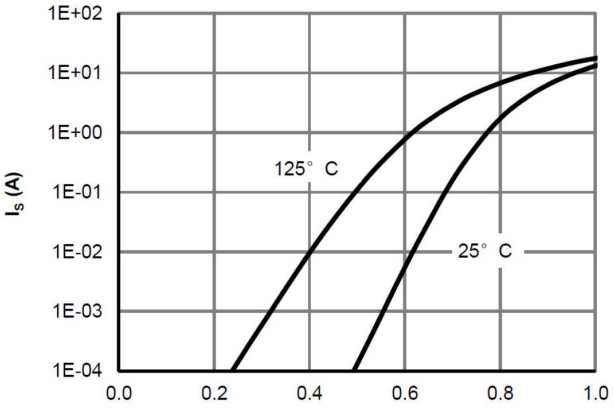


Figure 6: Body-Diode Characteristics

Electrical Characteristic Curve

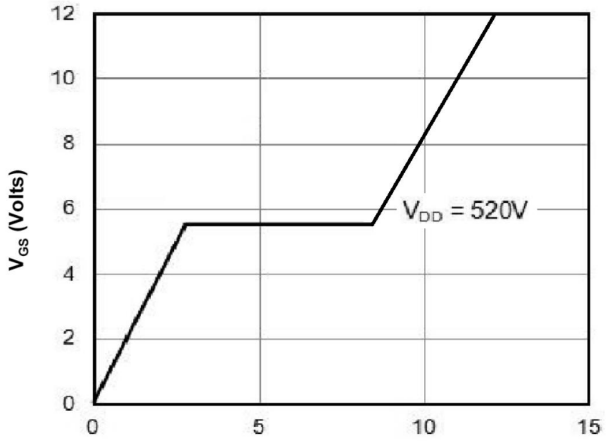


Figure 7: Gate-Charge Characteristics

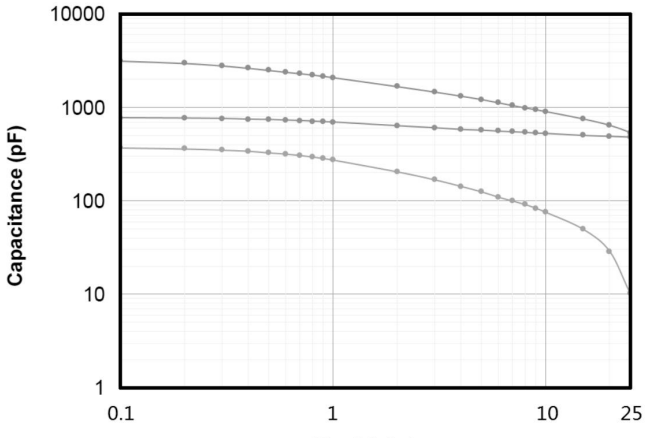


Figure 8: Capacitance Characteristics

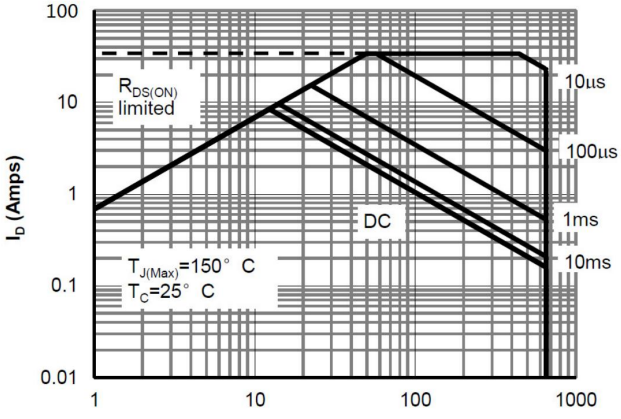


Figure 9 : Maximum Forward Biased Safe Operating Area

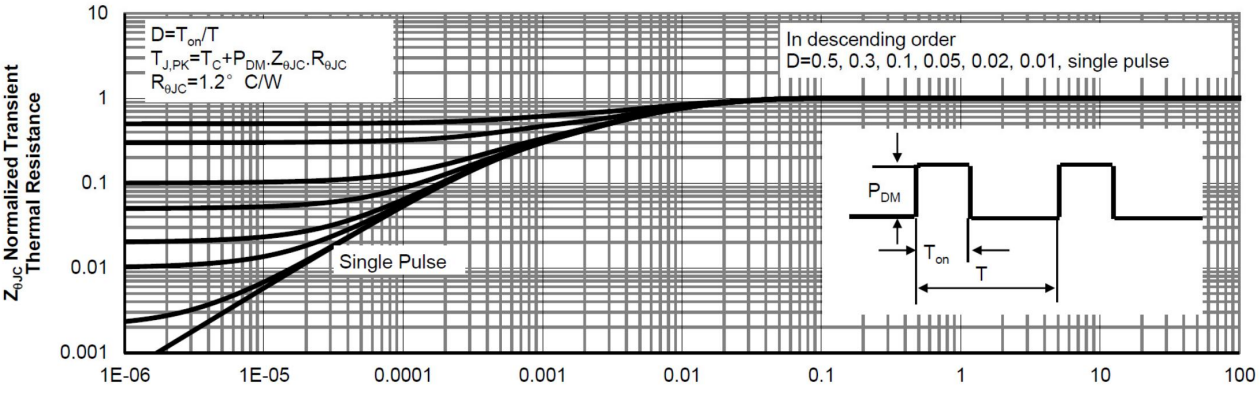
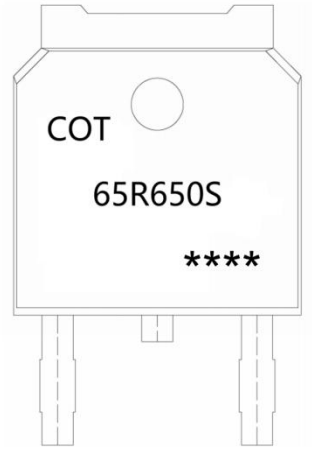


Figure 10: Normalized Maximum Transient Thermal Impedance

Marking Instructions



Note:

COT:	Company Code
65R650S:	Product Type Code
****:	Lot No. Code, code change with Lot No.

Packaging SPEC

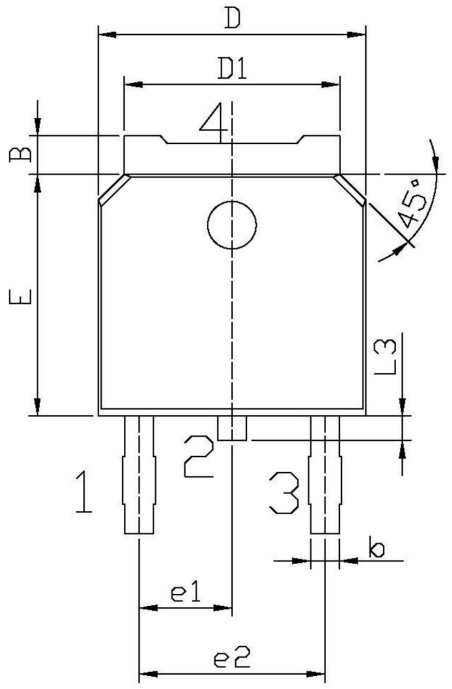
REEL

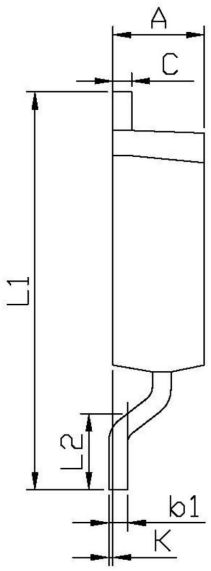
Package Type	Units					Dimension (unit：mm³)		
	Units/Reel	Reels/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Reel	Inner Box	Outer Box
TO-252	2,500	2	5,000	6	30,000	13″ ×16	360×360×50	380×335×366

TUBE

Package Type	Units					Dimension (unit：mm³)		
	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Tube	Inner Box	Outer Box
TO-252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

Package Outline Dimensions





单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.70	2.00
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	K	0.00	0.10

TO-252