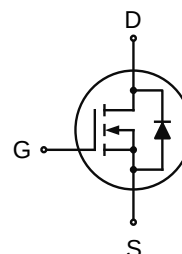


TPC65R360M

Super-Junction Power Mosfet

Features

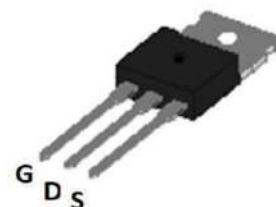
- 650V, 11A
 $R_{DS(ON)} < 360m\Omega @ V_{GS}=10V$ TYP: 280mΩ
- advanced super junction technology
- extremely low on resistance



Schematic Diagram

Applications

- Power faction correction (PFC)
- Switched mode power supplies (SMPS)
- Uninterruptible power supply (UPS)
- LED lighting powe



TO-220

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
C65R360M	TPC65R360M	TO-220	-	-	1000

ABSOLUTE MAXIMUM RATINGS ($T_a=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current ($T_c=25^{\circ}C$)	I_D	11	A
Continuous Drain Current ($T_c=100^{\circ}C$)	I_D	7	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	33	A
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	80	mJ
Drain Power Dissipation	P_D	23	W
MOSFET dv/dt ruggedness	dv/dt	130	V/ns
Reverse diode dv/dt		33	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	5.4	$^{\circ}C/W$
Thermal Resistance- Junction to Ambient	$R_{\theta JA}$	55	$^{\circ}C/W$
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}C$

MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	650	-	-	V
		V _{GS} = 0V, I _D =250μA T _j =150℃	700			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =650V, V _{GS} = 0V	-	-	1	uA
		V _{DS} =650V, V _{GS} = 0V T _j =150℃			100	uA
Gate-body leakage current	I _{GSS}	V _{GS} =± 30V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.5	3.5	4.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =5.5A	-	280	360	mΩ
Dynamic characteristics						
Input Capacitance	C _{iSS}	V _{DS} =100V, V _{GS} =0V, f =1.0MHz	-	841	-	pF
Output Capacitance	C _{oSS}		-	45.1	-	
Reverse Transfer Capacitance	C _{rSS}		-	2.8	-	
Gate Resistance	R _g	f =1.0MHz		5		Ω
Switching characteristics ^(3,4)						
Turn-on delay time	t _{d(on)}	V _{DD} =520V, I _D =5.5A, R _G =25Ω, V _G =10V	-	18.2	-	ns
Turn-on rise time	t _r		-	25.8	-	
Turn-off delay time	t _{d(off)}		-	81.8	-	
Turn-off fall time	t _f		-	26.8	-	
Total Gate Charge	Q _g	V _{DS} =520V, I _D =5.5A, V _{GS} =10V	-	23.3	-	nC
Gate-Source Charge	Q _{gs}		-	5.5	-	
Gate-Drain Charge	Q _{gd}		-	9.7	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	T _c =25℃, V _{GS} =0V, I _S =5.5A	-	0.85	1.4	V
Diode Forward current	I _S	T _c =25℃	-	-	11	A
Body Diode Reverse Recovery Time ⁽³⁾	t _{rr}	T _c =25℃, IF=5.5A, di/dt=100A/us		250		ns
Body Diode Reverse Recovery Charge	Q _{rr}	T _c =25℃, IF=5.5A, di/dt=100A/us		2.55		uc

Notes:

1. Pulse width limited by maximum junction temperature
2. $L=10\text{mH}$, $I_{AS}=4A$, $V_{DD}=150V$, $V_G=10V$, $R_G=25\Omega$, starting $T_J=25^{\circ}\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
4. Essentially independent of operating temperature

Typical Performance Characteristics

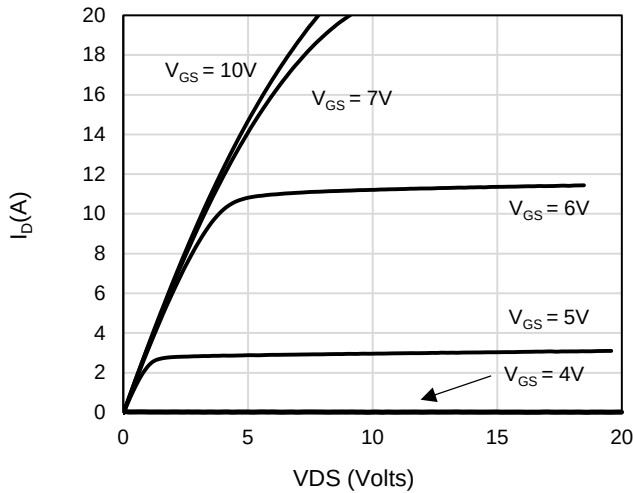


Figure 1: On-Region Characteristics

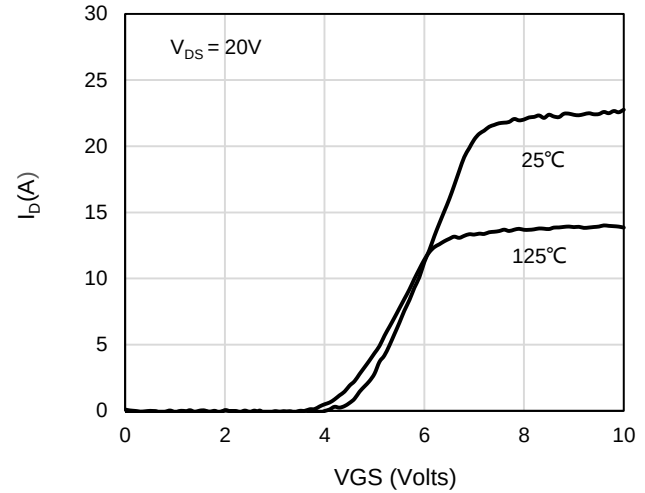


Figure 2: Transfer Characteristics

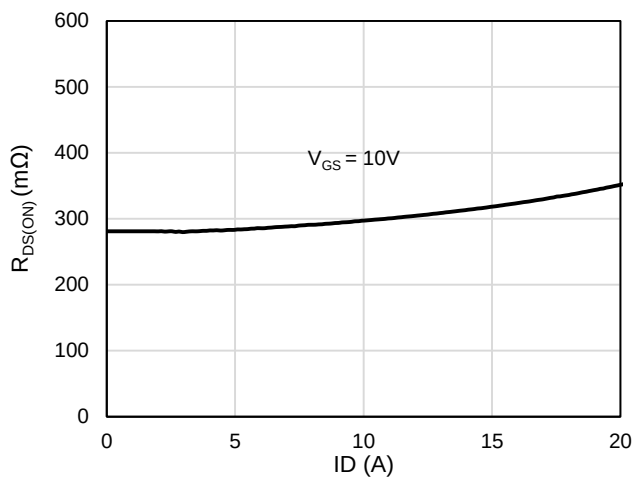


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

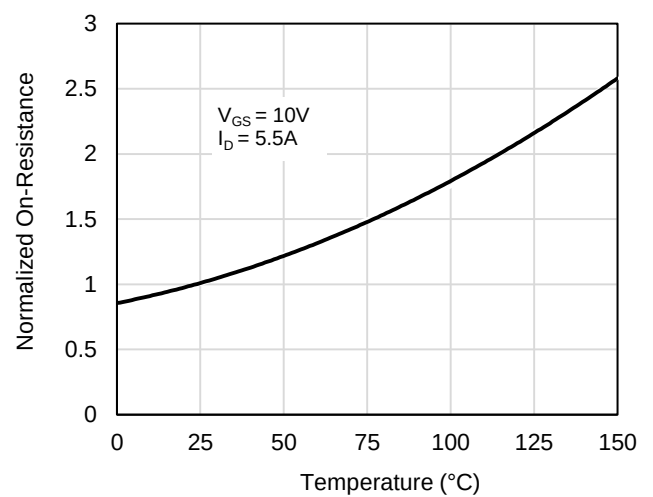


Figure 4: On-Resistance vs. Junction Temperature

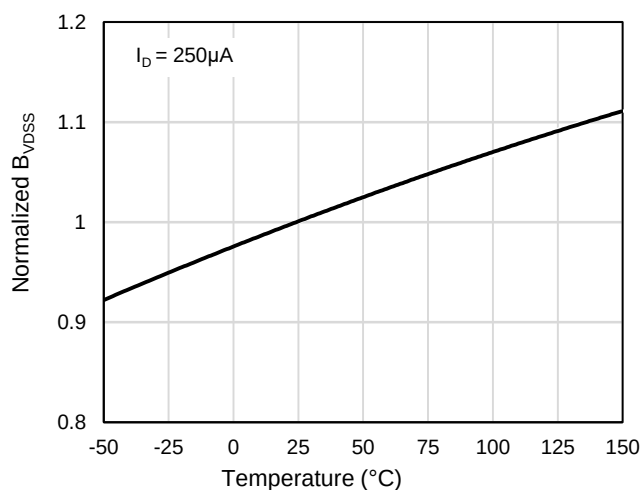


Figure 5: Breakdown Voltage vs. Junction Temperature

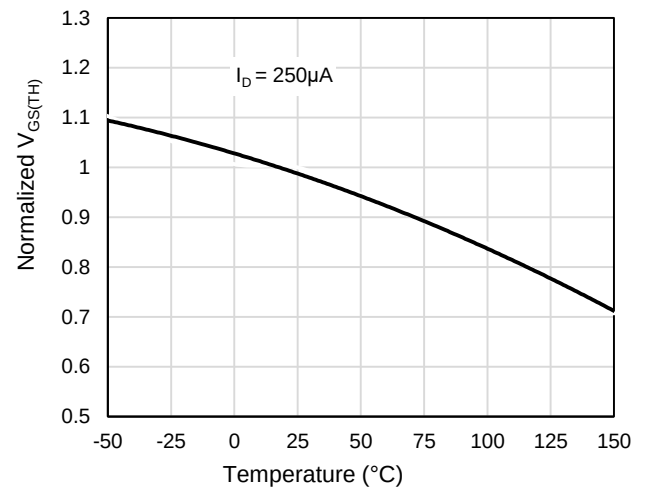


Figure 6: Threshold Voltage vs. Junction Temperature

Typical Performance Characteristics

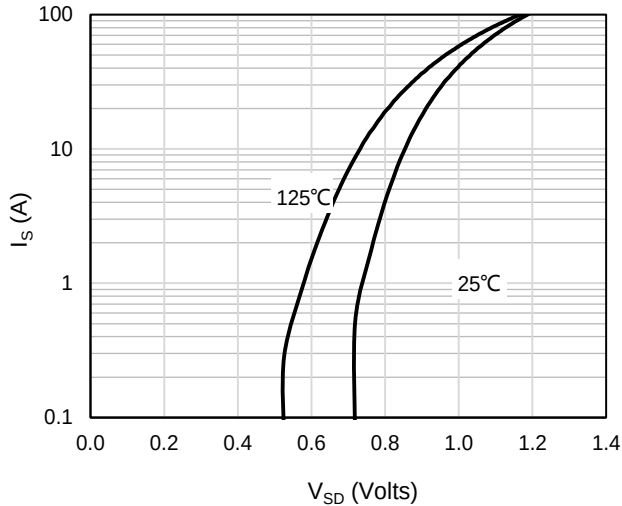


Figure 7: Body-Diode Characteristics

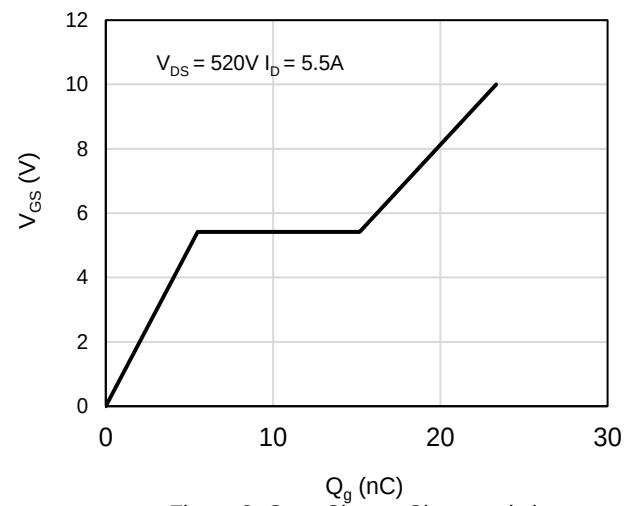


Figure 8: Gate-Charge Characteristics

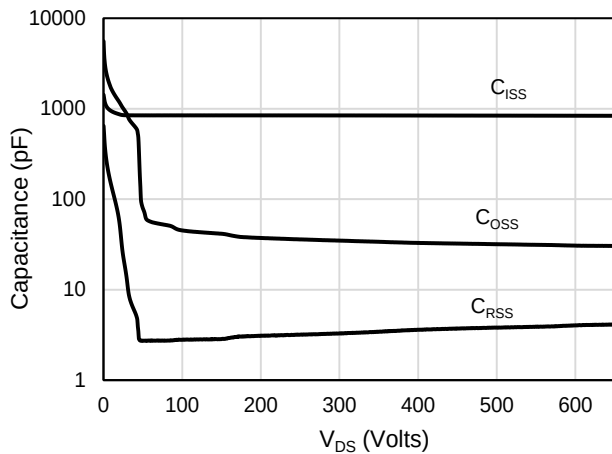


Figure 9: Capacitance Characteristics

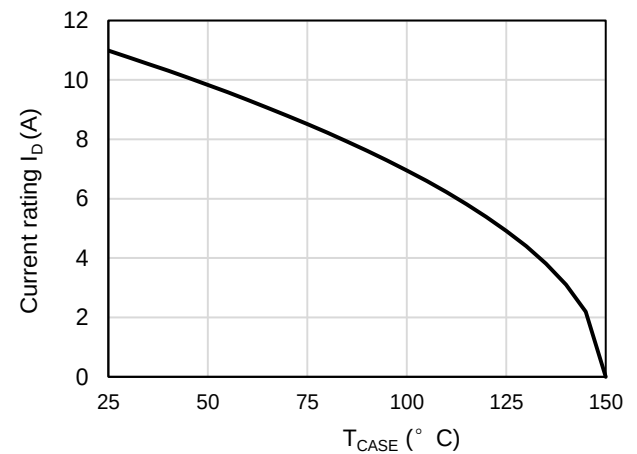


Figure 10: Current De-rating^(Note 1)

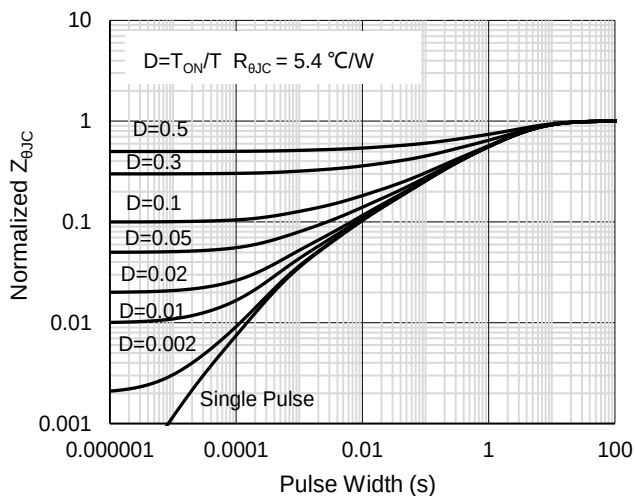


Figure 11: Normalized Maximum Transient Thermal Impedance

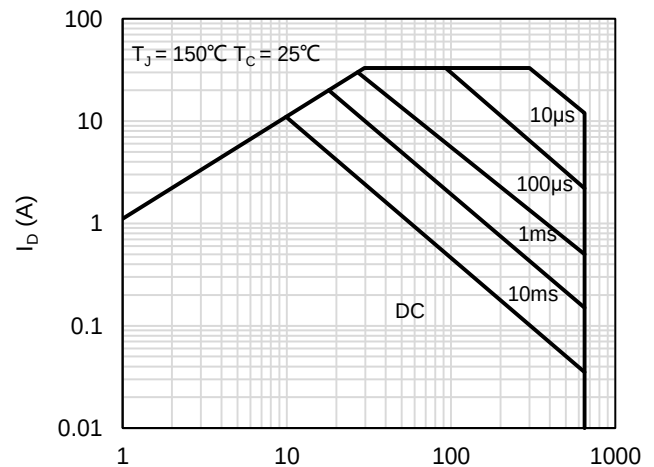
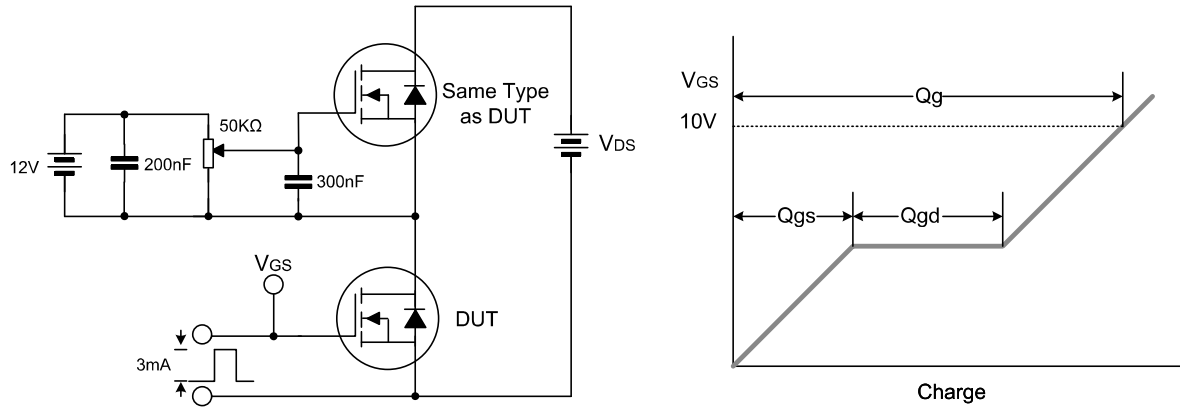


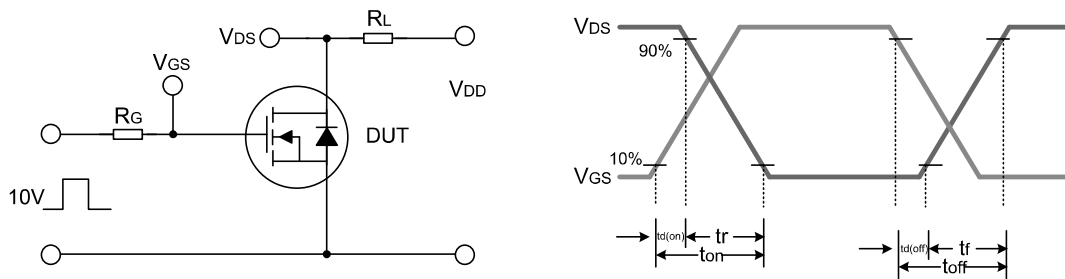
Figure 12: Maximum Forward Biased Safe Operating Area

Test Circuit

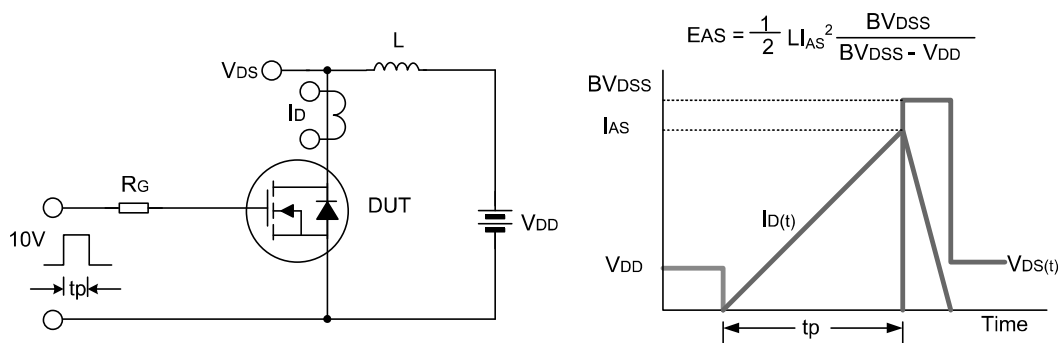
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



Package Dimensions of TO-220

Unit:mm

